



The Planning Inspectorate Yr Arolygiaeth Gynllunio

The Planning Act 2008

Norfolk Boreas Offshore Wind Farm

Examining Authority's Report
of Findings and Conclusions

and

Recommendation to the Secretary of State for
Business, Energy and Industrial Strategy

Examining Authority

Frances Fernandes BSc, MSc, MRTPI; Lead Panel Member

Stephen Bradley BA, DipArch, MSc, RIBA

Peter Braithwaite BSc MSc DIC CEng CEnv CRWM FICE MCIWM

Annie Coombs BA, MA, MSc, FLI

Menaka Sahai DipArch, MSc (Urban Design), MSc (Planning), MRTPI, FRSA

12 JANUARY 2021

This page is intentionally blank

OVERVIEW

File Ref: EN010087

The application, dated 11 June 2019, was made under section 37 of the Planning Act 2008 and was received in full by The Planning Inspectorate on 11 June 2019.

The Applicant is Norfolk Boreas Limited, a wholly owned subsidiary of Vattenfall Wind Power Limited.

The application was accepted for examination on 4 July 2019.

The Examination of the application began on 12 November 2019 and was completed on 12 October 2020.

The Proposed Development would comprise construction of an offshore wind generating station of up to 1800 megawatts (MW) installed capacity including up to 158 wind turbine generators each fixed to the seabed and an offshore substation, a cable connection to the shore at Happisburgh in north Norfolk, an onshore substation and electricity transmission system connection at Necton in west Norfolk. The Proposed Development would cover an area of approximately 725 km² located in the southern North Sea approximately 73km from the Norfolk coast at its closest point to land. The landfall cable connection would have an underground cable route approximately 60km in length to connect to the Necton National Grid substation.

Summary of Recommendation:

The Examining Authority recommends that the Secretary of State should withhold consent. If, however the Secretary of State decides to give consent, then the Examining Authority recommends that the Order should be in the form attached at Annex D.

REPORT TABLE OF CONTENTS

OVERVIEW.....	i
REPORT TABLE OF CONTENTS.....	ii
1. INTRODUCTION	1
1.1. INTRODUCTION.....	1
1.2. THE APPLICATION.....	1
1.3. LOCATION	2
1.4. PROPOSED DEVELOPMENT	4
1.5. CONCLUSION	6
2. EXAMINATION PROCESS	7
2.1. APPOINTMENT OF THE EXAMINING AUTHORITY	7
2.2. THE PERSONS INVOLVED IN THE EXAMINATION	7
2.3. THE EXAMINATION AND PROCEDURAL DECISIONS.....	7
2.4. ENVIRONMENTAL IMPACT ASSESSMENT	14
2.5. HABITATS REGULATIONS ASSESSMENT.....	15
2.8. CONCLUSIONS	15
3. LEGAL AND POLICY CONTEXT.....	16
3.1. INTRODUCTION.....	16
3.2. THE PLANNING ACT 2008 (AS AMENDED) AND NPSs.....	16
3.3. UK CLIMATE CHANGE ACT 2008 (as amended)	17
3.4. MARINE AND COASTAL ACCESS ACT 2009	17
3.5. EUROPEAN LAW AND RELATED UK REGULATIONS	17
3.6. OTHER LEGAL PROVISIONS	19
3.7. MADE DEVELOPMENT CONSENT ORDERS	22
3.8. TRANSBOUNDARY EFFECTS	22
3.9. OTHER RELEVANT POLICY STATEMENTS	22
3.10. THE SECRETARY OF STATE'S POWERS TO MAKE A DCO.....	23
3.11. CONCLUSIONS	23
4. PROJECT-WIDE MATTERS	24
4.1. INTRODUCTION.....	24
4.2. PRINCIPAL ISSUES.....	24
4.3. RELEVANT PLANNING HISTORY	25
4.4. NEED FOR DEVELOPMENT	26
4.5. ENVIRONMENTAL STATEMENT AND ENVIRONMENTAL IMPACT ASSESSMENT.....	30
4.6. CONCLUSION	34
5. FINDINGS AND CONCLUSIONS IN RELATION TO THE PLANNING ISSUES.....	36
5.1. INTRODUCTION.....	36
ONSHORE MATTERS.....	39
5.2. TRAFFIC AND TRANSPORTATION	39
5.3. LANDSCAPE AND VISUAL EFFECTS	60
5.4. ONSHORE CONSTRUCTION EFFECTS	105

5.5.	NOISE AND VIBRATION	119
5.6.	TERRESTRIAL BIODIVERSITY, BIOLOGICAL ENVIRONMENT, AND ECOLOGY	129
5.7.	WATER RESOURCES AND FLOOD RISK	142
5.8.	SOCIO-ECONOMIC	162
	OFFSHORE MATTERS.....	184
5.9.	OFFSHORE MARINE BIODIVERSITY, BIOLOGICAL ENVIRONMENT AND ECOLOGY	184
5.10.	MARINE AND COASTAL PROCESSES	228
5.11.	COMMERCIAL FISHERIES AND FISHING.....	235
	OTHER MATTERS	250
5.12.	AIR QUALITY.....	250
5.13.	AVIATION AND RADAR.....	250
5.14.	CLIMATE CHANGE	254
5.15.	GRID CONNECTION.....	261
5.16.	HERITAGE MATTERS AND ONSHORE ARCHAEOLOGY.....	266
5.17.	NAVIGATION AND SHIPPING.....	272
5.18.	OFFSHORE ARCHAEOLOGY AND HERITAGE ASSETS.....	280
5.19.	OTHER OFFSHORE INFRASTRUCTURE AND ACTIVITIES	290
5.20.	TRANSBOUNDARY EFFECTS	293
5.21.	WASTE MANAGEMENT STRATEGY	294
5.22.	CUMULATIVE EFFECTS AND INTER-RELATIONSHIPS	299
5.23.	CONCLUSIONS IN RELATION TO THE PLANNING ISSUES	309
6.	FINDINGS AND CONCLUSIONS IN RELATION TO HABITATS REGULATIONS ASSESSMENT	310
6.1.	INTRODUCTION.....	310
6.2.	PROJECT LOCATION IN RELATION TO RELEVANT EUROPEAN SITES.....	311
6.3.	HRA IMPLICATIONS OF THE PROJECT	311
6.4.	ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS (LSE).....	312
6.5.	CONSERVATION OBJECTIVES.....	326
6.6.	FINDINGS IN RELATION TO ADVERSE EFFECTS ON THE INTEGRITY (AEoI) OF EUROPEAN SITES	326
6.7.	CONSIDERATION OF ALTERNATIVE SOLUTIONS.....	419
6.8.	IMPERATIVE REASONS OF OVERRIDING PUBLIC INTEREST (IROPI).....	423
6.9.	COMPENSATORY MEASURES.....	424
6.10.	HRA CONCLUSIONS	431
7.	CONCLUSION ON THE CASE FOR DEVELOPMENT CONSENT	433
7.1.	INTRODUCTION.....	433
7.2.	THE PLANNING BALANCE	433
7.3.	FINDINGS AND CONCLUSIONS IN RELATION TO PLANNING ISSUES.....	434
7.4.	OVERALL FINDINGS AND CONCLUSIONS ON THE CASE FOR DEVELOPMENT CONSENT.....	448
8.	COMPULSORY ACQUISITION AND RELATED MATTERS	451
8.1.	INTRODUCTION.....	451
8.2.	THE REQUEST FOR CA AND RELATED POWERS	451

