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Norfolk Vanguard Offshore Wind Farm

Habitats Regulations Assessment - Screening Matrices (Updated)

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1 SCREENING MATRICES

1.1 Introduction

1. This document provides the updated Habitats Regulations Assessment (HRA) screening matrices for Norfolk Vanguard Offshore Wind Farm. The matrices summarise the information provided in Appendix 5.1 (Offshore Habitats Regulations Assessment (HRA) Screening) of the Information to Support HRA report (document 5.3 of the application).

2. The following European sites have been included in the screening matrices in response to advice received from the French Agency for Biodiversity during the Norfolk Vanguard Examination:

   - Bancs Des Flandres Special Protection Area (SPA), and
   - Cap Gris Nez SPA.

3. The screening matrices for the following European sites have been updated in response to advice received from Natural England during the Norfolk Vanguard Examination

   - Breydon Water SPA and Ramsar,
   - Broadland SPA and Ramsar,
   - Flamborough and Filey Coast potential Special Protection Area (pSPA),
   - North Norfolk Coast SPA and Ramsar, and
   - Outer Thames Estuary SPA and pSPA extension

1.2 Effects Considered

4. Potential effects upon the European sites which are considered within the submitted Information to Support HRA report are provided in Table 1.1.

Table 1.1 Potential Effects consider in Screening

Site Type	Feature(s)	Potential Effects
Special Protection Area (SPA)	All birds	Offshore effects • Collision mortality • Displacement/Disturbance • Barrier effect • Cumulative/ In-combination Onshore effects • Direct effects within SPA boundary • Direct effects on ex-situ habitats • Indirect effects within SPA boundary • Indirect effects on ex-situ habitats
Special Area of Conservation/Site	Benthic habitats	• Permanent loss (and introduction of new sediment where applicable) • Temporary physical disturbance • Smothering due to increased suspended sediment

Site Type	Feature(s)	Potential Effects
of Community Importance (SAC/SCI)		• Re- mobilisation of contaminated sediments • Underwater noise and vibration • Cumulative/ In-combination
	Marine mammals	• Underwater noise • Vessel Interactions • Indirect effects on prey • Changes to water quality • Cumulative/ In-combination
	Fish	• Permanent loss (and introduction of new sediment where applicable) • Temporary physical disturbance • Smothering due to increased suspended sediment • Re- mobilisation of contaminated sediments • Underwater noise and vibration • Electromagnetic fields (EMF) • Cumulative/ In-combination
	Terrestrial	• Direct effects (e.g. habitat loss) • Impacts on ex-situ habitats functionally connected to the SAC • Impacts from alterations to geology and land contamination • Disturbance due to groundwater / hydrology changes • Impacts from noise disturbance • Impacts from changing air quality • Impacts from light disturbance • Impacts from visual disturbance

1.3 Sites Considered

5. The methodology for screening of sites and effects is discussed in Appendix 5.1 of the Information to Support HRA report.

6. The following sites were included in the Screening stage.

Norfolk Vanguard Reference Number	Designated site	Ornithology	Marine Mammals	Benthic Habitats	Fish	Terrestrial
1	Abberton Reservoir SPA & Ramsar	✓				
2	Abers - Côtes des légendes SAC		✓			
3	Alde, Ore and Butley Estuaries SAC			✓		
4	Alde-Ore Estuary SPA & Ramsar	✓				
5	Archipel des Glénan SAC		✓			
6	Baie De Canche Et Couloir Des Trois Estuaires SCI		✓		✓	
7	Baie de Morlaix SAC		✓			
8	Baie de Seine Occidentale SCI		✓			
9	Baie de Seine Occidentale SPA	✓				
10	Baie de Seine Orientale SAC	✓				
11	Bancs Des Flandres SAC		✓	✓		
12	Bancs Des Flandres SPA	✓				

Norfolk Vanguard Reference Number	Designated site	Ornithology	Marine Mammals	Benthic Habitats	Fish	Terrestrial
13	Bassurelle Sandbank SCI			✓		
14	Benfleet and Southend Marshes SPA & Ramsar	✓				
15	Berwickshire and North Northumberland Coast SAC		✓	✓		
16	Blackwater Estuary (Mid-Essex Coast Phase 4) SPA & Ramsar	✓				
17	Borkum-Riffgrund SCI		✓		✓	
18	Borkum-Riffgrund SPA	✓				
19	Braemar Pockmarks SAC			✓		
20	Breydon Water SPA & Ramsar	✓				
21	Broadland SPA & Ramsar	✓				
22	Bruine Bank pSPA	✓				
23	Buchan Ness to Collieston Coast SPA	✓				
24	Calf of Eday SPA	✓				
25	Cap Sizun SAC		✓			
26	Cap Gris Nez SPA	✓				
27	Chausey SCI	✓				
28	Chesil Beach and The Fleet SPA & Ramsar	✓				
29	Chichester and Langstone Harbours SPA & Ramsar	✓				
30	Colne Estuary (Mid-Essex Coast Phase 2) SPA & Ramsar	✓				
31	Copinsay SPA	✓				
32	Coquet Island SPA	✓				
33	Côte de Granit Rose-Sept Iles SAC	✓				
34	Cromarty Firth SPA & Ramsar	✓				
35	Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA & Ramsar	✓				
36	Deben Estuary SPA & Ramsar	✓				
37	Dengie (Mid-Essex Coast Phase 1) SPA & Ramsar	✓				
38	Doggerbank SCI		✓			
39	Doggersbank SCI		✓			
40	Dornoch Firth and Loch Fleet SPA & Ramsar	✓				
41	Dünenlandschaft Süd-Sylt SAC		✓			
42	Dunes De La Plaine Maritime Flamande SAC		✓	✓		
43	East Caithness Cliffs SPA	✓				
44	Essex Estuaries SAC			✓		
45	Estuaire de la Canche, dunes picardes plaquées sur l'ancienne falaise, forêt d'Hardelot et falaise d'Equihen SCI		✓			

Norfolk Vanguard Reference Number	Designated site	Ornithology	Marine Mammals	Benthic Habitats	Fish	Terrestrial
46	Estuaire de la Seine SCI		✓			
47	Estuaires Et Littoral Picards SAC		✓		✓	
48	Exe Estuary SPA & Ramsar	✓				
49	Fair Isle SPA	✓				
50	Falaise du Bessin Occidental SPA	✓				
51	Falaises Du Cran Aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant SCI		✓	✓		
52	Falaises et Pelouses du Cap Blanc Nez, du Mont d'Hubert, des Noires Mottes, du Fond de la Forge et du Mont de couple SCI			✓		
53	Faray and Holm of Faray SAC		✓			
54	Farne Islands SPA	✓				
55	Fetlar SPA	✓				
56	Firth of Forth SPA & Ramsar	✓				
57	Firth of Tay & Eden Estuary SPA & Ramsar	✓				
58	Flamborough and Filey Coast pSPA	✓				
59	Flamborough Head SAC			✓		
60	Forth Islands SPA	✓				
61	Foula SPA	✓				
62	Foulness (Mid-Essex Coast Phase 5) SPA & Ramsar	✓				
63	Fowlsheugh SPA	✓				
64	Frisian Front pSPA	✓				
65	Gibraltar Point SPA & Ramsar	✓				
66	Great Yarmouth North Denes SPA	✓				
67	Greater Wash pSPA	✓				
68	Gule Rev SCI		✓			
69	Haisborough, Hammond and Winterton SAC			✓		
70	Hamburgisches Wattenmeer SCI		✓			
71	Hamford Water SPA & Ramsar	✓				
72	Helgoland mit Helgoländer Felssockel SAC		✓			
73	Hermaness, Saxa Vord and Valla Field SPA	✓				
74	Hornsea Mere SPA	✓				
75	Hoy SPA	✓				
76	Humber Estuary SAC		✓	✓	✓	
77	Humber Estuary SPA & Ramsar	✓				
78	Hund und Paapsand SCI		✓			
79	Imperial Dock Lock, Leith SPA	✓				
80	Inner Dowsing, Race Bank and North Ridge SCI			✓		
81	Inner Moray Firth SPA & Ramsar	✓				

Norfolk Vanguard Reference Number	Designated site	Ornithology	Marine Mammals	Benthic Habitats	Fish	Terrestrial
82	Isle of May SAC		✓			
83	Klaverbank SCI		✓			
84	Knudegrund SAC		✓			
85	Kosterfjorden-Väderöfjorden SAC		✓			
86	Küsten- und Dünenlandschaften Amrums SAC		✓			
87	Lindisfarne SPA & Ramsar	✓				
88	Littoral Cauchois SAC		✓			
89	Littoral Seino-Marin SPA	✓				
90	Loch of Strathbeg SPA & Ramsar	✓				
91	LØnstrup RØdgrund SAC		✓			
92	Margate and Long Sands SCI			✓		
93	Marwick Head SPA	✓				
94	Medway Estuary and Marshes SPA & Ramsar	✓				
95	Minsmere-Walberswick SPA & Ramsar	✓				
96	Montrose Basin SPA & Ramsar	✓				
97	Moray and Nairn Coast SPA & Ramsar	✓				
98	Mousa SPA	✓				
99	Muhlenberger Loch/Nesssand SCI		✓			
100	Nationalpark Niedersächsisches Wattenmeer SCI		✓			
101	Noordzeekustzone SAC		✓	✓	✓	
102	Norfolk Valley Fens SAC					✓
103	North Caithness Cliffs SPA	✓				
104	North Norfolk Coast SPA & Ramsar	✓				
105	North Norfolk Sandbanks and Saturn Reef SAC			✓		
106	Northumbria Coast SPA & Ramsar	✓				
107	Noss SPA	✓				
108	NTP S-H Wattenmeer und angrenzende Küstengebiete SAC		✓			
109	Oosterschelde SAC		✓			
110	Orfordness - Shingle Street SAC			✓		
111	Östliche Deutsche Bucht SPA	✓				
112	Ouessant-Molène SAC		✓			
113	Outer Thames Estuary SPA	✓				
114	Panache De La Gironde Et Plateau Rocheux De Cordouan SAC		✓			
115	Papa Stour SPA	✓				
116	Papa Westray (North Hill and Holm) SPA	✓				
117	Paston Great Barn SAC					✓
118	Pentland Firth Islands SPA	✓				
119	Pertuis Charentais SAC		✓			

Norfolk Vanguard Reference Number	Designated site	Ornithology	Marine Mammals	Benthic Habitats	Fish	Terrestrial
120	Portsmouth Harbour SPA & Ramsar	✓				
121	Presqu'ile De Crozon SAC		✓			
122	Ramsar-Gebiet S-H Wattenmeer und angrenzende Küstengebiete SPA	✓				
123	Récifs Gris-Nez Blanc-Nez SCI		✓	✓		
124	Ridens et dunes hydrauliques du détroit du Pas-de-Calais SCI		✓	✓		
125	River Derwent SAC				✓	
126	River Wensum SAC					✓
127	Ronas Hill - North Roe and Tingon SPA	✓				
128	Rousay SPA	✓				
129	Sandbanker ud for Thorsminde SAC		✓			
130	Sandbanker ud for Thyboron SAC		✓			
131	SBZ 1 / ZPS 1 SAC		✓			
132	SBZ 2 / ZPS 2 SAC		✓			
133	SBZ 3 / ZPS 3 SAC		✓			
134	Scanner Pockmark SAC			✓		
135	Schleswig-Holsteinisches Elbastuar und angrenzende Flachen SAC		✓			
136	Seevogelschutzgebiet Helgoland SPA	✓				
137	Skagens Gren og Skagerrak SAC		✓			
138	Solent and Southampton Water SPA & Ramsar	✓				
139	Southern North Sea cSAC		✓			
140	St Abb`s Head to Fast Castle SPA	✓				
141	Steingrund SAC		✓			
142	Store Rev SCI		✓			
143	Stour and Orwell Estuaries SPA & Ramsar	✓				
144	Sumburgh Head SPA	✓				
145	Sydlige Nordsø SAC		✓			
146	Sylter Außenriff SCI	✓				
147	Teesmouth and Cleveland Coast SPA & Ramsar	✓				
148	Thames Estuary and Marshes SPA & Ramsar	✓				
149	Thanet Coast and Sandwich Bay SPA & Ramsar	✓				
150	Thanet Coast SAC			✓		
151	The Broads SAC					✓
152	The Swale SPA & Ramsar	✓				

Norfolk Vanguard Reference Number	Designated site	Ornithology	Marine Mammals	Benthic Habitats	Fish	Terrestrial
153	The Wash and North Norfolk Coast SAC		✓	✓		
154	The Wash SPA & Ramsar	✓				
155	Thyboron Stenvolde SCI		✓			
156	Tregor Goëlo SAC		✓			
157	Troup, Pennan and Lion`s Heads SPA	✓				
158	Unterelbe SCI		✓			
159	Unterems und Außenems SCI		✓			
160	Vadehavet med Ribe Å, Tved Å og Varde Å vest for Varde SAC		✓			
161	Vlaamse Banken SAC		✓	✓	✓	
162	Vlakte van de Raan SCI/SAC		✓		✓	
163	Voordelta SAC and SPA	✓	✓	✓	✓	
164	Waddenzee SPA	✓				
165	Waddenzee SAC		✓	✓		
166	West Westray SPA	✓				
167	Westerschelde & Saeftinghe SAC		✓		✓	
168	Ythan Estuary, Sands of Forvie and Meikle Loch SPA	✓				

1.4 Key to effects

7. A summary of the evidence presented in the determination of the risk of likely significant effects (LSE) on the relevant qualifying features of a site is detailed within the footnotes to the screening matrices below.

8. The following abbreviations are used within the screening matrices:
   - Y = LSE **cannot** be excluded
   - N = LSE **can** be excluded
   - C = construction
   - O = operation
   - D = decommissioning

9. Where effects are not applicable to a particular feature they are greyed out.

Site	**1**											
Name of European Site:	**Abberton Reservoir SPA and Ramsar**											
Distance to Norfolk Vanguard (km)	**150**											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features shoveler *Anas clypeata*, teal *Anas crecca*, wigeon *Mareca penelope*, gadwall *Mareca strepera*, pochard *Mareca strepera*, tufted duck *Aythya fuligula*, goldeneye *Bucephala clangula*, mute swan *Cygnus olor*, coot *Fulica atra*, great crested grebe *Podiceps cristatus*		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding cormorant *Phalacrocorax carbo*		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show no evidence of the SPA features found at that site occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Maximum foraging range of breeding cormorants from their colonies is 35km (Thaxter et al. 2012); the Norfolk Vanguard site is therefore located far beyond the maximum range and so has no breeding season connectivity. It is extremely unlikely that cormorants from Abberton Reservoir SPA would visit the Norfolk Vanguard site in the nonbreeding season as they mostly overwinter in freshwater habitat in southern England.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Abberton Reservoir SPA and Ramsar.