8.3.	THE PURPOSES FOR WHICH POWERS ARE SOUGHT	453
8.4.	THE REQUIREMENTS OF PA 2008.....	455
8.5.	HOW THE ExA EXAMINED THE CASE FOR CA (AND TP)	456
8.6.	CONSIDERATION OF REASONABLE ALTERNATIVES TO CA.....	457
8.7.	TEMPORARY POSSESSION	457
8.8.	AVAILABILITY AND ADEQUACY OF FUNDING	458
8.9.	COMPELLING CASE IN THE PUBLIC INTEREST FOR COMPULSORY ACQUISITION s122(3)	461
8.10.	HUMAN RIGHTS.....	462
8.11.	THE EQUALITY ACT 2010	463
8.12.	THE DEVELOPMENT CONSENT ORDER	463
8.13.	COMPULSORY ACQUISITION OBJECTIONS SCHEDULE (CAOS)	465
8.14.	SPECIAL CATEGORY LAND	465
8.15.	STATUTORY UNDERTAKERS LAND (s127 & s138)	470
8.16.	INDIVIDUAL OBJECTIONS RECEIVED TO COMPULSORY ACQUISITION AND OTHER MATTERS	479
8.17.	EXA's CONSIDERATION OF THE CA ISSUES	497
8.18.	CONCLUSIONS	499
9.	DRAFT DEVELOPMENT CONSENT ORDER AND RELATED MATTERS	501
9.1.	INTRODUCTION.....	501
9.2.	THE dDCO AS APPLIED FOR.....	501
9.3.	CHANGES TO THE dDCO DURING EXAMINATION	502
9.4.	COMPARISON OF DIFFERENCES BETWEEN dDCO AND rDCO	504
9.5.	OTHER rDCO MATTERS	540
9.6.	OTHER CONSENTS	542
9.7.	OTHER AGREEMENTS	542
9.8.	CONCLUSION	543
10.	SUMMARY OF FINDINGS AND CONCLUSIONS.....	545
10.1.	INTRODUCTION.....	545
10.2.	CONSIDERATION OF FINDINGS AND CONCLUSIONS.....	545
10.3.	RECOMMENDATION.....	547
APPENDIX A: EXAMINATION LIBRARY.....		
APPENDIX B: LIST OF ABBREVIATIONS		
APPENDIX C: COMPULSORY ACQUISITION OBJECTIONS SCHEDULE		
APPENDIX D: THE RECOMMENDED DCO.....		



The Planning Inspectorate

ERRATA SHEET – Norfolk Boreas Reference – EN010087

Examining Authority's Report of Findings and Conclusions and Recommendation to the Secretary of State for Business, Energy and Industrial Strategy, dated 12 January 2021.

Corrections agreed by the Examining Authority prior to a decision being made

Paragraph	Error	Correction
P ii Table of Contents	2.6 and 2.7 missing from the table	Insert entries
3.5.7	Missing reference to the Conservation of Offshore Marine Habitats and Species Regulations 2017	Insert reference (suggest defining both sets of regulations together as "the Habitats Regulations")
3.5.12	Extra space before final full stop.	Remove space
4.3.4	Unnecessary comma in first sentence	Delete comma
4.5.19, footnote 3	"in with"	Delete "in"
5.1.11	8 th bullet point – "using an approach, to"	Delete comma (or insert additional wording before it)
5.2.31	In penultimate sentence "share live feed shared"	Delete either "share" or "shared"
5.2.32	"to Examination (first line)	Insert "the" after "to"
5.2.46	Repeated sentence "The ExA is satisfied ... at this location."	Delete one instance of the sentence.
5.2.47 g.	"Proposed development"	Capitalise "development"
5.3.17	"[APP-532]"	Change to "[APP-532]"
5.3.72	"Church Lane"	Change to "Church Road"
5.3.54	Reference to "Figures 5.3.1 and 5.3.1 below"	Change to "5.3.32 and 5.3.4"
5.4.39	Final words of the para "R(20)(4)"	Delete parentheses around "20" to change to "R20(4)"
5.4.67	"Old Railway gatehouse" in 6 th line	Capitalise to "Gatehouse"
5.4.75	In line 3 "NSP"	Change to "NPS"

Paragraph	Error	Correction
5.5.51	"NPS-EN1" (final line)	Change to "NPS EN-1".
5.8.24	Indirect employment effect figures have been transposed between the schemes	Change Scenario 1 figure to 0.59% and Scenario 2 figure to 0.72%.
5.9.111	"Cretaceans"	Cetaceans
5.9.167	Possible missing space in "ProjectsThree" in the penultimate line	Insert space if necessary
5.9.173	Missing full stop between "NE" and "The" on line 6.	Insert "."
5.9.238	"Cretaceans"	Cetaceans
5.9.250 (e)	Incomplete sentence	Add "- test has been passed." at the end of the sentence
5.9.252	"significant weight"	Change "significant" to "substantial"
5.10.13 b	"reduces total amount of area"	Insert "the" between "reduces" and "total"
5.11.36	Unnecessary full stop after "720m" on line 4.	Delete full stop so sentence ends "720m to 800m".
5.11.41	Unnecessary colon at the end of the sentence and unnecessary paragraph break between 5.11.41 and 5.11.42	Delete colon and paragraph break
5.13.16	Missing full stop between <i>agreed requirements</i> and These	Insert "."
5.15.14	"requirement to coordinated"	Change "coordinated" to "coordinate"
5.15.16	"and Proposed Development" (fifth line)	Insert "the" after "and"
5.16.21	Repetition of "that the"	Delete repetition
5.16.35	"significant adverse effects"	Change to "non-significant adverse effects"
5.17.31	Reference to "Norfolk Boreas" on the final line.	Change to "Norfolk Vanguard".
5.19.9	Repeated "a decommissioning plan"	Delete the instance at the end of the penultimate sentence
5.19.9	"if" in final line	Replace with "of"
5.21.13	Space before full stop at the end of the paragraph	Delete the space
5.21.26	In a. – "post-contract"	Change to "post-consent"
5.21.30	In b. – "post-contract"	Change to "post-consent"
6.6.49	"expended"	Change to "expendable"
6.6.138	4 th sentence "from alone"	Delete "from"
6.6.138	Penultimate sentence "follows therefore than"	Change "than" to "that"
6.6.172	Final sentence "if effects"	Change to "if the effects of"
6.6.205	Reference to "gannet" (x2)	Change to "guillemot"