Site	2														
Name of European Site:	Abers - Côtes Des Legendes SAC														
Distance to Norfolk Vanguard (km)	667														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal *Halichoerus grypus*	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	3																	
Name of European Site:	Alde, Ore and Butley Estuaries SAC																	
Distance to Norfolk Vanguard (km)	68																	
Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Offshore habitats																		
Mudflats and sandflats not covered by seawater at low tide	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)
Estuaries	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)

(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	**4**											
Name of European Site:	**Alde-Ore Estuary SPA and Ramsar**											
Distance to Norfolk Vanguard (km)	**92**											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding lesser black-backed gulls *Larus fuscus*		**Y (a)**		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (h)	**Y (a)**	N (h)
Breeding marsh harrier *Circus aeruginosus*		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (h)	N (h)	N (h)
Breeding avocet *Recurvirostra avosetta*		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (h)	N (h)	N (h)
Breeding little tern *Sternula albifrons*		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)
Breeding Sandwich tern *Sterna sandvicensis*		N (f)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (h)	N (h)	N (h)
Nonbreeding ruff *Philomachus pugnax*, avocet, redshank *Tringa totanus*		N (g)		N (g)	N (g)	N (g)	N (g)	N (g)	N (g)	N (h)	N (h)	N (h)

(a) Model predictions of collision mortality indicate that LSE cannot be ruled out at screening and so requires further consideration.
(b) Evidence indicates that lesser black-backed gulls are not affected by displacement, disturbance or barrier effects at offshore wind farms.
(c) Marsh harrier is a migrant species. Satellite tracking suggests that marsh harriers migrate overland to the south coast of England and over the Channel to France, rather than across the North Sea.
(d) Avocet has not been observed in the Norfolk Vanguard site during bird surveys. It is highly unlikely that avocets from this SPA will migrate through the Norfolk Vanguard site, and if they did, their flight height is likely not to be at collision risk height.
(e) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with the Norfolk Vanguard site. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.
(f) Breeding Sandwich tern has a maximum foraging range of 54km from colonies, so would have no connectivity with the Norfolk Vanguard site. Only very small numbers of terns of any species were observed in the Norfolk Vanguard site in surveys. Migrating Sandwich terns from this SPA population will form a very small fraction of the very small total numbers of terns passing the site on passage.
(g) Ruff, avocet and redshank have not been observed during bird surveys at the Norfolk Vanguard site. It is highly unlikely that these birds would migrate through the Norfolk Vanguard site as their migration is likely to take a coastal route and cross sea at narrow points such as The English Channel. If they did migrate through the Norfolk Vanguard site their flight height is likely not to be at collision risk height.

Site	**4**
Name of European Site:	**Alde-Ore Estuary SPA and Ramsar**
Distance to Norfolk Vanguard (km)	**92**

(h) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Alde-Ore Estuary SPA and Ramsar.

Site	**5**
Name of European Site:	**Archipel des Glénan SAC**
Distance to Norfolk Vanguard (km)	**713**

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	6
Name of European Site:	Baie de Canche et couloir des trois estuaires SAC
Distance to Norfolk Vanguard (km)	254

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise *Phocoena phocoena*	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Harbour (common) seal *Phoca vitulina*	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Grey seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

Fish

Site Features	Likely effect(s) of Norfolk Vanguard																				
	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Salmon *Salmo salar*	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)

Site Features	Likely effect(s) of Norfolk Vanguard

Site	6
Name of European Site:	Baie de Canche et couloir des trois estuaires SAC
Distance to Norfolk Vanguard (km)	254

	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	C	O	C	O	C	O	D	C	O	D	C	O	D	C	O	D
Sea lamprey *Petromyzon marinus*	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)
River lamprey *Lampetra fluviatilis*	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)
Allis shad *Alosa alosa*	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	7														
Name of European Site:	Baie De Morlaix SAC														
Distance to Norfolk Vanguard (km)	622														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	8														
Name of European Site:	Baie de Seine Occidentale SAC														
Distance to Norfolk Vanguard (km)	429														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	9											
Name of European Site:	Baie de Seine Occidentale SPA											
Distance to Norfolk Vanguard (km)	429											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding, wintering and passage waterbirds		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Baie de Seine Occidentale SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site, as most migrant waterfowl moving between northern breeding areas and southern wintering areas and using staging areas such as Baie de Seine Occidentale in France pass along the west European flyway along the continental coast rather than crossing the North Sea to the UK. At a distance of 429km, the chances of birds from this SPA moving through the Norfolk Vanguard site are extremely small.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Baie de Seine Occidentale SPA.

Site Name of European Site: Distance to Norfolk Vanguard (km)	10 Baie de Seine Orientale SAC 408														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	11
Name of European Site:	Bancs des Flandres SAC
Distance to Norfolk Vanguard (km)	162

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard															
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination			
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	

Benthic Habitats

Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	12											
Name of European Site:	Banc Des Flandres SPA											
Distance to Norfolk Vanguard (km)	162											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage species: razorbill, brent goose, great skua, black tern, fulmar, red-throated diver, black-throated diver, Mediterranean gull, little gull, velvet scoter, common scoter, red-breasted merganser, gannet, Leach's storm petrel, great crested grebe, red-necked grebe, kittiwake, common eider, Arctic skua, omarine skua, common tern, little tern, Sandwich tern, Arctic tern, guillemot		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Breeding little tern		N(c)		N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(b)	N(b)	N(b)

a) Many of the named species have not been recorded on the Norfolk Vanguard site and are not ones associated with offshore locations. With respect to species named as nonbreeding features of the SPA, these consist of many of the seabird species which pass through the southern North Sea and English Channel on migration. As such the potential impacts on those species recorded at Norfolk Vanguard has been assessed in terms of the wider Biologically Defined Minimum Population Scales (BDMPS) populations (see Furness 2015). The Applicant considers this to be the appropriate population scale for nonbreeding impacts on the species named at this SPA, since the majority of individuals will not be resident at the SPA but will instead pass through. Furthermore, given the relative size of the SPA population estimates for the migratory species compared with the total passage populations, the effects on the SPA populations due to Norfolk Vanguard would be negligible.

b) The predicted effect attributable to the proposed Norfolk Vanguard project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Bancs des Flandres SPA.

c) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with Norfolk Vanguard. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

Site Name of European Site:	13 Bassurelle Sandbank SAC
Distance to Norfolk Vanguard (km)	235

Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site Name of European Site: Distance to Norfolk Vanguard (km)	14 Benfleet & Southend Marshes SPA and Ramsar 182											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features brent goose *Branta bernicla*, dunlin *Calidris alpina*, knot *Calidris canutus*, ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Benfleet & Southend Marshes SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Benfleet & Southend Marshes SPA and Ramsar.

Site	15																	
Name of European Site:	Berwickshire and North Northumberland Coast SAC																	
Distance to Norfolk Vanguard (km)	368																	
Marine Mammals																		
Site Features	Likely effect(s) of Norfolk Vanguard																	
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination					
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D			
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)			
Benthic Habitats																		
Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Coastal lagoons	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Submerged or partially submerged sea caves	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site Name of European Site: Distance to Norfolk Vanguard (km)	16 Blackwater Estuary SPA and Ramsar 152											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features brent goose, dunlin, ringed plover, black-tailed godwit *Limosa limosa limosa*, grey plover		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (f)	N (f)	N (f)
Nonbreeding hen harrier *Circus cyaneus*		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (f)	N (f)	N (f)
Breeding pochard		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (f)	N (f)	N (f)
Breeding ringed plover		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (f)	N (f)	N (f)
Breeding little tern		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)

(a) Survey data show little or no evidence of Blackwater Estuary SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Survey data show no evidence of Blackwater Estuary SPA feature (hen harrier) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(c) Survey data show no evidence of Blackwater Estuary SPA feature (pochard) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(d) Survey data show no evidence of Blackwater Estuary SPA feature (ringed plover) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(e) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with the Norfolk Vanguard site. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

(f) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Blackwater Estuary SPA and Ramsar.

Site	**17**
Name of European Site:	**Borkum-Riffgrund (Borkum Reef Ground) SCI**
Distance to Norfolk Vanguard (km)	**234**

Marine mammals

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Harbour (common) seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Grey seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

Fish

Site Features	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Twaite shad *Alosa fallax*	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	18											
Name of European Site:	Borkum-Riffgrund SPA											
Distance to Norfolk Vanguard (km)	234											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding seabird assemblage including as named features black-throated diver *Gavia arctica*, red-throated diver *Gavia stellata*, common gull *Larus canus*, lesser black-backed gull, great black-backed gull *Larus marinus*, little gull *Larus minutus*, kittiwake *Rissa tridactyla*, common tern *Sterna hirundo*, Arctic tern *Sterna paradisaea*, Sandwich tern, gannet *Morus bassanus*, guillemot *Uria aalge*		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

a) Migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration relative to the size of Biologically Defined Minimum Population Scale (BDMPS) regional populations. Not only are the sites 234km apart, but much of the seasonal movement of birds avoids crossing of the North Sea so that birds on the continental side of the North Sea are more likely to move along the continental coast rather than crossing to the UK.

b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Borkum-Riffgrund SPA.

Site	19
Name of European Site:	Braemar Pockmarks SAC
Distance to Norfolk Vanguard (km)	663

Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Submarine structures made by leaking gases	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	20											
Name of European Site:	Breydon Water SPA and Ramsar											
Distance to Norfolk Vanguard (km)	53											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features Bewick's swan *Cygnus columbianus bewickii*, ruff, golden plover *Pluvialis apricaria*, avocet, lapwing *Vanellus vanellus*		**Y (a)**		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	**Y (a)**	N (b)
Breeding common tern		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (d)	N (d)	N (d)

(a) Natural England consider that there is potential for connectivity during migration and therefore LSE cannot be screened out.
(b) Survey data show no evidence of Breydon Water SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration.
(c) SPA is far beyond the maximum foraging range of common tern (30km) so has no breeding season connectivity. Numbers of SPA common tern migrating through the Norfolk Vanguard site are likely to be extremely small relative to BDMPS.
(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Breydon Water SPA and Ramsar.

Site	21											
Name of European Site:	Broadland SPA and Ramsar											
Distance to Norfolk Vanguard (km)	53 (offshore project area)											
Site Features	Likely effect(s) of Norfolk Vanguard offshore project area											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features shoveler, wigeon, gadwall, Bewick's swan, whooper swan, ruff		**Y (a)**		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (c)	**Y (a)**	N (c)

(a) Natural England consider that there is potential for connectivity during migration and therefore LSE cannot be screened out.

(b) Survey data show no evidence of Broadland SPA features occurring in the proposed Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration.

(c) The predicted effect attributable to the proposed Norfolk Vanguard project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Broadland SPA and Ramsar.

Site	21											
Name of European Site:	Broadland SPA and Ramsar											
Distance to Norfolk Vanguard (km)	3.6 (onshore project area)											
Site Features	Likely effect(s) of Norfolk Vanguard onshore project area											
	Direct effects within Ramsar site boundary			Direct effects on ex-situ habitats			Indirect effects within Ramsar site boundary			Indirect effects on ex-situ habitats		
	C	O	D	C	O	D	C	O	D	C	O	D
Bewick's Swan (*Cygnus columbianus bewickii)*	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Bittern (*Botaurus stellaris*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Hen Harrier (*Circus cyaneus*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Ruff (*Philomachus pugnax*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Whooper Swan (*Cygnus cygnus*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Gadwall (*Anas strepera*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Shoveler (*Anas clypeata*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Widgeon (*Anas penelope*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Pink-footed Goose (*Anser brachyrhynchus*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Wildfowl assemblage	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Tundra Swan (*Cygnus columbianus)*	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Eurasian wigeon (*Anas penelope*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Gadwall (*Anas strepera*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

Site	21											
Name of European Site:	Broadland SPA and Ramsar											
Distance to Norfolk Vanguard (km)	3.6 (onshore project area)											
Northern shoveler (*Anas clypeata*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Pink-footed goose (*Anser brachyrhynchus*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Greylag goose (*Anser anser*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

a) The Broadland SPA and Ramsar is located 3.6km from the onshore project area, and so the SPA is beyond the range of potential impact.

b) Surveys recorded waterbird counts that are considered to not be of a scale of national or greater importance, or to be a significant component of the Broadland SPA and Ramsar. Consequently, these ex-situ habitats are not considered to be important habitats for the qualifying features of the Broadland SPA and Ramsar.

Site	22											
Name of European Site:	Bruine Bank (Brown Ridge) pSPA											
Distance to Norfolk Vanguard (km)	ca.20km (a)											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding common guillemots *Uria aalge* and razorbills *Alca torda*		N (b)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (d)	N (d)	N (d)

(a) It should be noted that the distance from the Norfolk Vanguard site to the pSPA is uncertain as the boundaries of the pSPA are under consultation at present.

(b) The designated features of Bruine Bank pSPA are likely to be common guillemot and razorbill, species for which low flight height results in low risk of collision with offshore wind turbines. Furthermore, birds wintering on Bruine Bank are likely to remain at the pSPA because it is a high-quality feeding habitat (i.e. the reason why this concentration of birds is being proposed for SPA status), and so these birds are unlikely to be at risk of collision at the Norfolk Vanguard site.

(c) Bruine Bank is high quality feeding habitat for nonbreeding piscivorous seabirds from breeding areas further north, so the birds in that pSPA are unlikely to pass through the Norfolk Vanguard site on migration as it lies west rather than north of the pSPA. Therefore, displacement, disturbance and barrier effect at the Norfolk Vanguard site will not be likely to affect birds on Bruine Bank pSPA.

(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Bruine Bank pSPA.

Site	23											
Name of European Site:	Buchan Ness to Collieston Coast SPA											
Distance to Norfolk Vanguard (km)	556											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage, including as named features kittiwake, shag *Phalacrocorax aristotelis*, fulmar, guillemot, herring gull *Larus argentatus*		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Buchan Ness to Collieston Coast SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Buchan Ness to Collieston Coast SPA.

Site	24											
Name of European Site:	Calf of Eday SPA											
Distance to Norfolk Vanguard (km)	760											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features cormorant, fulmar *Fulmarus glacialis*, guillemot, kittiwake and great black-backed gull		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Calf of Eday SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Calf of Eday SPA.

Site	25														
Name of European Site:	Cap Sizun SAC														
Distance to Norfolk Vanguard (km)	711														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	26											
Name of European Site:	Caps Gris Nez SPA											
Distance to Norfolk Vanguard (km)	210											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage species: razorbill, kingfisher, pintail, white-fronted goose, greylag goose, short-eared owl, greater scaup, bittern, brent goose, sanderling, dunlin, purple sandpiper, Scopoli's shearwater, great skua, Kentish plover, little ringed plover, ringed plover, whiskered tern, black tern, white stork, marsh harrier, hen harrier, little egret, merlin, peregrine, puffin, fulmar, black-throated diver, great northern diver, red-throated diver, common crane, oystercatcher, black-winged stilt, storm petrel, red-backed shrike, Mediterranean gull, bar-tailed godwit, woodlark, velvet scoter, common scoter, smew, red-breasted merganser, black kite, red kite, gannet, curlew, whimbrel, osprey, honey buzzard, shag, cormorant, ruff, spoonbill, golden plover, grey		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

Site	**26**
Name of European Site:	**Caps Gris Nez SPA**
Distance to Norfolk Vanguard (km)	**210**
plover, Slavonian grebe, great crested grebe, red-necked grebe, black-necked grebe, Manx shearwater, avocet, kittiwake, eider, long-tailed skua, Arctic skua, pomarine skua, little tern, roseate tern, common tern, Arctic tern, Sandwich tern, wood sandpiper, guillemot, lapwing	
a) Many of the named species have not been recorded on the Norfolk Vanguard site and are not ones associated with offshore locations. With respect to seabird species named as nonbreeding features of the SPA, these consist of many of the seabird species which pass through the southern North Sea and English Channel on migration. As such the potential impacts on those species recorded at Norfolk Vanguard has been assessed in terms of the wider Biologically Defined Minimum Population Scales populations (see Furness 2015). The Applicant considers this to be the appropriate population scale for nonbreeding impacts on the species named at this SPA, since the majority of individuals will not be resident at the SPA but will instead pass through. Furthermore, given the relative size of the SPA population estimates for the migratory species compared with the total passage populations, the effects on the SPA populations due to Norfolk Vanguard would be negligible.b) The predicted effect attributable to the proposed Norfolk Vanguard project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Caps Griz Nez SPA.	

Site	**27**														
Name of European Site:	**Chausey SCI**														
Distance to Norfolk Vanguard (km)	**509**														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D

Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	**28**											
Name of European Site:	**Chesil Beach and The Fleet SPA & Ramsar**											
Distance to Norfolk Vanguard (km)	**420**											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding brent goose		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Chesil Beach & The Fleet SPA feature (brent goose) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Chesil Beach & The Fleet SPA and Ramsar.

Site	29											
Name of European Site:	Chichester and Langstone Harbours SPA & Ramsar											
Distance to Norfolk Vanguard (km)	313											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Migratory waterbird assemblage including as named features pintail *Anas acuta*, shoveler, teal, wigeon, turnstone *Arenaria interpres*, brent goose, sanderling *Calidris alba*, dunlin, ringed plover, bar-tailed godwit *Limosa lapponica*, red-breasted merganser *Mergus serrator*, curlew *Numenius arquata*, grey plover, shelduck *Tadorna tadorna*, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding little tern, common tern, Sandwich tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Chichester & Langstone Harbour SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Little tern, common tern and Sandwich tern have maximum foraging ranges from colonies of 11km, 30km and 54km respectively, so there is no connectivity between the SPA and Norfolk Vanguard site. Furthermore, these species tend to forage in coastal waters rather than offshore. Therefore, collision risk, displacement and barrier effects can be excluded.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Chichester & Langstone Harbour SPA and Ramsar.

30 Colne Estuary SPA and Ramsar 144	30 Colne Estuary SPA and Ramsar 144											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding brent goose		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (g)	N (g)	N (g)
Nonbreeding redshank		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (g)	N (g)	N (g)
Nonbreeding hen harrier		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (g)	N (g)	N (g)
Breeding pochard		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (g)	N (g)	N (g)
Breeding ringed plover		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (g)	N (g)	N (g)
Breeding little tern		N (f)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)

(a) Survey data show no evidence of Colne Estuary SPA feature (brent goose) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.
(b) Survey data show no evidence of Colne Estuary SPA feature (redshank) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.
(c) Survey data show no evidence of Colne Estuary SPA feature (hen harrier) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.
(d) Survey data show no evidence of Colne Estuary SPA feature (pochard) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.
(e) Survey data show no evidence of Colne Estuary SPA feature (ringed plover) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.
(f) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with the Norfolk Vanguard site. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.
(g) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Colne Estuary SPA and Ramsar.

Site	31											
Name of European Site:	Copinsay SPA											
Distance to Norfolk Vanguard (km)	725											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features fulmar, guillemot, kittiwake and great black-backed gull		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Copinsay SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Copinsay SPA.

Site	32											
Name of European Site:	Coquet Island SPA											
Distance to Norfolk Vanguard (km)	366											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding roseate tern *Sterna dougallii*, Arctic tern, common tern, Sandwich tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Coquet Island SPA is beyond maximum foraging range of designated seabird species (all less than 55km) so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Coquet Island SPA.

Site	33														
Name of European Site:	Cote De Granit Rose-Sept-Iles SAC														
Distance to Norfolk Vanguard (km)	583														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	34											
Name of European Site:	Cromarty Firth SPA & Ramsar											
Distance to Norfolk Vanguard (km)	664											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features curlew, dunlin, grey-lag goose *Anser anser*, pintail, red-breasted merganser, whooper swan, bar-tailed godwit, oystercatcher *Haematopus ostralegus*, wigeon, scaup *Aythya marila*, knot and redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (d)	N (d)	N (d)
Breeding common tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (d)	N (d)	N (d)
Breeding osprey *Pandion haliaetus*		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Cromarty Firth SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) SPA is beyond maximum foraging range of common tern (30km), and so has no breeding season connectivity. Numbers of SPA common tern migrating through the Norfolk Vanguard site are likely to be extremely small relative to BDMPS.

(c) Osprey has not been observed in the Norfolk Vanguard site, and it is improbable than any ospreys from the SPA migrate through the Norfolk Vanguard site.

(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Cromarty Firth SPA and Ramsar.

Site	35											
Name of European Site:	Crouch and Roach Estuaries SPA & Ramsar											
Distance to Norfolk Vanguard (km)	167											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding brent goose		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Nonbreeding hen harrier		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Crouch & Roach Estuary SPA feature (brent goose) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Survey data show no evidence of Crouch & Roach Estuary SPA feature (hen harrier) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Crouch & Roach Estuary SPA and Ramsar.

Site	36											
Name of European Site:	Deben Estuary SPA & Ramsar											
Distance to Norfolk Vanguard (km)	107											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding dark-bellied brent goose *Branta bernicla bernicla*		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Nonbreeding avocet		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Deben Estuary SPA features (brent goose) occurring in the Norfolk Vanguard site, and migrations of birds from the SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.
(b) Survey data show no evidence of avocets occurring within the Norfolk Vanguard site, and numbers migrating through the site are likely to be negligible.
(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Deben Estuary SPA and Ramsar.

Site	37											
Name of European Site:	Dengie SPA & Ramsar											
Distance to Norfolk Vanguard (km)	155											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding brent goose		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Nonbreeding knot		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Nonbreeding grey plover		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Nonbreeding hen harrier		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Dengie SPA features (brent goose, knot, grey plover, hen harrier) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Dengie SPA and Ramsar.

Site	38														
Name of European Site:	Doggerbank SCI														
Distance to Norfolk Vanguard (km)	281														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	39														
Name of European Site:	Doggersbank SCI														
Distance to Norfolk Vanguard (km)	149														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	40											
Name of European Site:	Dornoch Firth and Loch Fleet SPA & Ramsar											
Distance to Norfolk Vanguard (km)	669											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features curlew, dunlin, greylag goose, wigeon, bar-tailed godwit, teal, oystercatcher		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding osprey		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Dornoch Firth & Loch Fleet SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Osprey has not been observed in the Norfolk Vanguard site, and it is improbable than any ospreys from the SPA migrate through the Norfolk Vanguard site.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Dornoch Firth & Loch Fleet SPA & Ramsar.

Site	41														
Name of European Site:	Dünenlandschaft Süd-Sylt SAC														
Distance to Norfolk Vanguard (km)	399														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	42
Name of European Site:	Dunes De La Plaine Maritime Flamande SAC
Distance to Norfolk Vanguard (km)	185

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard															
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination			
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	

Benthic Habitats

Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Mudflats and sandflats not covered by seawater at low tide	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)

a) The distance between the potential impact range of Norfolk Vanguard and the site is beyond that of potential for direct or indirect effects.
b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	43											
Name of European Site:	East Caithness Cliffs SPA											
Distance to Norfolk Vanguard (km)	685											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features cormorant, guillemot, herring gull, puffin *Fratercula arctica*, razorbill, shag, fulmar and great black-backed gull		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding peregrine *Falco peregrinus*		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) East Caithness Cliffs SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are small relative to BDMPS.
(b) Peregrines breeding in the UK normally remain close to their breeding areas throughout the year, and are therefore very unlikely to migrate offshore.
(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at East Caithness Cliffs SPA.

Site	44
Name of European Site:	Essex Estuaries SAC
Distance to Norfolk Vanguard (km)	114

Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Estuaries	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Mudflats and sandflats not covered by seawater at low tide	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	45														
Name of European Site:	Estuaire De La Canche, Dunes Picardes Plaquees Sur L'ancienne Falaise, Foret D'hardelot Et Falaise D'equihen SAC														
Distance to Norfolk Vanguard (km)	241														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	46														
Name of European Site:	Estuaire de la Seine SCI														
Distance to Norfolk Vanguard (km)	394														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	**47**
Name of European Site:	**Estuaires et littoral picards (baies de Somme et d'Authie) SAC**
Distance to Norfolk Vanguard (km)	**275**

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Harbour seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

Fish

Site Features	Likely effect(s) of Norfolk Vanguard																				
	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
River lamprey	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	48											
Name of European Site:	Exe Estuary SPA & Ramsar											
Distance to Norfolk Vanguard (km)	470											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Migratory waterbird assemblage including as named features brent goose, dunlin, oystercatcher, black-tailed godwit, grey plover, Slavonian grebe *Podiceps auritus*, avocet		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Exe Estuary SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Exe Estuary SPA & Ramsar.

Site	49											
Name of European Site:	Fair Isle SPA											
Distance to Norfolk Vanguard (km)	762											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features Arctic skua *Stercorarius parasiticus*, fulmar, gannet, great skua *Stercorarius skua*, puffin, razorbill, Arctic tern, guillemot, kittiwake, shag		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Fair Isle wren		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Fair Isle SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.
(b) Fair Isle wren is a resident Shetland subspecies that is thought never to leave the island.
(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Fair Isle SPA.

Site	50											
Name of European Site:	Falaise du Bessin Occidental SPA											
Distance to Norfolk Vanguard (km)	445											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding kittiwake, herring gull, lesser black-backed gull, fulmar		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (g)	N (g)	N (g)
Nonbreeding red-throated diver		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (g)	N (g)	N (g)
Nonbreeding cormorant, shag, red-breasted merganser		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (g)	N (g)	N (g)
Nonbreeding guillemot, razorbill		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (g)	N (g)	N (g)
Nonbreeding peregrine, short-eared owl *Asio flammeus*		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (g)	N (g)	N (g)
Breeding Dartford warbler *Sylvia undata*		N (f)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)

(a) Falaise du Bessin Occidental SPA is far beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be extremely small relative to BDMPS, as these species are likely to migrate into the Atlantic rather than northwards into the North Sea in autumn, and are unlikely to pass through the North Sea in spring.

(b) Nonbreeding red-throated divers at this SPA are likely to include birds from Scandinavia and the UK, especially juveniles which winter further south than adults. Their migrations between breeding grounds and the SPA probably take most individuals along the continental coast of Europe rather than across the North Sea. Small numbers may cross the North Sea towards the UK or Icelandic breeding grounds. However, red-throated divers tend to fly low over the sea so will be at very low risk of collision. Red-throated divers strongly avoid disturbance and offshore wind farms and so may have to fly further by flying around the Norfolk Vanguard site rather than through the wind farm. However, in the context of a migration of over 1000km, the extra distance flown to pass an offshore wind farm represents a negligible increase in energy expenditure for the very few individuals that might be affected.

(c) Cormorants, shags and red-breasted mergansers do not normally occur at the Norfolk Vanguard site based on bird survey data. Furthermore, these species tend to fly low over the sea and so would be at negligible risk of collision, and do not show displacement or barrier effects. Indeed, cormorants seem to benefit from offshore wind farm structures permitting them to extend foraging range offshore, and the same may be true for shag and red-breasted merganser which may also benefit from foraging opportunities around turbine bases.

Site	50											
Name of European Site:	Falaise du Bessin Occidental SPA											
Distance to Norfolk Vanguard (km)	445											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D

(d) Nonbreeding guillemots and razorbills fly low over the sea and so are at very low risk of collision. However, they are partially displaced from offshore wind farms and may fly around rather than through offshore wind farms. A very small proportion of the guillemots and razorbills from this SPA might migrate through the Norfolk Vanguard site towards breeding areas further north, but the area of foraging habitat lost to these birds if they avoid the Norfolk Vanguard site would be negligible in relation to the wider area of the North Sea and Channel over which they forage, and the increase in migration distance to fly around rather than through the wind farm would be negligible in relation to a migration distance of hundreds of kilometres.

(e) Peregrines in western Europe do not normally migrate, so would be extremely unlikely to move between this SPA and the Norfolk Vanguard site. Short-eared owls are more migratory, and sometimes cross the North Sea, but since this SPA is 445km from the Norfolk Vanguard site, the chances of a short-eared owl from the SPA passing through the Norfolk Vanguard site are extremely small.

(f) Dartford warbler is a resident species that is unlikely to move from this SPA.

(g) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Falaise du Bessin Occidental SPA.

Site	51																	
Name of European Site:	Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant SAC																	
Distance to Norfolk Vanguard (km)	217																	
Marine Mammals																		
Site Features	Likely effect(s) of Norfolk Vanguard																	
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination					
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D			
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)			
Harbour (common) seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)			
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)			
Benthic Habitats																		
Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Mudflats and sandflats not covered by seawater at low tide	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Reefs	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)

Site	**51**
Name of European Site:	**Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant SAC**
Distance to Norfolk Vanguard (km)	**217**

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	**52**
Name of European Site:	**Falaises et Pelouses du Cap Blanc Nez, du Mont d'Hubert, des Noires Mottes, du Fond de la Forge et du Mont de couple SAC**
Distance to Norfolk Vanguard (km)	**212**

Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Mudflats and sandflats not covered by seawater at low tide	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Reefs	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	53														
Name of European Site:	Faray and Holm of Faray SAC														
Distance to Norfolk Vanguard (km)	762														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	54											
Name of European Site:	Farne Islands SPA											
Distance to Norfolk Vanguard (km)	393											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding Arctic tern, common tern, Sandwich tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
(a) Farne Islands SPA is beyond maximum foraging range of these designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS. (b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Farne Islands SPA.												

Site	55											
Name of European Site:	Fetlar SPA											
Distance to Norfolk Vanguard (km)	859											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features Arctic skua, fulmar, great skua, Arctic tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding dunlin, whimbrel *Numenius phaeopus*, red-necked phalarope *Phalaropus lobatus*		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Fetlar SPA is beyond the maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are small relative to BDMPS.