Paragraph	Error	Correction
6.6.217	“offshore OWFs”	Delete “offshore”
6.6.249	Heading is missing a comma	Insert comma after “Haisborough”
6.6.270	“micro-siting.of”	Replace “.” with a space
6.6.445	Missing “be” in final line	Insert to read “would be no”
Heading above 6.9.14	Title of SPA incorrect – “Filey and Flamborough Coast SPA”	Correct to “Flamborough and Filey Coast SPA”
6.9.19	“Associated British Port”	Change to “Associated British Ports”
7.3.7	“NPS-EN-1” (final line)	Delete hyphen between “NPS” and “EN”
7.3.8	“require need” (11 th line)	Delete either word.
7.3.42	Missing full stop	Insert full stop between “paints” and “While” on line 6
7.4.13	Missing comma	Insert comma between “site” and “the” on line 3
8.14.12	“of National Trust’s” (penultimate line)	Insert “the” after “of”
8.15.6	“National Grids”	Change to “National Grid’s”
8.15.43	“was agreed was agreed”	Delete repetition
8.15.48 (line 4)	“undertakers”	Change to “undertaker’s”
8.16.15	Reference to “Table 1”	Should be a reference to “Table 8.16.1”
8.16.16	Reference to “Table 2”	Should be a reference to “Table 8.16.2”
8.16.13	Missing apostrophe	Should be “objector’s”

1. INTRODUCTION

1.1. INTRODUCTION

1.1.1. The structure of this report is as follows:

- **Chapter 1** introduces the reader to the application and describes the location of the application and its surrounds.
- **Chapter 2** provides an overview of the processes used to carry out the Examination including the effect of the Covid-19 pandemic.
- **Chapter 3** records the principal legal and policy context for the decision of the Secretary of State, BEIS (SoS).
- **Chapter 4** considers the need case underpinning the application and the framework within which the Environmental Impact Assessment (EIA) was undertaken. It reviews relevant planning history and the Applicant's approach to assessing cumulative effects.
- **Chapter 5** sets out findings and conclusions in relation to the main matters in the Examination.
- **Chapter 6** considers effects on European Sites and Habitats Regulations Assessment (HRA).
- **Chapter 7** sets out the balance of planning considerations arising from Chapters 4 and 5, in the light of the factual, legal and policy information in Chapters 1 to 3.
- **Chapter 8** sets out the Examining Authority's (ExA's) examination of Compulsory Acquisition (CA) and Temporary Possession (TP) proposals.
- **Chapter 9** considers the implications of the matters arising from the preceding chapters for the Development Consent Order (DCO).
- **Chapter 10** summarises all relevant considerations and sets out the ExA's recommendation to the SoS.

1.1.2. This report is supported by the following Appendices:

- **Appendix A** – the Examination Library.
- **Appendix B** – List of Abbreviations.
- **Appendix C** – Compulsory Acquisition Objections Schedule.
- **Appendix D** – the Recommended DCO

1.2. THE APPLICATION

1.2.1. The Applicant for the Proposed Development is Norfolk Boreas Limited.

1.2.2. The application is for an Order granting development consent for the construction and operation of an offshore wind farm of generating capacity of up to 1,800 megawatts (MW). It would comprise up to 158 wind turbines and associated offshore and onshore infrastructure.

1.2.3. The application was received by the Planning Inspectorate on 11 June 2019 and the SoS for the Ministry of Housing, Communities and Local Government (MHCLG) accepted the application for examination under s55 of the Planning Act 2008 (as amended) (PA2008) on 4 July 2019 [PD-001].

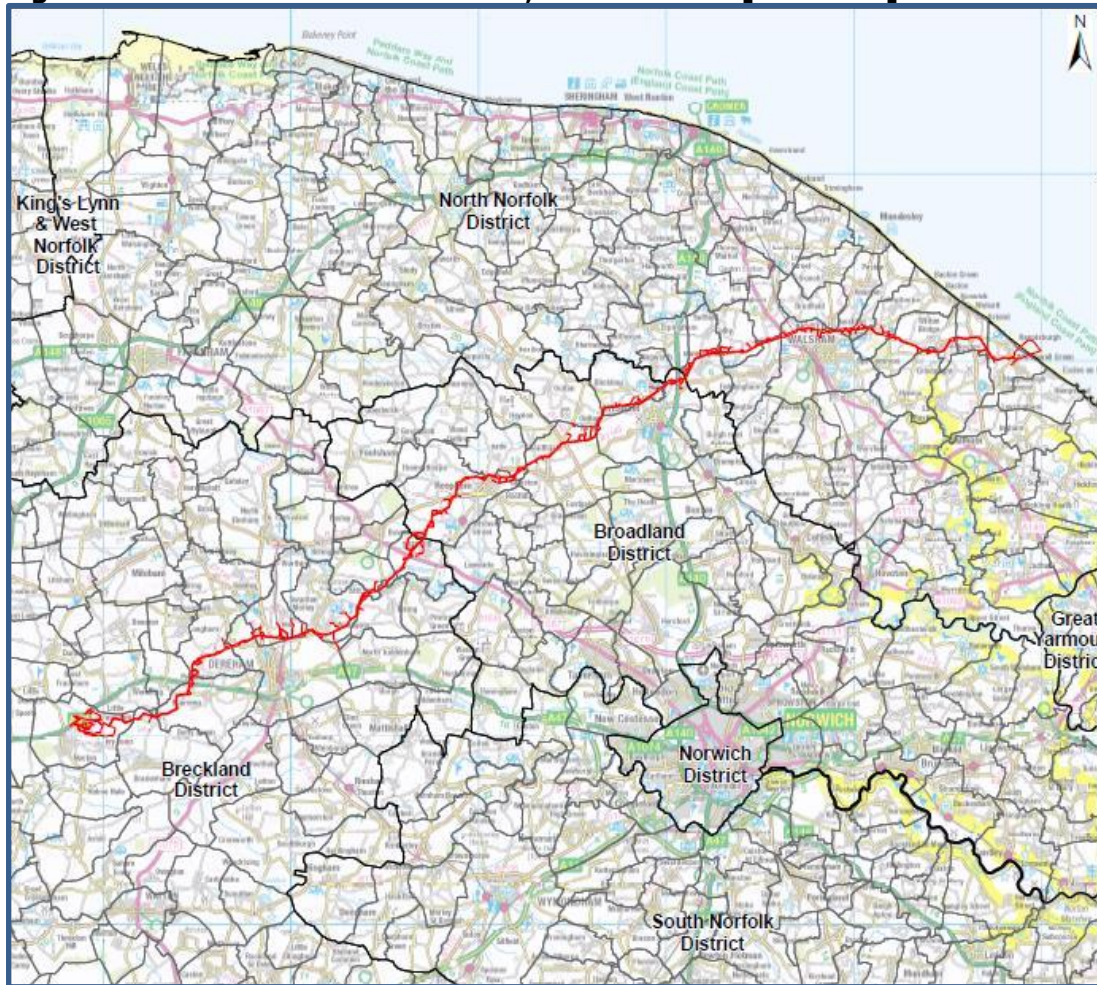
- 1.2.4. As the application is for an offshore generating station with a capacity greater than 100MW, it is considered a Nationally Significant Infrastructure Project (NSIP) under s14(1)(a) and s15(3) of the PA2008.
- 1.2.5. The main application documents comprise:
- a. Application Form [APP-002];
 - b. Plans [APP-006] to [APP-019];
 - c. Draft Development Consent Order [APP-020] and Explanatory Memorandum [APP-021];
 - d. Note of Requirements and Conditions in the Development Consent Order [APP-022];
 - e. Statement of Reasons [APP-024], Funding Statement [APP-025] and Book of Reference [APP-026];
 - f. Consultation Report [APP-027];
 - g. Environmental Statement [APP-214] to [APP-247]; and
 - h. Habitats Regulations Assessment [APP-201].

1.3. LOCATION

Onshore location of the Proposed Development

- 1.3.1. The onshore elements of the Proposed Development are located within the local authorities of Breckland Council, Broadland District Council and North Norfolk District Council, and within the county of Norfolk in the East of England [APP-006]. The figure below illustrates the location of the proposed onshore cable corridor in relation to the boundaries of the three local authorities.

Figure 1.3.1: Onshore Order Limits, extract from [APP-428]



- 1.3.2. The onshore underground cable route (approximately 60km in length) of the Proposed Development would connect the landfall location at Happisburgh on the east coast of Norfolk with the onshore project substation and National Grid substation extension just east of the village of Necton in Breckland District. The cable route would pass mainly through agricultural land, skirting towns and villages along the route. Construction routes required for the Proposed Development would pass through the settlements of Cawston and Oulton, in Broadland District.

The offshore application site

- 1.3.3. The offshore elements of the Proposed Development (Figure 2.1.1) would be situated approximately 73km from the North Norfolk coast landfall location at Happisburgh, in the District of North Norfolk, occupying a development area which would be approximately 725km² [APP-006]. The figure below illustrates the location of the proposed Offshore Wind Farm (OWF) array, project interconnector search area and offshore cable corridor in relation to part of the coastline of north-east Norfolk. The project interconnector search area would allow for installing project interconnectors (cables) connecting an offshore electrical platform or turbines within the Proposed Development with an electrical platform located within one of the adjacent sites comprising the Norfolk Vanguard OWF, for which an Order has been made.

Landfall

- 1.3.4. The landfall location at Happisburgh South comprises a stretch of coastline approximately 0.25km from Beach Road in the north to Upton Way in the south and extends approximately 500m inland within agricultural land to enable cable transition pits to be located back from the shoreline which is subject to coastal erosion. The offshore export cables would be installed using long Horizontal Directional Drilling (HDD) under the cliff and to exit in the subtidal zone approximately 1km from the onshore drilling location to avoid impacts on the intertidal zone.

Figure 1.3.2: Offshore Project Areas, extract from [APP-265]



1.4. PROPOSED DEVELOPMENT

- 1.4.1. The Applicant puts forward two scenarios in its application [APP-218]:
- Scenario 1 – The Norfolk Vanguard OWF project would proceed to construction first, and would install ducts onshore and other shared works enabling the Proposed Development as summarised below; and
 - Scenario 2 – The Norfolk Vanguard OWF project does not proceed to construction and the Proposed Development would proceed alone. The Proposed Development would undertake all works required to connect it to the national electricity transmission grid as an independent project.
- 1.4.2. As such, some of the proposed works are the same in both scenarios, whilst others are unique to Scenario 1 or Scenario 2.
- 1.4.3. In summary the main offshore elements of the application comprise:
- a. an offshore wind turbine generating station with an electrical export capacity of up to 1,800MW which includes one offshore

- service platform, up to two meteorological masts, up to two LIDAR measurement buoys and up to two wave measurement buoys;
- b. a network of subsea array cables and fibre optic cables between the wind turbine generators. (Work No. 1 for both scenarios); and
- c. Scenario 1 only would also include a network of subsea cables and fibre optic cables connecting the turbines to an offshore electrical platform within Norfolk Vanguard OWF East.

1.4.4. The draft DCO (dDCO) also makes provision for Associated Development, Further Associated Development and Ancillary Works, as summarised below.

Associated Development

1.4.5. Offshore Associated Development comprises up to two further electrical platforms, a network of subsea cables and fibre optic cables and up to four subsea export cables and fibre optic cables (Work No. 2, 3A, 4A for both scenarios). Scenario 1 only would also include up to three interconnector cables and fibre optic cables (Work No. 3B).

1.4.6. Associated Development in the intertidal area would comprise up to four subsea export cables and fibre optic cables between mean low water springs (MLWS) and mean high water springs (MHWS) at Happisburgh South (Work No. 4B).