(b) Dunlin, whimbrel and red-necked phalarope have not been observed migrating through the Norfolk Vanguard site. Red-necked phalaropes from Fetlar SPA have been tracked by geolocator and migrate from Shetland to the Pacific Ocean via Iceland, Greenland and Canada, and so would not pass near to Norfolk Vanguard. Dunlin and whimbrel from Fetlar SPA migrate south, but are unlikely to pass through the Norfolk Vanguard site.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Fetlar SPA.

Site	56											
Name of European Site:	Firth of Forth SPA & Ramsar											
Distance to Norfolk Vanguard (km)	463											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features curlew, dunlin, goldeneye, great crested grebe, knot, lapwing, mallard *Anas platyrhynchos,* pink-footed goose *Anser brachyrhynchus*, red-breasted merganser, ringed plover, Sandwich tern, Slavonian grebe, turnstone, wigeon, common scoter *Melanitta nigra*, golden plover, long-tailed duck *Clangula hyemalis*, redshank, shelduck, bar-tailed godwit, cormorant, eider *Somateria mollissima*, grey plover, oystercatcher, red-throated diver, scaup, velvet scoter *Melanitta fusca*		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration. Therefore, proportions of these populations migrating through the Norfolk Vanguard site are likely to be extremely small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Firth of Forth SPA & Ramsar.

Site	57											
Name of European Site:	Firth of Tay & Eden Estuary SPA & Ramsar											
Distance to Norfolk Vanguard (km)	503											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features common scoter, cormorant, eider, goosander *Mergus merganser*, grey plover, long-tailed duck, red-breasted merganser, sanderling, velvet scoter, dunlin, greylag goose, redshank, oystercatcher, bar-tailed godwit, goldeneye, Icelandic black-tailed godwit *Limosa limosa islandica*, pink-footed goose		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (d)	N (d)	N (d)
Breeding marsh harrier		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)
Breeding little tern		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Firth of Tay & Eden Estuary SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Marsh harrier is a migrant species. Satellite tracking suggests that marsh harriers from Scotland migrate overland to the south coast of England and over the Channel to France, rather than across the North Sea, and so are unlikely to pass through the Norfolk Vanguard site.

(c) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with the Norfolk Vanguard site. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Firth of Tay & Eden Estuary SPA & Ramsar.

Site	58											
Name of European Site:	Flamborough and Filey Coast pSPA											
Distance to Norfolk Vanguard (km)	205											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding kittiwake		**Y (a)**		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (c)	**Y (a)**	N (c)
Breeding gannet		**Y (a)**		N (g)	**Y (d)**	N (g)	N (e)	N (e)	N (e)	N (c)	**Y (a)**	N (c)
Breeding common guillemot		N (f)		N (g)	**Y (h)**	N (g)	N (g)	N (i)	N (g)	N (c)	**Y (h)**	N (c)
Breeding razorbill		N (f)		N (g)	**Y (h)**	N (g)	N (g)	N (i)	N (g)	N (c)	**Y (h)**	N (c)
Breeding puffin		N (f)		N (g)	**Y (h)**	N (g)	N (g)	N (i)	N (g)	N (c)	**Y (h)**	N (c)

(a) Band model estimates of collision mortality indicate that LSE cannot be ruled out at the Screening stage.
(b) Kittiwakes are not considered to be at risk of disturbance and displacement or barrier effects at offshore wind farms therefore LSE can be ruled out.
(c) The predicted effect attributable to the proposed Norfolk Vanguard project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Flamborough and Filey Coast SPA.
(d) Flamborough and Filey Coast SPA is 205km from Norfolk Vanguard. Thaxter et al. (2012) report a mean foraging range of breeding gannets as 92.5km, and a maximum recorded distance of 590km. Norfolk Vanguard is therefore considerably beyond the mean foraging range of breeding gannets, but within their maximum range. Breeding gannets from Flamborough & Filey Coast SPA may therefore be affected by displacement. Searle et al. (2014) found that even for offshore wind farms considerably closer to a gannet breeding colony than under consideration here, impacts of displacement were negligible for this species because of its very long foraging range and large area used for foraging. Similarly, impacts of displacement during migration are considered likely to be negligible. Nonetheless, Natural England consider that an LSE cannot be ruled out at the Screening stage.
(e) Gannets are not considered at risk of barrier effects due to their wide ranging habits (see d), and migrating gannets cover very large distances, extending from the North Sea to West Africa, so that slight local effects would be negligible in the context of their large migrations and area use, therefore LSE can be ruled out.
(f) Common guillemots, razorbills and puffins tend to fly low over the sea so have a very low risk of collision mortality, therefore LSE can be ruled out.
(g) Construction and decommissioning impacts are temporary and localised therefore LSE can be ruled out.
(h) Flamborough and Filey Coast SPA is 205km from Norfolk Vanguard. Thaxter et al. (2012) report a mean foraging range of breeding common guillemots as 37.8km, and a maximum recorded distance of 135km. Thaxter et al. (2012) report a mean foraging range of breeding razorbills as 23.7km, and a maximum recorded distance of 95km. Thaxter et al. (2012) report a mean foraging range of breeding puffin as 4km, and a maximum recorded distance of 200km. Norfolk Vanguard is therefore considerably beyond the normal foraging range of these species from Flamborough and Filey Coast SPA. It is therefore unlikely that any breeding adults from Flamborough and Filey Coast SPA will be present at Norfolk Vanguard during the breeding season. During the nonbreeding season, birds from Flamborough

Site	58
Name of European Site:	Flamborough and Filey Coast pSPA
Distance to Norfolk Vanguard (km)	205

and Filey Coast SPA are likely to be mixed with the large BDMPS populations of these species so that apportioning of the impact of the low level of displacement mortality generates a negligible impact to Flamborough and Filey Coast SPA. Nonetheless, Natural England consider that an LSE cannot be ruled out at the Screening stage.

(i) Since Norfolk Vanguard is beyond the normal foraging range of breeding common guillemots, razorbills and puffins from Flamborough and Filey Coast SPA, there will be no breeding season barrier impact for those populations. During the nonbreeding period birds from Flamborough and Filey Coast SPA are likely to be mixed with the large BDMPS populations of these species so that apportioning of the impact of the low level of displacement to this very large BDMPS population apportions a negligible impact to Flamborough and Filey Coast SPA.

Site	59
Name of European Site:	Flamborough Head SAC
Distance to Norfolk Vanguard (km)	199

Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Submerged or partially submerged sea caves	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	60											
Name of European Site:	Forth Islands SPA											
Distance to Norfolk Vanguard (km)	471											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features gannet, kittiwake, lesser black-backed gull, roseate tern, Sandwich tern, guillemot, razorbill, fulmar, common tern, Arctic tern, cormorant, herring gull, puffin, shag		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Forth Islands SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Forth Islands SPA.

Site	61											
Name of European Site:	Foula SPA											
Distance to Norfolk Vanguard (km)	833											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features Arctic tern, fulmar, guillemot, razorbill, red-throated diver, Arctic skua, kittiwake, shag, Leach's storm-petrel *Oceanodroma leucorhoa*, great skua, puffin		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Foula SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Foula SPA.

Site	62											
Name of European Site:	Foulness SPA and Ramsar											
Distance to Norfolk Vanguard (km)	158											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features brent goose, knot, oystercatcher, bar-tailed godwit, grey plover, avocet, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (e)	N (e)	N (e)
Nonbreeding hen harrier		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (e)	N (e)	N (e)
Breeding ringed plover, avocet		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)
Breeding little tern, common tern, Sandwich tern		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)

(a) Survey data show little or no evidence of Foulness SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration.

(b) Survey data show no evidence of hen harrier occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration, as the species is likely to migrate overland rather than over sea where the option is available.

(c) Ringed plover and avocet have not been observed during bird site-specific surveys. It is highly unlikely that these birds would migrate through the Norfolk Vanguard site as their migration is likely to take a coastal route and cross sea at narrow points such as The English Channel. If they did migrate through the Norfolk Vanguard site their flight height is likely not to be at collision risk height.

(d) Little tern, common tern and Sandwich tern have maximum foraging ranges from colonies of 11km, 30km and 54km respectively, so there is no connectivity between the SPA and Norfolk Vanguard site. Furthermore, these species tend to forage in coastal waters rather than offshore. Therefore, collision risk, displacement and barrier effects can be excluded.

(e) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Foulness SPA and Ramsar.

Site	63											
Name of European Site:	Fowlsheugh SPA											
Distance to Norfolk Vanguard (km)	525											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features fulmar, guillemot, kittiwake, razorbill, herring gull		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Fowlsheugh SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Fowlsheugh SPA.

Site	64											
Name of European Site:	Frisian Front pSPA											
Distance to Norfolk Vanguard (km)	ca. 100km*											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding common guillemot, great skua, great black-backed gull, lesser black-backed gull		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

*Distance from the Norfolk Vanguard site is uncertain as the boundaries of the pSPA are under consultation at present.

(a) Migrations of birds from this pSPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration relative to the size of BDMPS regional populations.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Frisian Front pSPA.

Site	65											
Name of European Site:	Gibraltar Point SPA and Ramsar											
Distance to Norfolk Vanguard (km)	133											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding sanderling, bar-tailed godwit, grey plover		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding little tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show no evidence of Gibraltar Point SPA features (sanderling, bar-tailed godwit, grey plover) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration.

(b) Breeding little tern has a maximum foraging range of 11km (Thaxter et al. 2012) from colonies, so would have no connectivity with the Norfolk Vanguard site. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Gibraltar Point SPA and Ramsar.

Site	66											
Name of European Site:	Great Yarmouth and North Denes SPA											
Distance to Norfolk Vanguard (km)	49											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding little tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Great Yarmouth & North Denes SPA is beyond the maximum foraging range of little tern (11km) and foraging tends to be coastal so has no breeding season connectivity. Proportions of this population migrating through the Norfolk Vanguard site are likely to be small as the species is thought to remain close to shore during much of its migration through UK waters.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Great Yarmouth & North Denes SPA.

Site	67											
Name of European Site:	Greater Wash SPA											
Distance to Norfolk Vanguard (km)	ca. 36km*											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabirds (little tern, common tern, Sandwich tern)		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)
Nonbreeding red-throated diver		N (b)		**Y (c)**	**Y (i)**	N (d)	N (b)	N (b)	N (b)	**Y (c)**	**Y (i)**	N (h)
Nonbreeding little gull		**Y (e)**		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (h)	**Y (e)**	N (h)
Nonbreeding common scoter		N (g)		N (g)	N (g)	N (g)	N (g)	N (g)	N (g)	N (h)	N (h)	N (h)

*Note that this distance refers to the Norfolk Vanguard site. The export cable will pass through the SPA.

(a) Little tern, common tern and Sandwich tern have maximum foraging ranges from colonies of 11km, 30km and 54km respectively, which suggests potential connectivity between the SPA and the Norfolk Vanguard site. However, the tern colonies are at locations along the Norfolk coast which are beyond these foraging distances from the Norfolk Vanguard site. Therefore, connectivity between the SPA and Norfolk Vanguard site is ruled out on the basis of distance. Furthermore, these species tend to forage in coastal waters rather than offshore. Hence, collision risk, displacement and barrier effects can be excluded.

(b) Red-throated divers fly close to the sea surface and are therefore at extremely low risk of collisions or barrier effects.

(c) LSE cannot be ruled out at screening for impacts of Displacement/Disturbance to nonbreeding red-throated divers as a result of construction work (specifically for export cable laying operations through part of the Greater Wash SPA).

(d) Displacement/Disturbance of red-throated diver during operation and decommissioning is considered negligible as the increase in vessel traffic within the SPA due to Norfolk Vanguard will be negligible compared to the current baseline.

(e) There is potential for little gull connectivity between the SPA and the Norfolk Vanguard site, therefore LSE cannot be ruled out at screening for collision risk impacts to nonbreeding little gull.

(f) Displacement of little gulls by offshore wind farms appears to be negligible**, indicating no LSE for this SPA feature as a consequence of displacement or barrier effects.

(g) Surveys found no common scoters in the Norfolk Vanguard site since this species favours waters <20m in depth. Common scoter was also only present at very low densities along the export cable route, therefore no LSE for this SPA feature is predicted.

(h) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Greater Wash pSPA.

(i) Following advice from Natural England it is considered that Operations and Maintenance vessels may disturb red-throated divers whilst transiting through the SPA therefore an LSE cannot be screened out.

** Dierschke, V., Furness, R.W. and Garthe, S. 2016. Seabirds and offshore wind farms in European waters: Avoidance and attraction. Biological Conservation 202, 59-68.

Site	**68**														
Name of European Site:	**Gule Rev SCI**														
Distance to Norfolk Vanguard (km)	**571**														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	69																	
Name of European Site:	Haisborough, Hammond and Winterton SAC																	
Distance to Norfolk Vanguard (km)	0																	
Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss/Introduction of new sediment			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**		**Y (a)**	**Y (a)**		**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**
Reefs	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**		**Y (a)**	**Y (a)**		**Y (a)**	**Y (a)**	**Y (a)**	**Y (a)**

(a) Site overlaps with the Norfolk Vanguard offshore cable corridor and therefore LSE cannot be ruled out at the screening stage.

Site	70														
Name of European Site:	Hamburgisches Wattenmeer SCI														
Distance to Norfolk Vanguard (km)	361														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	71											
Name of European Site:	Hamford Water SPA and Ramsar											
Distance to Norfolk Vanguard (km)	127											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features teal, brent goose, ringed plover, black-tailed godwit, grey plover, avocet, shelduck, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding little tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Hamford Water SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration.

(b) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with the Norfolk Vanguard site. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Hamford Water SPA and Ramsar.

Site	72														
Name of European Site:	Helgoland mit Helgolander Felssockel SAC														
Distance to Norfolk Vanguard (km)	343														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	73											
Name of European Site:	Hermaness, Saxa Vord and Valla Field SPA											
Distance to Norfolk Vanguard (km)	881											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features gannet, guillemot, red-throated diver, puffin, fulmar, kittiwake, great skua, shag		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Hermaness, Saxa Vord & Valla Field SPA is beyond the maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Hermaness, Saxa Vord & Valla Field SPA.

Site	74											
Name of European Site:	Hornsea Mere SPA											
Distance to Norfolk Vanguard (km)	197											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding gadwall, mute swan		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Survey data show no evidence of Hornsea Mere SPA features (gadwall, mute swan) occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Hornsea Mere SPA.

Site	75											
Name of European Site:	Hoy SPA											
Distance to Norfolk Vanguard (km)	733											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features Arctic skua, great black-backed gull, guillemot, kittiwake, red-throated diver, fulmar, puffin, great skua		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding peregrine		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Hoy SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are small relative to BDMPS.
(b) Peregrines breeding in the UK normally remain close to their breeding areas throughout the year, and are very unlikely to migrate offshore in the UK.
(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Hoy SPA.