1.4.7. Associated Development onshore would comprise:

- a. up to two transition jointing pits and up to four cables and fibre optic cables laid in ducts from MHWS (Work No. 4C for both scenarios);
- b. up to four cables and fibre optic cables pulled through existing ducts (for Scenario 1: Work No. 5(a) - District of North Norfolk, No. 6(a) - District of Broadland, No. 7(a) - District of Breckland);
- c. up to four cables and fibre optic cables laid in ducts underground (for Scenario 2: Work No. 5(b) - District of North Norfolk, No. 6(b) - District of Broadland, No. 7(b) - District of Breckland);
- d. an onshore project substation and associated water management, bunding and landscape works and up to 12 interface cables and fibre optic cables laid underground (Work No. 8A, 8B, 9 for both scenarios and access connections, Work No. 12A for Scenario 1 and Work No. 12B for Scenario 2) - all in the District of Breckland;
- e. National Grid substation extension, surface water management and landscape works (Work No. 10A(a), 10B(a), 10C for Scenario 1 and Work No. 10B(a), 10B(b), 10C for Scenario 2 - District of Breckland); and
- f. removal of one pylon and construction of two new pylons and fittings (Work No. 11A for Scenario 1), overhead line modifications (Work No. 11B for Scenario 2) - District of Breckland.

Further Associated Development

1.4.8. Offshore Further Associated Development would comprise scour protection, cable protection, removal of seabed material and disposal of arisings, cable installation preparation and excavation of HDD exit pits.

- 1.4.9. Onshore Further Associated Development would comprise works associated with construction onshore, associated mitigation measures, habitat creation and archaeological works and, under Scenario 2, temporary overhead line diversion local to the Necton National Grid substation.

Ancillary Works

- 1.4.10. Ancillary Works would comprise offshore and onshore (in all local authorities) temporary works to facilitate construction and/or maintenance of the authorised development or protect land or structures affected by the authorised development.

1.5. CONCLUSION

- 1.5.1. This chapter has provided an overview of the application. Chapter 2 considers the way in which the Examining Authority (ExA) examined the application.

2. EXAMINATION PROCESS

2.1. APPOINTMENT OF THE EXAMINING AUTHORITY

- 2.1.1. On 20 September 2019, Frances Fernandes, Lead Panel Member, along with panel members Peter Braithwaite, Annie Coombs and Menaka Sahai were appointed as Examining Authority (ExA) for the Application under s61 and s65 of the Planning Act 2008 as amended (PA2008) [PD-004].
- 2.1.2. On 7 October 2019, Stephen Bradley joined as the fifth panel member under s65(1)(a) of PA2008 [PD-005].

2.2. THE PERSONS INVOLVED IN THE EXAMINATION

- 2.2.1. The persons involved in the Examination were:
- a. persons who were entitled to be Interested Parties (IPs) because they had made a relevant representation (RR) or were a statutory party who requested to become an IP;
 - b. Affected Persons (APs) who were affected by a Compulsory Acquisition (CA) and/or Temporary Possession (TP) proposal made as part of the application and objected to it at any stage in the Examination; and
 - c. Other Persons, who were invited to participate in the Examination through invitation to the Preliminary Meeting by the ExA because they were either affected by it in some other relevant way or because they had particular expertise or evidence that the ExA considered to be necessary to inform the Examination.
- 2.2.2. The Planning Inspectorate received representations from parties that were not registered Interested Parties, Affected Persons or Other Persons. The ExA used its discretion to accept these representations.

2.3. THE EXAMINATION AND PROCEDURAL DECISIONS

- 2.3.1. On 4 July 2019, the Planning Inspectorate issued s51 advice [PD-002] following the acceptance of the application. The advice concerned issues noted by the Inspectorate with regard to the Habitats Regulations Assessment (HRA), non-consultation of relevant bodies and discrepancies in the Book of Reference (BoR).

The Preliminary Meeting

- 2.3.2. On 11 October 2019, the ExA wrote to all IPs, Statutory Parties and Other Persons under Rule 6 of the Infrastructure Planning (Examination Procedure) Rules 2010 (EPR) (the Rule 6 letter) [PD-006] inviting them to the Preliminary Meeting, an Open Floor Hearing (OFH) and two Issue Specific Hearings (ISHs) as well as outlining:

- a. the arrangements and agenda for the PM;
- b. notification of hearings to be held in the early stage of the Examination;
- c. an Initial Assessment of Principal Issues (IAP);
- d. the draft Examination Timetable;
- e. availability of RRs and application documents; and
- f. the ExA's procedural decisions.

2.3.3. The Examination began on 12 November 2019. The principal components and events of the Examination are summarised below.

Procedural decisions

- 2.3.4. The ExA made additional procedural decisions in the Rule 6 letter [PD-006] which called for updates of certain documents to be submitted and nominations for places to be visited on Unaccompanied Site Inspections (USIs) and Accompanied Site Inspections (ASIs).
- 2.3.5. On 19 November 2019, under Rule 8 of the EPR (the Rule 8 letter) [PD-007], the ExA provided details of additional procedural decisions, including issuing the Examination Timetable, the ExA's first written questions (WQ1), as well as procedural decisions on Statements of Common Ground (SoCGs), Local Impact Reports (LIRs) and ASIs.
- 2.3.6. On 19 March 2020, due to Government guidance for social distancing as part of the response to the Covid-19 pandemic, under Rule 8(3) of the EPR, the ExA made the decision to postpone the ISH on onshore effects including the dDCO, the Compulsory Acquisition Hearing (CAH) and the ASI scheduled for that week [PD-013]. The ExA also decided to postpone hearings for which dates had been reserved of 14-16 April 2020.
- 2.3.7. On 28 April 2020 the ExA issued a fourth round of written questions and, under Rule 8(3) of the EPR, the ExA varied the Examination Timetable creating a new deadline (Deadline 11) for responses to answers from the fourth round of written questions [PD-015].

Extension of Examination due to effects of the Covid-19 pandemic

- 2.3.8. Examination of the Proposed Development was significantly disrupted due to the Covid-19 coronavirus pandemic and the effects of measures taken across the UK to curb the impact of the pandemic. The ExA was obliged to cancel a week of programmed hearings.
- 2.3.9. The last day of the Examination was due to be 11 May 2020. However, on 6 April 2020, the Planning Inspectorate requested from the SoS an extension to the Examination period for no longer than five months, following a number of requests for an extension made to the ExA by IPs and others. The main reasons stated in these requests were:
- due to Government guidelines in relation to Covid-19 several hearings needed to be cancelled potentially resulting in IPs not being given a fair opportunity to participate in the Examination; and

- a number of IPs no longer had the capacity to participate in the Examination process as a result of Covid-19 resource prioritisation.