Site	76
Name of European Site:	Humber Estuary SAC
Distance to Norfolk Vanguard (km)	149

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions and disturbance at seal haul outs			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N (a)	N (a)	N (a)	**Y(b)**	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

Fish

Site Features	Likely effect(s) of Norfolk Vanguard																				
	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sea Lamprey	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)
River lamprey	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)

Site	**76**
Name of European Site:	**Humber Estuary SAC**
Distance to Norfolk Vanguard (km)	**149**

Benthic habitats

Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Estuaries	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)
Mudflats and sandflats not covered by seawater at low tide	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)
Sandbanks which are slightly covered by sea water all the time	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)
Coastal lagoons	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

b) Potential for vessel interactions and disturbance at seal haul-out sites if a port to the north of the offshore project area is selected and therefore LSE cannot be ruled out at the screening stage.

c) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	77											
Name of European Site:	Humber Estuary SPA and Ramsar											
Distance to Norfolk Vanguard (km)	149											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features teal, wigeon, mallard, turnstone, pochard, scaup, bittern, brent goose, goldeneye, sanderling, dunlin, knot, ringed plover, oystercatcher, bar-tailed godwit, black-tailed godwit, curlew, golden plover, grey plover, avocet, shelduck, redshank, lapwing, whimbrel, ruff, greenshank *Tringa nebularia*		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (g)	N (g)	N (g)
Nonbreeding hen harrier		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (g)	N (g)	N (g)
Breeding bittern		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (g)	N (g)	N (g)
Breeding marsh harrier		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)
Breeding avocet		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (g)	N (g)	N (g)
Breeding little tern		N (f)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)

(a) Survey data show little or no evidence of Humber Estuary SPA features occurring in the Norfolk Vanguard sites, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration.

(b) Survey data show no evidence of Humber Estuary SPA feature hen harrier occurring in the Norfolk Vanguard sites, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration as UK birds are likely to migrate overland rather than over the sea where possible.

(c) Bittern has not been observed during bird surveys at Norfolk Vanguard, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration.

(d) Marsh harrier is a migrant species. Satellite tracking suggests that marsh harriers migrate overland to the south coast of England and over the Channel to

Site	**77**
Name of European Site:	**Humber Estuary SPA and Ramsar**
Distance to Norfolk Vanguard (km)	**149**

France, rather than across the North Sea.

(e) Avocet has not been observed during bird site specific surveys. It is highly unlikely that these birds would migrate through the Norfolk Vanguard site as their migration is likely to take a coastal route and cross sea at narrow points such as The English Channel. If they did migrate through the Norfolk Vanguard site their flight height is likely not to be at collision risk height.

(f) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with Norfolk Vanguard. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

(g) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Humber Estuary SPA and Ramsar.

Site	**78**
Name of European Site:	**Hund und Paapsand SCI**
Distance to Norfolk Vanguard (km)	**261**

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	79											
Name of European Site:	Imperial Dock Lock, Leith SPA											
Distance to Norfolk Vanguard (km)	491											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding common tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Imperial Dock Lock SPA is beyond the maximum foraging range of common tern (30km) so has no breeding season connectivity. The proportion of the population migrating through the Norfolk Vanguard site is likely to be extremely small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Imperial Dock Lock SPA.

Site	80																	
Name of European Site:	Inner Dowsing, Race Bank and North Ridge SCI																	
Distance to Norfolk Vanguard (km)	44																	
Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Reefs	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	81											
Name of European Site:	Inner Moray Firth SPA & Ramsar											
Distance to Norfolk Vanguard (km)	652											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features bar-tailed godwit, curlew, goldeneye, greylag goose, redshank, wigeon, goosander, teal, red-breasted merganser, cormorant, oystercatcher, scaup		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (d)	N (d)	N (d)
Breeding osprey		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)
Breeding common tern		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (d)	N (d)	N (d)

(a) Survey data show little or no evidence of Inner Moray Firth SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA and Ramsar are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Osprey has not been observed in the Norfolk Vanguard site, and it is extremely unlikely that any ospreys from the Inner Moray Firth SPA migrate through the Norfolk Vanguard site.

(c) Inner Moray Firth SPA is far beyond maximum foraging range of common tern so has no breeding season connectivity. The proportion of the population migrating through the Norfolk Vanguard site is likely to be extremely small relative to BDMPS.

(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Inner Moray Firth SPA & Ramsar.

Site Name of European Site: Distance to Norfolk Vanguard (km)	82 Isle of May SAC 478														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	83														
Name of European Site:	Klaverbank SCI														
Distance to Norfolk Vanguard (km)	93														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	84														
Name of European Site:	Knudegrund SAC														
Distance to Norfolk Vanguard (km)	675														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	85														
Name of European Site:	Kosterfjorden-Väderöfjorden SAC														
Distance to Norfolk Vanguard (km)	800														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	86														
Name of European Site:	Küsten- und Dünenlandschaften Amrums SAC														
Distance to Norfolk Vanguard (km)	395														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	87											
Name of European Site:	Lindisfarne SPA and Ramsar											
Distance to Norfolk Vanguard (km)	398											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features wigeon, greylag goose, brent goose, sanderling, dunlin, ringed plover, goldeneye, whooper swan, black-tailed godwit, common scoter, red-breasted merganser, golden plover, grey plover, eider, shelduck, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding little tern, roseate tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Lindisfarne SPA features occurring in the Norfolk Vanguard OWF sites, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with Norfolk Vanguard. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site. Breeding roseate tern has a maximum foraging range of 30km from colonies, so would have no connectivity with Norfolk Vanguard. Migrating roseate terns are unlikely to pass through the Norfolk Vanguard site as their migration tends to be coastal.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Lindisfarne SPA and Ramsar.

Site	88														
Name of European Site:	Littoral Cauchois SAC														
Distance to Norfolk Vanguard (km)	314														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	89											
Name of European Site:	Littoral Seino-Marin SPA											
Distance to Norfolk Vanguard (km)	315											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabirds including fulmar, shag, gannet, herring gull, great black-backed gull, kittiwake		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (f)	N (f)	N (f)
Nonbreeding winter and passage seabird assemblage including as named features red-throated diver, black-throated diver, great crested grebe, fulmar, gannet, cormorant, shag, pomarine skua *Stercorarius pomarinus*, great skua, Mediterranean gull *Larus melanocephalus*, little gull, lesser black-backed gull, herring gull, great black-backed gull, kittiwake, Sandwich tern, common tern, guillemot, razorbill		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (f)	N (f)	N (f)
Nonbreeding little egret, spoonbill *Platalea leucorodia*, honey buzzard *Pernis apivorus*, hen harrier, merlin *Falco columbarius*, peregrine, avocet		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)
Breeding peregrine		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)
Nonbreeding woodlark *Lullula arborea*		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)

(a) The Norfolk Vanguard site is within the theoretical maximum foraging range of breeding gannets from the Littoral Seino-Marin SPA, but tracking data show that breeding gannets from the SPA do not reach the Norfolk Vanguard site. The SPA is far beyond maximum foraging range of other designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be

Site	89
Name of European Site:	Littoral Seino-Marin SPA
Distance to Norfolk Vanguard (km)	315

extremely small relative to BDMPS.

(b) Proportions of these populations migrating through the Norfolk Vanguard site are likely to be extremely small relative to BDMPS, not only because the SPA is 315km from the Norfolk Vanguard site, but also because birds on the continental side of the Channel and North Sea are likely to tend to migrate up the continental coast rather than crossing the North Sea to the UK.

(c) None of these species has been recorded during bird surveys at the Norfolk Vanguard site. It is unlikely that birds from the SPA will migrate through the Norfolk Vanguard site, as these species are generally scarce migrants in the UK, and their migrations tend to be coastal rather than over open sea.

(d) Breeding peregrines in western Europe tend to remain close to their breeding site throughout the year so it is extremely unlikely that any from the SPA would reach Norfolk Vanguard site.

(e) Woodlark is a very scarce migrant to the UK, so it is very unlikely that individuals from the SPA would reach the Norfolk Vanguard site.

(f) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Littoral Seino-Marin SPA.

Site	90											
Name of European Site:	Loch of Strathbeg SPA & Ramsar											
Distance to Norfolk Vanguard (km)	581											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features greylag goose, pink-footed goose, teal, Svalbard barnacle goose *Branta leucopsis*, whooper swan		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding Sandwich tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Loch of Strathbeg SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Loch of Strathbeg SPA is far beyond maximum foraging range of Sandwich tern (54km, Thaxter et al. 2012) so has no breeding season connectivity. Proportion of the population migrating through the Norfolk Vanguard site is likely to be extremely small relative to BDMPS.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Loch of Strathbeg SPA & Ramsar.

Site	91														
Name of European Site:	Lønstrup Rødgrund SAC														
Distance to Norfolk Vanguard (km)	648														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site Name of European Site:	92 Margate and Long Sands SCI																	
Distance to Norfolk Vanguard (km)	99																	
Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.																		

Site	93											
Name of European Site:	Marwick Head SPA											
Distance to Norfolk Vanguard (km)	767											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features guillemot and kittiwake		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Marwick Head SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Marwick Head SPA.

Site	94											
Name of European Site:	Medway Estuary & Marshes SPA and Ramsar											
Distance to Norfolk Vanguard (km)	190											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features pintail, shoveler, teal, wigeon, turnstone, brent goose, dunlin, knot, ringed plover Bewick's swan, oystercatcher, black-tailed godwit, curlew, grey plover, great crested grebe, avocet, shelduck, greenshank, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (d)	N (d)	N (d)
Breeding avocet		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)
Breeding little tern, common tern		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Medway Estuary & Marshes SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Avocet has not been observed during bird site-specific surveys. It is highly unlikely that these birds would migrate through the Norfolk Vanguard site as their migration is likely to take a coastal route and cross sea at narrow points such as The English Channel. If they did migrate through the Norfolk Vanguard site their flight height is likely not to be at collision risk height.

(c) Breeding little tern has a maximum foraging range of 11km from colonies (Thaxter et al. 2012), so would have no connectivity with Norfolk Vanguard. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site. Breeding common tern has a maximum foraging range of 30km from colonies (Thaxter et al. 2012), so would have no connectivity with Norfolk Vanguard. Migrating common terns are unlikely to pass through the Norfolk Vanguard site as their migration tends to be coastal where that is an option.

(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Medway Estuary & Marshes SPA and Ramsar.

Site	95											
Name of European Site:	Minsmere - Walberswick SPA and Ramsar											
Distance to Norfolk Vanguard (km)	75											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering shoveler, gadwall, white-fronted goose		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (g)	N (g)	N (g)
Nonbreeding hen harrier		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (g)	N (g)	N (g)
Breeding shoveler, teal, gadwall, bittern, avocet		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (g)	N (g)	N (g)
Breeding nightjar *Caprimulgus europaeus*		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (g)	N (g)	N (g)
Breeding marsh harrier		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (e)
Breeding little tern		N (f)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (f)

(a) Survey data show no evidence of Minsmere-Walberswick SPA features shoveler, gadwall or white-fronted goose occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Survey data show no evidence of hen harrier occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site as UK birds are likely to migrate overland rather than over the sea where possible.

(c) Survey data show no evidence of Minsmere-Walberswick SPA features shoveler, teal, gadwall, bittern or avocet occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(d) Survey data show no evidence of nightjar occurring in the Norfolk Vanguard OWF sites, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site as UK birds are likely to migrate overland rather than over the sea where possible and make short sea crossings from southern England to France.

(e) Marsh harrier is a migrant species. Satellite tracking suggests that marsh harriers migrate overland to the south coast of England and over the Channel to France, rather than across the North Sea.

(f) Breeding little tern has a maximum foraging range of 11km from colonies (Thaxter et al. 2012), so would have no connectivity with Norfolk Vanguard. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

(g) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for

Site	**95**
Name of European Site:	**Minsmere - Walberswick SPA and Ramsar**
Distance to Norfolk Vanguard (km)	**75**

these features at Minsmere-Walberswick SPA and Ramsar.

Site	**96**
Name of European Site:	**Montrose Basin SPA & Ramsar**
Distance to Norfolk Vanguard (km)	**520**

Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features dunlin, eider, knot, shelduck, wigeon, pink-footed goose, greylag goose, redshank, oystercatcher		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Montrose Basin SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Montrose Basin SPA and Ramsar.

Site	97											
Name of European Site:	Moray and Nairn Coast SPA & Ramsar											
Distance to Norfolk Vanguard (km)	624											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features common scoter, long-tailed duck, oystercatcher, bar-tailed godwit, wigeon, pink-footed goose, red-breasted merganser, redshank, velvet scoter, greylag goose, dunlin		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding osprey		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Moray & Nairn Coast SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.
(b) Osprey has not been observed in the Norfolk Vanguard site, and it is improbable that any ospreys from the SPA migrate through the Norfolk Vanguard site.
(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Moray & Nairn Coast SPA and Ramsar.

Site	98											
Name of European Site:	Mousa SPA											
Distance to Norfolk Vanguard (km)	807											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding Arctic tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding European storm-petrel *Hydrobates pelagicus*		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Mousa SPA is beyond maximum foraging range of Arctic tern (30km, Thaxter et al. 2012) so has no breeding season connectivity. The proportion of the population migrating through the Norfolk Vanguard site is likely to be extremely small relative to BDMPS.

(b) European storm-petrels were not observed in the Norfolk Vanguard site, and are rarely seen anywhere in the southern North Sea, so evidence suggests that this species migrates from its breeding site on Mousa into the North Atlantic and not normally through the North Sea.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Mousa SPA.