- 2.3.10. On 11 May 2020, the SoS agreed to extend the Examination by five months to enable a full and fair process to be conducted; and agreed to the new timescales which meant that the Examination period was reset to end on or before 12 October 2020. The SoS stated that this would be confirmed in a Written Ministerial Statement [OD-012].
- 2.3.11. On 19 May 2020, under Rule 8(3) of the EPR [PD-017], the ExA updated the Examination timetable to include an additional round of written questions (WQ5) and the addition of dates and reserved dates for two 'virtual' OFHs and a 'virtual' ISH.
- 2.3.12. The Examination timetable was subsequently altered twice to enable OFHs and ISHs to take place 'virtually' by electronic means at a distance; and the ExA issued three rounds of additional questions and five Rule 17 requests. The ExA laid particular emphasis in its communications with IPs that while the NSIP examination process under PA2008 was primarily a written process (and therefore any lack of ability to participate in hearings via electronic means did not preclude people from making their representations), a great deal of planning and preparation was put into running 'virtual hearings' in such a way that all participants could build confidence that they could participate and communicate on a fair and equal footing.
- 2.3.13. Amongst the measures taken to ensure fairness and equality of participation, people were given an opportunity to test their communications and familiarise themselves with technology and processes prior to the hearing itself; participants were able to take part by telephone if unable to benefit from a video connection; and hearings had an audio-visual recording made available publicly within a short period of time via the Planning Inspectorate website, to watch and listen to any aspects of the hearings 'on demand' before submitting any further written representation.

Site inspections

- 2.3.14. Site inspections were conducted to ensure that the ExA has an adequate understanding of how the Proposed Development would relate to its site and surroundings and its potential physical and spatial effects, as follows.

Unaccompanied Site Inspections (USIs)

- 2.3.15. USIs were conducted where the matters for inspection could be viewed from the public domain and there were no other considerations such as personal safety or the need for the identification of relevant features or processes.
- 2.3.16. USIs had regard to issues raised by RRs as well as enabling the ExA to obtain views of locations relevant to the construction and operation of the Proposed Development. Regard was also given to the verified viewpoints contained in the Environmental Statement (ES). The ExA held

five USIs and the dates, times and locations of the places the ExA visited are recorded in a published note of USIs [EV2-004]:

- a. 30 September 2019;
- b. 01 October 2019;
- c. 11 November 2019;
- d. 20 January 2020; and
- e. 16 March 2020.

Accompanied Site Inspections (ASIs)

- 2.3.17. ASIs were held where there was a requirement for consent to access land, safety or other technical considerations or where the ExA accepted a request to accompany an inspection.
- 2.3.18. The first ASI was undertaken on 23 January 2020. The full itinerary was published on 15 January 2020 [EV8-001]. The ExA and Planning Inspectorate staff were joined by the Applicant (at all locations) and IPs at each location. In and around Necton, attendees included Necton Parish Council, Necton Substation Action Group and the landowners of Ivy Todd Farm and Bradenham Hall Farms. In and around Cawston, the attendees included Norfolk County Council, Broadland District Council and Cawston Parish Council as well as local residents [EV8-002].
- 2.3.19. A second ASI was scheduled for 19 March 2020 and the full itinerary was published on 12 March 2020 [EV8-003]. This ASI was postponed on 17 March 2020 as a consequence of the public health situation surrounding the coronavirus pandemic and was not rearranged before the close of the Examination due to the restrictions ensuing from the ongoing pandemic.
- 2.3.20. In all relevant sections of this Recommendation Report the ExA has had regard to what it observed and what was pointed out during its site inspections.

Hearing Processes

- 2.3.21. Hearings were held in the following circumstances:
 - a. ISHs to address matters where the ExA considered that a hearing is necessary to inquire orally into matters under examination, typically because they are complex, there is an element of contention or disagreement, or the application of relevant law or policy is not clear; and
 - b. to respond to specific requests from persons who have a right to be heard, in summary terms as follows:
 - where persons affected by CA and/or TP proposals (Affected Persons) object and request to be heard at a CAH; and/or
 - where IPs request to be heard at an OFH.
- 2.3.22. A variety of different hearings were held during the course of the Examination as set out in the following table.

Table 2.3.1: Hearings Held

Hearing Ref	Date Held	EL Reference
ISH1 – Draft DCO	13 November 2019	Agenda [EV3-001]
OFH1	13 November 2019	
ISH2 – Environmental Matters including HRA	14 November 2019	Agenda [EV5-001]
ISH3 – Onshore Effects including Draft DCO	21 January 2020	Agenda [EV6-001]
ISH4 – Offshore Effects including Draft DCO	22 January 2020	Agenda [EV7-001]
Virtual OFH2	02 July 2020	Agenda [EV12-001]
Virtual OFH3	14-17 July 2020	Agenda [EV13-001]
Virtual ISH5	21-24 July 2020	Agenda [EV14-001], updated [EV14-002]

2.3.23. A fifth ISH was programmed to be held on 17 March 2020. The full agenda for the ISH was published on 11 March 2020 [EV9-001]. This Hearing did not take place due to the coronavirus pandemic and was subsequently dealt with via the written process and through the 'virtual hearing' ISH5 held in July 2020.

2.3.24. A CAH was programmed to be held on 18 March 2020. The full agenda was published on 11 March 2020 [EV10-001]. This Hearing did not take place due to the coronavirus pandemic with matters being dealt with via the written process.

2.3.25. OFH2 was programmed to be held on the evening of 15 April 2020. This Hearing did not take place due to the coronavirus pandemic and was replaced by 'virtual hearings' OFH2 and OFH3 in July 2020.

Written processes

2.3.26. Examination under the PA2008 is primarily a written process, in which the ExA has regard to written material forming the application and evidence submitted by IPs during the Examination. All of this material is listed in the Examination Library (Appendix A) and published online. Individual document references to the Examination Library in this

Recommendation Report are enclosed in square brackets []. The Examination Library also contains links to all audio and video recordings from the Preliminary Meeting and the hearings.

- 2.3.27. For this reason, this Recommendation Report does not contain extensive summaries of all documents and representations, although full regard has been had to them in the ExA's consideration of matters arising and conclusions.

Relevant Representations

- 2.3.28. At total of 113 RRs were received by the Planning Inspectorate [RR-001 to RR-113]. All RRs have been fully considered by the ExA. The issues raised and examined are discussed in subsequent chapters of this Recommendation Report.

Written Representations and Other Examination Documents

- 2.3.29. The Applicant and IPs and Other Persons were provided with opportunities to make Written Representations (WRs) and other representations throughout the Examination. All WRs and other Examination documents have been fully considered by the ExA.