Site Name of European Site: Distance to Norfolk Vanguard (km)	99 Muhlenberger Loch/Nesssand SCI 448														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site Name of European Site: Distance to Norfolk Vanguard (km)	100 Nationalpark Niedersächsisched Wattenmeer SAC 246														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	**101**
Name of European Site:	**Noordzeekustzone SAC**
Distance to Norfolk Vanguard (km)	**98**

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions and disturbance at seal haul outs			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Grey seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Harbour seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

Fish

Site Features	Likely effect(s) of Norfolk Vanguard																				
	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sea Lamprey	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)
Allis Shad	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)

Site	**101**																				
Name of European Site:	**Noordzeekustzone SAC**																				
Distance to Norfolk Vanguard (km)	**98**																				
Twaite Shad	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)
Benthic habitats																					
Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination				
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D		
Sandbanks which are slightly covered by sea water all the time	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)			
Mudflats and sandflats not covered by seawater at low tide	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)			

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.
b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	102
Name of European Site:	Norfolk Valley Fens SAC
Distance to Norfolk Vanguard (km)	0.6+ (17 sites, with 5 sites within 5km of the onshore project area)

	Likely effect(s) of Norfolk Vanguard																							
	Direct effects (e.g. habitat loss) on land within 5km			Impacts on features outside 5km of the onshore project area			Impacts on ex-situ habitats functionally connected to the SAC			Disturbance due to groundwater / hydrology changes within 5km			Impacts from noise disturbance within 5km			Impacts from changing air quality within 5km			Impacts from light disturbance within 5km			Impacts from visual disturbance within 5km		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Alkaline fens	N(a)		N(a)	N(b)		N(b)	N(b)	N(b)	N(b)	**Y(c)**	**Y(c)**	**Y(c)**	N(e)		N(e)	**Y(c)**		**Y(c)**	N(e)		N(e)	N(e)		N(e)
Northern Atlantic wet heaths with *Erica tetralix*	N(a)		N(a)	N(b)		N(b)	N(b)	N(b)	N(b)	**Y(c)**	**Y(c)**	**Y(c)**	N(e)		N(e)	**Y(c)**		**Y(c)**	N(e)		N(e)	N(e)		N(e)
European dry heaths	N(a)		N(a)	N(b)		N(b)	N(b)	N(b)	N(b)	**Y(c)**	**Y(c)**	**Y(c)**	N(e)		N(e)	**Y(c)**		**Y(c)**	N(e)		N(e)	N(e)		N(e)
Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*)	N(a)		N(a)	N(b)		N(b)	N(b)	N(b)	N(b)	N(d)	N(d)	N(d)	N(e)		N(e)	N(d)		N(d)	N(e)		N(e)	N(e)		N(e)
Molinia meadows on calcareous,	N(a)		N(a)	N(b)		N(b)	N(b)	N(b)	N(b)	**Y(c)**	**Y(c)**	**Y(c)**	N(e)		N(e)	**Y(c)**		**Y(c)**	N(e)		N(e)	N(e)		N(e)

Site	102
Name of European Site:	Norfolk Valley Fens SAC
Distance to Norfolk Vanguard (km)	0.6+ (17 sites, with 5 sites within 5km of the onshore project area)

	Likely effect(s) of Norfolk Vanguard																							
	Direct effects (e.g. habitat loss) on land within 5km			Impacts on features outside 5km of the onshore project area			Impacts on ex-situ habitats functionally connected to the SAC			Disturbance due to groundwater / hydrology changes within 5km			Impacts from noise disturbance within 5km			Impacts from changing air quality within 5km			Impacts from light disturbance within 5km			Impacts from visual disturbance within 5km		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
peaty or clayey-silt-laden soils (*Molinion caeruleae*)																								
Calcareous fens with Cladium mariscus and species of the Caricion davallianae	N(a)		N(a)	N(b)		N(b)	N(b)	N(b)	N(b)	**Y(c)**	**Y(c)**	**Y(c)**	N(e)		N(e)	**Y(c)**		**Y(c)**	N(e)		N(e)	N(e)		N(e)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	N(a)		N(a)	N(b)		N(b)	N(b)	N(b)	N(b)	**Y(c)**	**Y(c)**	**Y(c)**	N(e)		N(e)	**Y(c)**		**Y(c)**	N(e)		N(e)	N(e)		N(e)
Narrow-mouthed whorl	N(a)		N(a)	N(b)		N(b)	N(b)	N(b)	N(b)	**Y(c)**	**Y(c)**	**Y(c)**	N(e)		N(e)	**Y(c)**		**Y(c)**	N(e)		N(e)	N(e)		N(e)

Site	102
Name of European Site:	Norfolk Valley Fens SAC
Distance to Norfolk Vanguard (km)	0.6+ (17 sites, with 5 sites within 5km of the onshore project area)

	Likely effect(s) of Norfolk Vanguard																							
	Direct effects (e.g. habitat loss) on land within 5km			Impacts on features outside 5km of the onshore project area			Impacts on ex-situ habitats functionally connected to the SAC			Disturbance due to groundwater / hydrology changes within 5km			Impacts from noise disturbance within 5km			Impacts from changing air quality within 5km			Impacts from light disturbance within 5km			Impacts from visual disturbance within 5km		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
snail																								
Desmoulin's whorl snail Vertigo moulinsiana	N(a)		N(a)	N(b)		N(b)	N(b)	N(b)	N(b)	N(d)	N(d)	N(d)	N(e)		N(e)	N(d)		N(d)	N(e)		N(e)	N(e)		N(e)

a) Direct impacts on features within 5km of the onshore project area have been screened out as they are beyond the range of potential direct impact.

b) Direct impacts on the features of the Norfolk Valley Fens SAC beyond 5km of the onshore project area have been screened out due to distance from the onshore project area. Effects of the project on ex-situ habitats functionally connected to the SAC have been screened out from further assessment as qualifying features of the SAC are all habitats or non-mobile species.

c) Potential indirect effects of Norfolk Vanguard on the Norfolk Valley Fens SAC are alterations to the groundwater/hydrology regime and air quality effect upon qualifying habitats of the SAC present within 5km of the onshore project area (5 component SSSIs have therefore been screened in to further assessment).

d) Feature is not located within the 5 sites within 5km of the onshore project area, therefore is not screened in for further assessment (see footnote (b)).

e) The qualifying features of the Norfolk Valley Fens SAC are not sensitive to noise, visual, or light disturbance and therefore there is no potential LSE and these have been screened out.

Site	103											
Name of European Site:	North Caithness Cliffs SPA											
Distance to Norfolk Vanguard (km)	708											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features fulmar, guillemot, kittiwake, razorbill, puffin		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding peregrine		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) North Caithness Cliffs SPA is far beyond the maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are small relative to BDMPS.
(b) Peregrines breeding in the UK normally remain close to their breeding areas throughout the year, and are very unlikely to migrate offshore from the UK.
(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at North Caithness Cliffs SPA.

Site	104											
Name of European Site:	North Norfolk Coast SPA and Ramsar											
Distance to Norfolk Vanguard (km)	80											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features wigeon, pink-footed goose, brent goose, knot, avocet		**Y (a)**		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (g)	**Y (a)**	N (g)
Breeding bittern		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (g)	N (g)	N (g)
Breeding marsh harrier		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (g)	N (g)	N (g)
Breeding avocet		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (g)	N (g)	N (g)
Breeding little tern, common tern, Sandwich tern		N (f)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (g)	N (g)	N (g)

(a) Following advice from Natural England, there is potential for connectivity during migration therefore LSE cannot be screened out.

(b) Survey data show little or no evidence of North Norfolk Coast SPA features wigeon, pink-footed goose, brent goose, knot, avocet occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration.

(c) Survey data show no evidence of North Norfolk Coast SPA feature bittern occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(d) Marsh harrier is a migrant species. Satellite tracking suggests that marsh harriers migrate overland to the south coast of England and over the Channel to France, rather than across the North Sea.

(e) Survey data show no evidence of North Norfolk Coast SPA feature avocet occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(f) Little tern, common tern and Sandwich tern have maximum foraging ranges from colonies of 11km, 30km and 54km respectively (Thaxter et al. 2012), so there is no connectivity between the SPA and Norfolk Vanguard site. Furthermore, these species tend to forage in coastal waters rather than offshore. Therefore, collision risk, displacement and barrier effects can be excluded.

(g) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at North Norfolk Coast SPA and Ramsar.

Site	105																	
Name of European Site:	North Norfolk Sandbanks and Saturn Reef SAC																	
Distance to Norfolk Vanguard (km)	2																	
Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Reefs	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
(a) The magnitude of any impact on the features of this site is negligible and would result in no potential for LSE.																		

Site	106											
Name of European Site:	Northumbria Coast SPA and Ramsar											
Distance to Norfolk Vanguard (km)	308											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding turnstone, purple sandpiper *Calidris maritima*		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding little tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Northumbria Coast SPA features (turnstone, purple sandpiper) occurring in the Norfolk Vanguard OWF sites, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Breeding little tern has a maximum foraging range of 11km from colonies (Thaxter *et al.* 2012), so would have no connectivity with Norfolk Vanguard. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Northumbria Coast SPA and Ramsar.

Site	107											
Name of European Site:	Noss SPA											
Distance to Norfolk Vanguard (km)	816											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features gannet, fulmar, guillemot, kittiwake, puffin, great skua		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Noss SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be extremely small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Noss SPA.

Site	108														
Name of European Site:	NTP S-H Wattenmeer und angrenzende Kustengebiete SAC														
Distance to Norfolk Vanguard (km)	365														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site Name of European Site: Distance to Norfolk Vanguard (km)	109 Oosterschelde SAC 130														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site Name of European Site: Distance to Norfolk Vanguard (km)	110 Orfordness - Shingle Street SAC 70																
Site Features	Likely effect(s) of Norfolk Vanguard																
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Coastal lagoons	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.																	

Site	111											
Name of European Site:	Östliche Deutsche Bucht SPA											
Distance to Norfolk Vanguard (km)	345											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding seabirds (razorbill, fulmar, black-throated diver, red-throated diver, herring gull, common gull, lesser black-backed gull, great black-backed gull, little gull, black-headed gull *Chroicocephalus ridibundus*, common scoter, great crested grebe, kittiwake, common tern, Arctic tern, sandwich tern, gannet, guillemot)		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site relative to the size of BDMPS regional populations, not only because the sites are 345km apart, but also because seabirds and waterbirds from this SPA are likely to migrate predominantly along the continental coast of the North Sea towards northern breeding grounds rather than across the southern North Sea.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Östliche Deutsche Bucht SPA.

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	C	O	D	C	O	C	O	D	C	O
Marine Mammals															
Harbour porpoise	N(c)	N(c)	N(c)				N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)
Grey seal	N(c)	N(c)	N(c)				N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)

Site	**111**															
Name of European Site:	**Östliche Deutsche Bucht SPA**															
Distance to Norfolk Vanguard (km)	**345**															
Harbour seal	N(c)	N(c)	N(c)				N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	
c) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.																

Site	**112**														
Name of European Site:	**Ouessant-Molene SAC**														
Distance to Norfolk Vanguard (km)	**698**														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	113											
Name of European Site:	Outer Thames Estuary SPA and pSPA extension											
Distance to Norfolk Vanguard (km)	21											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding red-throated divers		N (a)		N (b)	**Y (f)**	N (c)	N (a)	N (a)	N (a)	N (e)	**Y (f)**	N (e)
Breeding little tern and common tern		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)

(a) Red-throated divers fly close to the sea surface and are therefore at extremely low risk of collisions or barrier effects. Survey data indicate a negligible risk of collision mortality or of a barrier effect.

(b) Great Yarmouth may be used as a port for construction vessels for the Norfolk Vanguard site; this port is located very close to the northern extent of the SPA however is outside the main concentrations of red-throated divers. This, together with the extent of existing vessel movements in the area means the addition of construction traffic as a result of Norolk Vanguard will make little difference to the existing baseline and therefore the potential for LSE is considered to be negligible.

(c) Displacement/Disturbance during operation and decommissioning is considered negligible as the increase in vessel traffic within the SPA due to Norfolk Vanguard will be negligible compared to the existing baseline.

(d) Little tern and common tern have maximum foraging ranges from colonies of 11km and 30km respectively (Thaxter et al. 2012), which suggests there could be connectivity between the SPA and Norfolk Vanguard site, however this is the distance to the seaward edge of the SPA, and the coastal colonies are beyond foraging range of the Norfolk Vanguard OWF sites . Furthermore, these species tend to forage in coastal waters rather than offshore and since the breeding colonies are beyond foraging range connectivity can be ruled out. Therefore, collision risk, displacement and barrier effects can be excluded.

(e) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Outer Thames Estuary SPA.

(f) Following advice from Natural England it is considered that Operations and Maintenance vessels may disturb red-throated divers whilst transiting through the SPA therefore an LSE cannot be screened out.

Site	114														
Name of European Site:	Panache De La Gironde Et Plateau Rocheux De Cordouan (Système Pertuis Gironde) SAC														
Distance to Norfolk Vanguard (km)	837														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	115											
Name of European Site:	Papa Stour SPA											
Distance to Norfolk Vanguard (km)	851											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding Arctic tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding ringed plover		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)
(a) Papa Stour SPA is beyond maximum foraging range of Arctic tern so has no breeding season connectivity. The proportion of the population migrating through the Norfolk Vanguard site is very small relative to BDMPS. (b) Ringed plovers breeding in Scotland 'tend to winter locally or move only short distances' (Forrester *et al*. 2007) so birds from Papa Stour are extremely unlikely to reach the Norfolk Vanguard site. (c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Papa Stour SPA.											

Site	116											
Name of European Site:	Papa Westray (North Hill and Holm) SPA											
Distance to Norfolk Vanguard (km)	778											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding Arctic tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
Breeding Arctic skua		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Papa Westray SPA is beyond the maximum foraging range of Arctic tern or Arctic skua so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be extremely small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Papa Westray SPA.

Site	117
Name of European Site:	Paston Great Barn SAC
Distance to Norfolk Vanguard (km)	2.9

	Likely effect(s) of Norfolk Vanguard																							
	Direct effects (e.g. habitat loss) on land within the SAC			Direct effects on ex-situ habitats functionally connected to the SAC			Impacts from alterations to geology and land contamination			Disturbance due to groundwater / hydrology changes			Impacts from noise disturbance			Impacts from changing air quality			Impacts from light disturbance			Impacts from visual disturbance		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Barbastelle bats	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(b)	N(b)	N(b)	**Y(c)**	**Y(c)**	**Y(c)**	N(d)	N(d)	N(d)	N(d)		N(d)	**Y(e)**	**Y(e)**	**Y(e)**	N(d)	N(d)	N(d)

a) Paston Barn SAC is located 2.9km from the onshore project area; the SAC is therefore beyond the range of direct impact.

b) Barbastelle bats are associated with hedgerow, scrub, woodland and watercourse habitats which will not be affected by changes to the geology or land contamination regime.

c) Watercourses identified as core foraging areas for the Paston Great Barn barbastelle colony (i.e. drains at Ridlington Street) may be subject to trenching works during the project construction phase, and as such there may be effects upon this ex-situ habitat. Therefore LSE cannot be ruled out and these effects have been screened in for further assessment.

d) Qualifying features of Paston Great Barn SAC are not sensitive to potential effects from noise, visual disturbance or air quality and so indirect effects upon these qualifying features will not occur and these effects have been screened out of further assessment.

e) Barbastelle commuting and foraging habitat is located within the potential zone of influence of lighting from the onshore infrastructure and therefore LSE cannot be ruled out at the screening stage.

Site	118											
Name of European Site:	Pentland Firth Islands SPA											
Distance to Norfolk Vanguard (km)	716											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding Arctic tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Pentland Firth Islands SPA is beyond maximum foraging range of Arctic tern so has no breeding season connectivity. The proportion of the population migrating through the Norfolk Vanguard site is likely to be extremely small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Pentland Firth Islands SPA.