Local Impact Reports

- 2.3.30. A Local Impact Report (LIR) is a report made by a relevant local authority giving details of the likely impact of the Proposed Development on the area.
- 2.3.31. LIRs were received by the ExA from the following relevant local authorities:
- a. Breckland Council [REP2-062];
 - b. Broadland District Council (Broadland DC) [REP2-065];
 - c. North Norfolk District Council (NNDC) [REP2-087]; and
 - d. Norfolk County Council (NCC) [REP2-085]
- 2.3.32. The LIRs have been taken fully into account by the ExA in this Recommendation Report.

Statements of Common Ground

- 2.3.33. A Statement of Common Ground (SoCG) is a statement agreed between an applicant and one or more IPs, recording matters that are agreed or not agreed between them.
- 2.3.34. By the end of the Examination, the following parties had concluded SoCGs with the Applicant as referenced below, noting emails confirmations received. Matters of disagreement are reported in subsequent chapters.
- a. Anglian Water Services (Anglian Water) [REP16-006];
 - b. Breckland Council [REP11-017] and confirmatory email [REP16-016];
 - c. Broadland DC [REP10-036] and confirmatory email [REP17-017];

- d. Eastern Inshore Fisheries Conservation Authority [REP9-019] and confirmatory email [REP16-032];
- e. Environment Agency [REP16-007] and confirmatory email [REP17-007];
- f. Highways England [REP16-008];
- g. Historic England [REP9-022] and confirmatory email [REP16-033];
- h. Marine Management Organisation [REP16-009];
- i. Natural England [REP16-010] and [REP16-011 Offshore Ornithology];
- j. Maritime and Coastguard Agency [REP9-024] and confirmatory email [REP17-009];
- k. National Federation of Fishermen's Organisations and VisNed [REP9-025] and confirmatory email [REP11-022];
- l. Norfolk County Council [REP16-012] and confirmatory email [REP16-034];
- m. North Norfolk District Council [REP10-040] and confirmatory email [REP18-034];
- n. Ørsted Hornsea Project Three [REP18-031] and confirmatory email [REP18-037];
- o. Royal Yachting Association [REP9-027] and confirmatory email [REP17-013];
- p. The National Farmers Union [REP18-031];
- q. The Royal Society for the Protection of Birds [REP16-014] and confirmatory email [REP17-012];
- r. The Wildlife Trusts and Norfolk Wildlife Trusts [REP9-030];
- s. Trinity House [REP9-028] and confirmatory letter [REP17-014];
- t. UK Chamber of Shipping [REP9-018] and confirmatory email [REP17-015]; and
- u. Whale and Dolphin Conservation [REP9-029].

Written Questions

- 2.3.35. The ExA asked five rounds of written questions (WQs).
- a. First WQs (WQ1) [PD-008] and procedural decisions were set out in the Rule 8 letter [PD-007], both dated 19 November 2019.
 - b. Further WQs (WQ2) [PD-009] were issued on 12 February 2020.
 - c. Third WQs (WQ3) [PD-014] were issued on 23 March 2020.
 - d. Fourth WQs (WQ4) [PD-016] were issued on 28 April 2020.
 - e. Fifth WQs (WQ5) [PD-022] were issued on 11 August 2020.
- 2.3.36. All responses and comments on responses to the ExA's WQs have been fully considered and taken into account in all relevant Chapters of this Recommendation Report.

Requests for Further Information

- 2.3.37. The following requests for further information and comments under Rule 17 of the EPR were issued:
- a. a Rule 17 request on 27 February 2020 [PD-012], as several discrepancies had been identified regarding the Broadland Special Protection Area (SPA) and Ramsar site, Breydon Water SPA and Ramsar site and North Norfolk Coast SPA and Ramsar site;

- b. a Rule 17 request on 28 April 2020 [PD-015] for responses to WQ4 by a new deadline (Deadline 11) and submission of a final version of the Note on Requirements and Conditions in the Development Consent Order at Deadline 11 with a revised timetable was included under Rule 8(3) of EPR;
- c. a Rule 17 request on 19 May 2020 [PD-017] for the completion of a questionnaire needed for involvement in the '*virtual hearings*';
- d. a Rule 17 request on 17 July 2020 [PD 021], requesting further information from IPs due to amended approach to ISH5;
- e. a Rule 17 request on 18 August 2020 [PD 023], requesting further information from IPs;
- f. a Rule 17 request on 10 September 2020 [PD 025], directing further questions to IPs; and
- g. a Rule 17 request on 08 October 2020 [PD 026], requesting the Applicant to provide an updated Schedule of Mitigation.

2.3.38. All responses to the ExA's requests for further information have been fully considered and taken into account in all relevant Chapters of this Report.

Requests to join and leave the Examination

2.3.39. There were a number of requests to join the Examination by persons who were not already IPs at or after the PM. The ExA exercised its discretion in dealing with these requests.

2.3.40. The Examination finally closed at 11.59 on 12 October 2020. In its notification of closure, the ExA thanked all parties for their continued involvement over the extended timescale of the Examination [PD-027].

2.4. ENVIRONMENTAL IMPACT ASSESSMENT

2.4.1. The Proposed Development is development for which an Environmental Impact Assessment (EIA) is required (EIA development).

2.4.2. On 9 May 2017, the Applicant provided a notification to the Planning Inspectorate (the Inspectorate) under Regulation 6(1)(b) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 that it intended to provide an ES. The Applicant also requested that the SoS should provide an opinion on the scope of the proposed ES under Regulation 8 of the 2009 EIA Regulations.

2.4.3. Subsequently, in October 2018 the Applicant notified the Inspectorate under Regulation 8(1)(b) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 2017 EIA Regulations) that it intended to provide an ES which complied with the requirements of the 2017 Regulations. A Scoping Opinion [APP-687] was issued by the Inspectorate for the SoS on 16 June 2017. It follows that the Applicant is deemed to have notified the SoS under Regulation 8(1)(b) that it proposed to provide an ES in respect of the Proposed Development. The application was accompanied by an ES on 11 June 2019.

2.4.4. On 4 September 2019 the Applicant provided the Inspectorate with certificates confirming that s56 and s59 of PA2008 and Regulation 16 of the 2017 EIA Regulations had been complied with [OD-001].

2.4.5. Consideration is given to the adequacy of the ES in Section 4.5 and matters arising from it in Chapter 5 of this Recommendation Report.

2.5. HABITATS REGULATIONS ASSESSMENT

2.5.1. The Proposed Development is development for which a Habitats Regulations Assessment (HRA) Report has been provided [APP-201 to APP-205 inclusive].

2.5.2. Consideration is given to the adequacy of the HRA Report, associated information and evidence and the matters arising from it in Chapter 6 of this Recommendation Report.