Site	119														
Name of European Site:	Pertuis Charentais SAC														
Distance to Norfolk Vanguard (km)	767														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	120											
Name of European Site:	Portsmouth Harbour SPA											
Distance to Norfolk Vanguard (km)	326											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding brent goose, dunlin, black-tailed godwit, red-breasted merganser		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Portsmouth Harbour SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.
(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Portsmouth Harbour SPA.

Site	121														
Name of European Site:	Presqu'ile De Crozon SAC														
Distance to Norfolk Vanguard (km)	700														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	122											
Name of European Site:	Ramsar-Gebiet S-H Wattenmeer und angrenzende Küstengebiete SPA											
Distance to Norfolk Vanguard (km)	365											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabirds including common gull, lesser black-backed gull, great black-backed gull, Mediterranean gull, black-headed gull, little tern, common tern, Arctic tern, Sandwich tern, black tern, gull-billed tern *Gelochelidon nilotica*		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (e)	N (e)	N (e)
Nonbreeding seabirds including razorbill, black-throated diver, red-throated diver, common gull, lesser black-backed gull, great black-backed gull, Mediterranean gull, black-headed gull, little gull, kittiwake, little tern, common tern, Arctic tern, Sandwich tern, cormorant, guillemot		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (e)	N (e)	N (e)
Waterbirds including pintail, shoveler, teal, wigeon, mallard, garganey *Anas querquedula*, grey heron *Ardea cinerea*, turnstone, bittern, brent goose, barnacle goose, sanderling, dunlin, curlew sandpiper, ringed plover, Kentish plover *Charadrius alexandrinus*, Bewick's swan, whooper swan, snipe *Gallinago gallinago*, oystercatcher, black-winged stilt *Himantopus himantopus*, bar-tailed godwit, black-tailed godwit, common		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (e)	N (e)	N (e)

Site	122											
Name of European Site:	Ramsar-Gebiet S-H Wattenmeer und angrenzende Küstengebiete SPA											
Distance to Norfolk Vanguard (km)	365											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
scoter, red-breasted merganser, curlew, whimbrel, ruff, spoonbill, golden plover, grey plover, red-necked grebe *Podiceps grisegena*, black-necked grebe *Podiceps nigricollis*, avocet, eider, shelduck, greenshank, redshank, lapwing												
Terrestrial birds (various species)		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (d)

(a) The Norfolk Vanguard site is beyond maximum foraging range of designated breeding seabird species from this SPA, so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be extremely small relative to BDMPS.

(b) Migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site relative to the size of BDMPS regional populations, not only because of the distance, but also because seabirds and waterbirds from this SPA are likely to migrate predominantly along the continental coast of the North Sea towards northern breeding grounds rather than across the southern North Sea.

(c) Survey data show little or no evidence of these waterbird features occurring in the Norfolk Vanguard OWF sites, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site, as most of these birds are likely to remain on the continental side of the North Sea.

(d) Terrestrial birds from this SPA are very unlikely to migrate to the UK; those that do migrate are more likely to follow the west European flyway along the continental coast.

(e) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at this SPA.

Site	123
Name of European Site:	Recifs Gris-Nez Blanc-Nez SAC
Distance to Norfolk Vanguard (km)	209

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard															
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination			
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	
Harbour (common) seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	

Benthic Habitats

Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Reefs	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.
b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	124
Name of European Site:	Ridens et dunes hydrauliques du detroit du Pas-de-Calais SAC
Distance to Norfolk Vanguard (km)	217

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard															
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination			
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	

Benthic Habitats

Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Reefs	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	125
Name of European Site:	River Derwent SAC
Distance to Norfolk Vanguard (km)	234

	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
River lamprey	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect from this site would result in no potential for LSE.

Site	126
Name of European Site:	River Wensum SAC
Distance to Norfolk Vanguard (km)	0

	Likely effect(s) of Norfolk Vanguard																							
	Direct effects (e.g. habitat loss) on land within the SAC boundary			Direct effects on ex-situ habitats functionally connected to the SAC			Impacts from alterations to geology and land contamination			Disturbance due to groundwater / hydrology changes			Impacts from noise disturbance			Impacts from changing air quality			Impacts from light disturbance			Impacts from visual disturbance		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	N(a)		N(a)	**Y(b)**		**Y(b)**	**Y(b)**	**Y(b)**	**Y(b)**	**Y(b)**	**Y(b)**	**Y(b)**	N(c)		N(c)	N(c)		N(c)	N(c)		N(c)	N(c)		N(c)
Desmoulin's whorl snail	N(a)		N(a)	**Y(b)**		**Y(b)**	**Y(b)**	**Y(b)**	**Y(b)**	**Y(b)**	**Y(b)**	**Y(b)**	N(c)		N(c)	N(c)		N(c)	N(c)		N(c)	N(c)		N(c)
White-clawed (or Atlantic stream) crayfish *Austropotamobius pallipes*	N(a)		N(a)	N(d)		N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)		N(d)	N(d)		N(d)	N(d)		N(d)	N(d)		N(d)
Brook lamprey *Lampetra planeri*	N(a)		N(a)	N(d)		N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)		N(d)	N(d)		N(d)	N(d)		N(d)	N(d)		N(d)
Bullhead *Cottus gobio*	N(a)		N(a)	N (d)		N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)		N(d)	N(d)		N(d)	N(d)		N(d)	N(d)		N(d)

a) The use of trenchless crossing techniques will ensure no direct effects upon any of the qualifying features of the SAC.

b) There may be potential effects on features which may be located outside of the SAC boundary but are within areas of land which are functionally connected to

Site	126
Name of European Site:	River Wensum SAC
Distance to Norfolk Vanguard (km)	0

the River Wensum SAC, including floodplain and grazing marsh habitat and therefore LSE cannot be ruled out at the screening stage.

c) The qualifying features of the River Wensum SAC are not sensitive to effects arising from these sources.

d) White-clawed crayfish was identified as absent at the trenchless crossing area at Elsing, therefore would not experience impacts associated with the construction in this area. Ex-situ habitats suitable for supporting brook lamprey and bullhead have not been identified within the onshore project area.

Site	127
Name of European Site:	Ronas Hill - North Roe and Tingon SPA
Distance to Norfolk Vanguard (km)	866

Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding great skua		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (d)	N (d)	N (d)
Breeding red-throated diver		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (d)	N (d)	N (d)
Breeding merlin		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (d)	N (d)	N (d)

(a) Ronas Hill, North Roe & Tingon SPA is beyond maximum foraging range of great skua so has no breeding season connectivity. The proportion of the population migrating through the Norfolk Vanguard site is likely to be extremely small relative to BDMPS.

(b) Ronas Hill, North Roe & Tingon SPA is beyond maximum foraging range of red-throated diver so has no breeding season connectivity. The proportion of the population migrating through the Norfolk Vanguard site is likely to be extremely small relative to BDMPS.

(c) Merlins from this population are likely to migrate to wintering areas that are predominantly within the UK. A few, mostly young birds, may winter on the European continent so could possibly pass through the Norfolk Vanguard site. However, no merlins have been seen during site specific surveys, and the chances of any from this SPA passing through the site are likely to be extremely low.

(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Ronas Hill, North Roe & Tingon SPA.

Site	128											
Name of European Site:	Rousay SPA											
Distance to Norfolk Vanguard (km)	763											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features guillemot, Arctic skua, Arctic tern, kittiwake, fulmar		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Rousay SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Rousay SPA.

Site	129														
Name of European Site:	Sandbanker ud for Thorsminde SAC														
Distance to Norfolk Vanguard (km)	492														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	130														
Name of European Site:	Sandbanker ud for Thyboron SAC														
Distance to Norfolk Vanguard (km)	523														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	131														
Name of European Site:	SBZ 1 / ZPS 1 SAC (off Nieuwpoort)														
Distance to Norfolk Vanguard (km)	170														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site Name of European Site: Distance to Norfolk Vanguard (km)	132 SBZ 2 / ZPS 2 SAC 156														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site Name of European Site: Distance to Norfolk Vanguard (km)	133 SBZ 3 / ZPS 3 SAC 153														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site Name of European Site: Distance to Norfolk Vanguard (km)	134 Scanner Pockmark SAC 591																	
Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Submarine structures made by leaking gases	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.																		

Site	135														
Name of European Site:	Schleswig-Holsteinisches Elbastuar und angrenzende Flachen SAC														
Distance to Norfolk Vanguard (km)	388														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	136											
Name of European Site:	Seevogelschutzgebiet Helgoland SPA											
Distance to Norfolk Vanguard (km)	343											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features razorbill, fulmar, herring gull, lesser black-backed gull, kittiwake, gannet, guillemot		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Nonbreeding seabird assemblage including razorbill, black-throated diver, red-throated diver, common gull, lesser black-backed gull, little gull, kittiwake, common scoter, red-necked grebe, eider,		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (c)	N (c)	N (c)

Site	136
Name of European Site:	Seevogelschutzgebiet Helgoland SPA
Distance to Norfolk Vanguard (km)	343

common tern, Arctic tern, Sandwich tern, gannet, guillemot												

(a) Tracking data from gannets breeding on Helgoland show these birds do not travel in the direction of or as far as the Norfolk Vanguard site despite this site being within theoretical maximum foraging range of gannet. Norfolk Vanguard is beyond the maximum foraging range of other seabird species at Seevogelschutzgebeit Helgoland SPA. Proportions of these populations migrating through Norfolk Vanguard are likely to be very small relative to BDMPS regional populations.

(b) Migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site during migration relative to the size of BDMPS regional populations, not only because the sites are 343km apart, but also because nonbreeding seabirds from this SPA are likely to migrate predominantly along the continental coast of the North Sea towards northern breeding grounds rather than across the southern North Sea.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Seevogelschutzgebeit Helgoland SPA.

Site	137
Name of European Site:	Skagens Gren og Skagerrak SAC
Distance to Norfolk Vanguard (km)	680

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	138											
Name of European Site:	Solent & Southampton Water SPA & Ramsar											
Distance to Norfolk Vanguard (km)	331											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding teal, brent goose, ringed plover, black-tailed godwit		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (d)	N (d)	N (d)
Breeding Mediterranean gull		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)
Breeding little tern, common tern, roseate tern, Sandwich tern		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Solent & Southampton Water SPA and Ramsar features occurring in the Norfolk Vanguard site, and migrations of birds from this site are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) No Mediterranean gulls were recorded in the Norfolk Vanguard site during bird surveys. This species is scarce in England, although increasing. Birds from the SPA are unlikely to migrate through the Norfolk Vanguard site. Thaxter et al. (2012) report the maximum foraging range of breeding Mediterranean gulls as 20km, so birds from this SPA will not have connectivity with the Norfolk Vanguard site during breeding.

(c) Little tern, common tern, roseate tern and Sandwich tern have maximum foraging ranges from colonies of 11km, 30km, 30km and 54km respectively (Thaxter et al. 2012), so there is no connectivity between the SPA and the Norfolk Vanguard site which are 331km apart. Furthermore, these species tend to forage in coastal waters rather than offshore. Therefore, collision risk, displacement and barrier effects can be excluded.

(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Solent & Southampton Water SPA and Ramsar.

Site	139														
Name of European Site:	Southern North Sea cSAC														
Distance to Norfolk Vanguard (km)	0														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	Y(a)	Y(a)	Y(a)	Y(a)	Y(a)	Y(a)	Y(a)	Y(a)	Y(a)	Y(a)		Y(a)	Y(a)	Y(a)	Y(a)
a) The offshore project area is within the cSAC and therefore LSE cannot be ruled out at the screening stage. It is assumed that all harbour porpoise in this area are associated with this cSAC.															

Site	140											
Name of European Site:	St Abb's Head to Fast Castle SPA											
Distance to Norfolk Vanguard (km)	438											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features herring gull, kittiwake, razorbill, guillemot, shag		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)
(a) St Abbs Head to Fast Castle SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS. (b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at St Abbs Head to Fast Castle SPA.												

Site Name of European Site: Distance to Norfolk Vanguard (km)	141 Steingrund SAC 353														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site Name of European Site: Distance to Norfolk Vanguard (km)	142 Store Rev SCI 654														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	143											
Name of European Site:	Stour & Orwell Estuaries SPA and Ramsar											
Distance to Norfolk Vanguard (km)	119											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features pintail, wigeon, gadwall, turnstone, brent goose, goldeneye, dunlin, knot, ringed plover, black-tailed godwit, curlew, cormorant, grey plover, great crested grebe, shelduck, redshank, lapwing		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding avocet		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Stour & Orwell Estuaries SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Survey data show no evidence of Stour & Orwell Estuaries SPA feature avocet occurring in the Norfolk Vanguard OWF sites, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Stour & Orwell Estuaries SPA and Ramsar.

Site	144											
Name of European Site:	Sumburgh Head SPA											
Distance to Norfolk Vanguard (km)	791											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features kittiwake, fulmar, guillemot, Arctic tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Sumburgh Head SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Sumburgh Head SPA.

Site	145														
Name of European Site:	Sydlige Nordsø SAC														
Distance to Norfolk Vanguard (km)	367														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	**146**
Name of European Site:	**Sylter Außenriff SCI**
Distance to Norfolk Vanguard (km)	**311**

Ornithology

Site Features	Likely effect(s) of Norfolk Vanguard											
		Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
		C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding seabird assemblage including black-throated diver, red-throated diver, common gull, lesser black-backed gull, great black-backed gull, little gull, gannet, kittiwake, common tern, Arctic tern, Sandwich tern, guillemot			N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

Marine mammals

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Underwater noise			Underwater noise			Underwater noise			Underwater noise		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)		N (c)	N (c)	N (c)	N (c)
Grey seal	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)		N (c)	N (c)	N (c)	N (c)
Harbour seal	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)		N (c)	N (c)	N (c)	N (c)

Site	**146**
Name of European Site:	**Sylter Außenriff SCI**
Distance to Norfolk Vanguard (km)	**311**

Fish																					
Site Features	Likely effect(s) of Norfolk Vanguard																				
	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
River lamprey	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)
Twaite shad	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)

a) Migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site relative to the size of BDMPS regional populations, not only because the sites are 311km apart, but also because nonbreeding seabirds from this SPA are likely to migrate predominantly along the continental coast of the North Sea towards northern breeding grounds rather than across the southern North Sea.

b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Sylter Außenriff SPA.

c) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	147											
Name of European Site:	Teesmouth and Cleveland Coast SPA and Ramsar											
Distance to Norfolk Vanguard (km)	289											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding knot, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (d)	N (d)	N (d)
Nonbreeding Sandwich tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (d)	N (d)	N (d)
Breeding little tern		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Teesmouth & Cleveland Coast SPA features knot or redshank occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Nonbreeding Sandwich terns at Teesmouth & Cleveland Coast SPA may migrate between the SPA and wintering areas off west Africa. This could take them near to Norfolk Vanguard. However, very few terns of any species were seen in the Norfolk Vanguard site during bird surveys, and the Sandwich tern tends to migrate close to the coast where that is possible, so there are unlikely to be significant numbers reaching the Norfolk Vanguard site. The few that do will have a very low collision risk due to their generally low flight height and displacement/barrier effects will be negligible in the context of a migration of thousands of kilometres.

(c) Breeding little tern has a maximum foraging range of 11km from colonies (Thaxter et al. 2012), so would have no connectivity with Norfolk Vanguard. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Teesmouth & Cleveland Coast SPA and Ramsar.

Site	148											
Name of European Site:	Thames Estuary and Marshes SPA and Ramsar											
Distance to Norfolk Vanguard (km)	188											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features dunlin, knot, ringed plover, black-tailed godwit, grey plover, avocet, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Nonbreeding hen harrier		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (c)	N (c)	N (c)

(a) Survey data show little or no evidence of Thames Estuary & Marshes SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Survey data show no evidence of hen harrier occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site, as the species is likely to migrate overland rather than over sea where the option is available.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Thames Estuary & Marshes SPA and Ramsar.

Site	149											
Name of European Site:	Thanet Coast and Sandwich Bay SPA and Ramsar											
Distance to Norfolk Vanguard (km)	171											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding turnstone, golden plover		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding little tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Thanet Coast & Sandwich Bay SPA features turnstone or golden plover occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Breeding little tern has a maximum foraging range of 11km from colonies (Thaxter et al. 2012), so would have no connectivity with the Norfolk Vanguard site. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the Norfolk Vanguard site.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Thanet Coast & Sandwich Bay SPA and Ramsar.

Site Name of European Site:	150 Thanet Coast SAC																	
Distance to Norfolk Vanguard (km)	170																	
Site Features	Likely effect(s) of Norfolk Vanguard																	
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Mudflats and sandflats not covered by seawater at low tide	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Reefs	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
(a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.																		

Site	151											
Name of European Site:	The Broads SAC											
Distance to Norfolk Vanguard (km)	3.6											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Direct effects within SAC boundary			Direct effects on ex-situ habitats			Indirect effects within SAC boundary			Indirect effects on ex-situ habitats		
	C	O	D	C	O	D	C	O	D	C	O	D
Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp.*	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	**Y (e)**	**Y (e)**	**Y (e)**	N (b)	N (b)	N (b)
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	**Y (e)**	**Y (e)**	**Y (e)**	N (b)	N (b)	N (b)
Transition mires and quaking bogs	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	**Y (e)**	**Y (e)**	**Y (e)**	N (b)	N (b)	N (b)
Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [Priority feature]	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	**Y (e)**	**Y (e)**	**Y (e)**	N (b)	N (b)	N (b)
Alkaline fens	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	**Y (e)**	**Y (e)**	**Y (e)**	N (b)	N (b)	N (b)
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [Priority feature]	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	**Y (e)**	**Y (e)**	**Y (e)**	N (b)	N (b)	N (b)
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)	**Y (e)**	**Y (e)**	**Y (e)**	N (b)	N (b)	N (b)
Desmoulin's whorl snail	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)	**Y (e)**	**Y (e)**	**Y (e)**	N (c)	N (c)	N (c)
Fen orchid	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)	**Y (e)**	**Y (e)**	**Y (e)**	N (c)	N (c)	N (c)

Site	151											
Name of European Site:	The Broads SAC											
Distance to Norfolk Vanguard (km)	3.6											
Ramshorn snail	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)	**Y (e)**	**Y (e)**	**Y (e)**	N (c)	N (c)	N (c)
Otter	N (a)	N (a)	N (a)	**Y (d)**	**Y (d)**	**Y (d)**	**Y (e)**	**Y (e)**	**Y (e)**	**Y (d)**	**Y (d)**	**Y (d)**

a) The Broads SAC is located 3.6km from the onshore project area; the SAC is therefore beyond the range of potential impact.

b) The Annex I qualifying features of The Broads SAC are habitats and not mobile species, and as such are restricted primarily to the SAC boundary. As such, these are beyond the range of potential impact.

c) Habitats within the onshore project area and within 5km of The Broads SAC are not suitable for supporting these species.

d) Suitable habitats for supporting otter were recorded within the project area and within 5km of The Broads SAC. Otters have large ranges and may commute from The Broads SAC into the onshore project area and therefore LSE cannot be ruled out at the screening stage.

e) The potential zone of influence for effects arising from local changes in surface and groundwater encompasses watercourses located within 5km of the Broads SAC. Therefore, indirect effects upon qualifying features of The Broads SAC within the onshore project area arising from local changes in surface and groundwater hydrology are screened in for further assessment.

Site	152											
Name of European Site:	The Swale SPA & Ramsar											
Distance to Norfolk Vanguard (km)	187											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features brent goose, dunlin, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of The Swale SPA and Ramsar features occurring in the Norfolk Vanguard site, and migrations of birds from this site are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at The Swale SPA and Ramsar.

Site	**153**
Name of European Site:	**The Wash and North Norfolk Coast SAC**
Distance to Norfolk Vanguard (km)	**80 (33km from offshore cable corridor)**

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard																
	Underwater noise			Vessel Interactions/ disturbance at seal haul out sites			Indirect effects on prey			Changes to water quality			In combination				
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D		
Harbour seal	N(a)	N(a)	N(a)	**Y (b)**	**Y (b)**	**Y (b)**	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)		

Benthic Habitats

Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Mudflats and sandflats not covered by seawater at low tide	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Large shallow inlets and bays	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)

a) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

b) Potential for vessel interactions and disturbance at seal haul-out sites if a port to the north of the offshore project area is selected and therefore LSE cannot be ruled out.

Site	**154**											
Name of European Site:	**The Wash SPA and Ramsar**											
Distance to Norfolk Vanguard (km)	**120**											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features pintail, wigeon, gadwall, pink-footed goose, turnstone, brent goose, goldeneye, sanderling, dunlin, knot, Bewick's swan, oystercatcher, bar-tailed godwit, black-tailed godwit, common scoter, curlew, grey plover, shelduck, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding little tern, common tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of The Wash SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Little tern and common tern have maximum foraging ranges from colonies of 11km and 30km respectively (Thaxter et al. 2012), so there is no connectivity between the SPA and Norfolk Vanguard site which are 120km apart. Furthermore, these species tend to forage in coastal waters rather than offshore. Therefore, collision risk, displacement and barrier effects can be excluded.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at The Wash SPA and Ramsar.

Site	155														
Name of European Site:	Thyboron Stenvolde SCI														
Distance to Norfolk Vanguard (km)	506														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site Name of European Site: Distance to Norfolk Vanguard (km)	156 Tregor Goëlo SAC 571														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	157											
Name of European Site:	Troup, Pennan and Lion`s Heads SPA											
Distance to Norfolk Vanguard (km)	597											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features razorbill, fulmar, guillemot, kittiwake, herring gull		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) Troup, Pennan & Lion's Heads SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Troup, Pennan & Lion's Heads SPA.

Site	158														
Name of European Site:	Unterelbe SCI														
Distance to Norfolk Vanguard (km)	388														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site Name of European Site: Distance to Norfolk Vanguard (km)	159 Unterems und Aussenems SCI 263														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site Name of European Site: Distance to Norfolk Vanguard (km)	160 Vadehavet med Ribe Å, Tved Å og Varde Å vest for Varde SAC 418														
Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)
a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.															

Site	161
Name of European Site:	Vlaamse Banken SAC
Distance to Norfolk Vanguard (km)	138

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions and disturbance at seal haul outs			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Harbour seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Grey seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

Fish

Site Features	Likely effect(s) of Norfolk Vanguard																				
	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sea Lamprey	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)

Site	161																					
Name of European Site:	Vlaamse Banken SAC																					
Twaite Shad	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)
Benthic habitats																						
Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination					
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D			
Reefs	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)			
Sandbanks which are slightly covered by sea water all the time	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)	N(b)			

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.
b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	**162**
Name of European Site:	**Vlakte van de Raan SCI/SAC**
Distance to Norfolk Vanguard (km)	**135**

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour porpoise	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Grey seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)
Harbour seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

Fish

Site Features	Likely effect(s) of Norfolk Vanguard																				
	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sea Lamprey	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)
River lamprey	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)

Site	**162**
Name of European Site:	**Vlakte van de Raan SCI/SAC**
Distance to Norfolk Vanguard (km)	**135**

Twaite Shad	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	**163**
Name of European Site	**Voordelta SPA and SAC**
Distance to Norfolk Vanguard (km)	**106**

Ornithology													
Site Features	Likely effect(s) of Norfolk Vanguard												
		Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
		C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbirds including cormorant, shelduck, ringed plover, dunlin, goldeneye, sanderling, little gull, eider, great crested grebe, greylag goose, Sandwich tern, avocet, gadwall, Slavonian grebe, spoonbill, red-breasted merganser, pintail, red-throated diver, bar-tailed godwit, oystercatcher, shoveler,			N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N(a)	N (b)	N (b)	N (b)

Site	163
Name of European Site	Voordelta SPA and SAC
Distance to Norfolk Vanguard (km)	106

wigeon, turnstone, scaup, redshank, common tern, teal, curlew, grey plover, common scoter																					
Marine mammals																					
Site Features	Likely effect(s) of Norfolk Vanguard																				
	Underwater noise			Underwater noise			Underwater noise			Underwater noise			Underwater noise								
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D						
Harbour seal	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)		N (c)	N (c)	N (c)	N (c)						
Grey seal	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (c)		N (c)	N (c)	N (c)	N (c)						
Fish																					
Site Features	Likely effect(s) of Norfolk Vanguard																				
	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sea lamprey	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)

Site	163
Name of European Site	Voordelta SPA and SAC
Distance to Norfolk Vanguard (km)	106

River lamprey	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)
Allis shad	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)
Twaite shad	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)	N(c)

Benthic Habitats

Site Features	Likely effect(s) of Norfolk Vanguard																		
	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)	N(d)

a) Survey data show little or no evidence of Voordelta SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.
b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Voordelta SPA.
c) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.
d) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	164											
Name of European Site:	Waddenzee (Wadden Sea) SPA											
Distance to Norfolk Vanguard (km)	111											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features lesser black-backed gull, little tern, common tern, Arctic tern, Sandwich tern		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (d)	N (d)	N (d)
Breeding waterbirds including Kentish plover, ringed plover, marsh harrier, spoonbill, avocet		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (d)	N (d)	N (d)
Wintering and passage waterbirds including pintail, shoveler, teal, wigeon, mallard, gadwall, greylag goose, bean goose *Anser fabalis*, turnstone, scaup, brent goose, barnacle goose, goldeneye, sanderling, dunlin, knot, curlew sandpiper, ringed plover, black tern *Chlidonias niger*, hen harrier, Bewick's swan, oystercatcher, bar-tailed godwit, black-tailed godwit, red-breasted		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (d)	N (d)	N (d)

Site	164											
Name of European Site:	Waddenzee (Wadden Sea) SPA											
Distance to Norfolk Vanguard (km)	111											
merganser, goosander, curlew, cormorant, spoonbill, golden plover, grey plover, great crested grebe, avocet, eider, shelduck, greenshank, redshank, lapwing												

(a) The Norfolk Vanguard site is far beyond the mean maximum foraging range of designated breeding seabird species from this SPA, so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be extremely small relative to BDMPS, not only because of the distance, but also because birds from this SPA are likely to use the west European flyway along the continental coast rather than crossing the southern North Sea. Lesser black-backed gull tracking has shown breeding birds do not cross the North Sea therefore no connectivity is expected for this species.

(b) Survey data show little or no evidence of Waddenzee SPA breeding waterbird features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(c) Survey data show little or no evidence of Waddenzee SPA nonbreeding waterbird features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(d) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Waddenzee SPA.

Site	165
Name of European Site:	Waddenzee SAC
Distance to Norfolk Vanguard (km)	111

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard															
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination			
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	
Grey seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	
Harbour seal	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)	N(a)		N(a)	N(a)	N(a)	N(a)	

Benthic Habitats

Site Features	Permanent loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminate d sediments			Underwater noise and vibration			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Sandbanks which are slightly covered by sea water all the time	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Estuaries	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)
Mudflats and sandflats not covered by seawater at low tide	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)		N (b)	N (b)		N (b)	N (b)	N (b)	N (b)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

b) The distance between the offshore project area and the designated site is beyond the range of any potential LSE.

Site	166											
Name of European Site:	West Westray SPA											
Distance to Norfolk Vanguard (km)	773											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding seabird assemblage including as named features kittiwake, Arctic tern, fulmar, razorbill, Arctic skua, guillemot		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (b)	N (b)	N (b)

(a) West Westray SPA is beyond maximum foraging range of designated seabird species so has no breeding season connectivity. Proportions of these populations migrating through the Norfolk Vanguard site are likely to be very small relative to BDMPS.

(b) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at West Westray SPA.

Site	**167**
Name of European Site:	**Westerschelde & Saeftinghe SAC**
Distance to Norfolk Vanguard (km)	**141**

Marine Mammals

Site Features	Likely effect(s) of Norfolk Vanguard														
	Underwater noise			Vessel Interactions			Indirect effects on prey			Changes to water quality			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Harbour seal	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)		N (a)	N (a)	N (a)	N (a)

Fish

Site Features	Likely effect(s) of Norfolk Vanguard																				
	Permanent habitat loss			Temporary physical disturbance			Smothering due to increased suspended sediment			Re- mobilisation of contaminated sediments			Underwater noise and vibration			Electromagnetic fields (EMF)			In combination		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
River lamprey	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)
Twaite Shad	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (a)

a) The distance between the potential impact range of Norfolk Vanguard and the extent of any effect on individuals from this site would result in no potential for LSE.

Site	168											
Name of European Site:	Ythan Estuary, Sands of Forvie and Meikle Loch SPA											
Distance to Norfolk Vanguard (km)	556											
Site Features	Likely effect(s) of Norfolk Vanguard											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Wintering and passage waterbird assemblage including as named features lapwing, eider, pink-footed goose, redshank		N (a)		N (a)	N (a)	N (a)	N (a)	N (a)	N (a)	N (c)	N (c)	N (c)
Breeding little tern, common tern, Sandwich tern		N (b)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (b)

(a) Survey data show little or no evidence of Ythan Estuary, Sands of Forvie & Meikle Loch SPA features occurring in the Norfolk Vanguard site, and migrations of birds from this SPA are likely to result in negligible numbers passing through the Norfolk Vanguard site.

(b) Little tern, common tern and Sandwich tern have maximum foraging ranges from colonies of 11km, 30km and 54km respectively, so there is no connectivity between the SPA and Norfolk Vanguard site which are 556km apart. Furthermore, these species tend to forage in coastal waters rather than offshore. Therefore, collision risk, displacement and barrier effects can be excluded.

(c) The predicted effect attributable to Norfolk Vanguard is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Ythan Estuary, Sands of Forvie & Meikle Loch SPA.