2.6. OTHER CONSENTS

2.6.1. The application documentation and submissions during this Examination have identified consents that the Applicant has obtained or that the undertaker would need to obtain, in addition to the DCO. These fall into two categories:

- those consented as part of the DCO process; and
- those for which approvals would be sought post-consent of the DCO, which are listed in the Applicant's application document 'Consents and Licenses Required under Other Legislation' [REP2-003].

2.7. THE APPLICATION AS EXAMINED

2.7.1. To assist with navigation of its documents and show which documents had been superseded or supplemented the Applicant submitted a 'Guide to the Application', which was updated throughout the examination. The final version was submitted at Deadline 18, on 12 October 2020 [REP18-002].

2.8. CONCLUSIONS

2.8.1. This chapter has considered the way in which the Examining Authority (ExA) examined the application. Chapter 3 considers relevant policies and legislation taken into account by the ExA in carrying out its Examination.

3. LEGAL AND POLICY CONTEXT

3.1. INTRODUCTION

3.1.1. This chapter sets out the relevant policies and principal international and domestic legislation which was taken into account by the ExA in carrying out its Examination of this Proposed Development and in making its findings and recommendations to the Secretary of State (SoS) for Business, Energy and Industrial Strategy (BEIS) as the relevant decision maker for a renewable energy NSIP DCO application under s14 of the Planning Act 2008 (as amended) (PA2008).

3.1.2. The Applicant's Environmental Statement, Chapter 3: Policy and Legislative Context [APP-216] outlines the international, national, regional and local legal and policy contexts to which the Applicant has had regard. The Applicant's Planning Statement also sets out key planning policies relating to the Proposed Development [APP-693].

3.2. THE PLANNING ACT 2008 (AS AMENDED) AND NPSs

3.2.1. The Planning Act 2008 (as amended) (PA 2008) is the governing legislation for the development consent decision for this application.

3.2.2. Given that there are National Policy Statements (NPSs) in effect in relation to the Proposed Development, the decision on the application must be made pursuant to s104 of PA2008 (where an NPS has effect).

3.2.3. Under s104, the matters that the SoS must consider are:

- any NPS which has effect in relation to development of the description to which the application relates;
- the appropriate marine policy documents (if any), determined in accordance with s59 of the Marine and Coastal Access Act 2009;
- any local impact report (within the meaning given by s60(3) of the PA2008) submitted to the SoS before the specified deadline for submission;
- any matters prescribed in relation to development of the description to which the application relates; and
- any other matters which the SoS thinks are both important and relevant to the decision.

3.2.4. Section 104(3) requires the SoS to decide the application in accordance with any relevant NPS, creating a presumption in favour of NPS compliant development except to the extent that one or more of the exceptions in subsections (4) to (8) apply. The exceptions are as follows and apply if the SoS is satisfied that:

- a. deciding the application in accordance with any relevant NPS would lead to the United Kingdom being in breach of any of its international obligations;
- b. deciding the application in accordance with any relevant national policy statement would lead to the SoS being in breach of any duty imposed on them by or under any enactment;

- c. deciding the application in accordance with any relevant national policy statement would be unlawful by virtue of any enactment;
- d. the adverse impact of the proposed development would outweigh its benefits; and/or
- e. any condition prescribed for deciding an application otherwise than in accordance with a NPS is met.

3.2.5. The relevant NPSs for decision-making on this Proposed Development are:

- Overarching NPS for Energy (NPS EN-1);
- NPS for Renewable Energy Infrastructure (NPS EN-3); and
- NPS for Electricity Networks Infrastructure (NPS EN-5).

3.2.6. The implications of these NPSs are considered in subsequent chapters of this Recommendation Report and under s104 in the recommendations to the SoS.

3.3. UK CLIMATE CHANGE ACT 2008 (as amended)

The Climate Change Act 2008 (as amended) establishes statutory climate change projections and carbon budgets. A 2019 revision to the Act sets a target of achieving 'net-zero' emissions by 2050. The target in the Act was substantively amended from 80% of baseline emissions by 2050 to 100% reduction (net zero) emissions by the Climate Change Act 2008 (2050 Target Amendment) Order 2019. The sixth carbon budget for the next period to 2035 was due to be published in December 2020.

3.4. MARINE AND COASTAL ACCESS ACT 2009

3.4.1. The Marine and Coastal Access Act 2009 (MCAA) introduced the production of marine plans and designation of Marine Conservation Zones (MCZs) in UK waters, as well as establishing the Marine Management Organisation (MMO). The primary aim of MCZs is to deliver the Government's vision for an 'ecologically coherent network of Marine Protected Areas (MPAs)' across the UK and to ensure the health of the wider UK marine environment.

3.4.2. The East Inshore Marine Plan applies to the landfall and offshore cable corridor from mean high water out to 12 nautical miles; the East Offshore Marine Plan applies to the remainder of the export cable corridor and offshore OWF infrastructure.

3.5. EUROPEAN LAW AND RELATED UK REGULATIONS

3.5.1. The United Kingdom left the European Union (EU) on 31 January 2020 and entered into a transition period which ended on 31 December 2020. The European Union (Withdrawal) Act (2018) as amended by the European Union (Withdrawal Agreement) Act (2020) provides that, subject to defined exceptions, European law which was extant up to exit day remains in force and was incorporated into UK law on exit day.

3.5.2. This Recommendation Report has been prepared on the basis of retained law and references in it to European terms such as 'habitats' have also

been retained for consistency with the Examination documents. It will be a matter for the SoS to satisfy themselves as to the position on retained law, obligations and equivalent terms at the point of their decision.

The EIA Directive

- 3.5.3. The EIA Directive (85/337/EEC) defines the procedure by which information about the environmental effects of a project is collected and considered by the relevant decision-making body before consent is granted for a development.
- 3.5.4. The Directive is transcribed into the law of England and Wales under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 2017 EIA Regulations), which came into force on 16 May 2017, which applies to the Proposed Development.

The Habitats Directive

- 3.5.5. The Habitats Directive (92/43/EEC) is the European nature conservation legislative measure which provides for a network of protected sites and a system of species protection.
- 3.5.6. Habitat types requiring the designation of Special Areas of Conservation (SACs) are listed in Annex I of the directive. Animal and plant species of interest whose conservation requires the designation of SACs are listed in Annex II. SACs form part of the Natura 2000 ecological network of protected sites. Annex IV lists animal and plants species of interest in need of legal protection. All species listed in these annexes are identified as European Protected Species (EPS).
- 3.5.7. The Habitats Directive is transcribed into the law of England and Wales under the Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations).

The Birds Directive

- 3.5.8. The Birds Directive (2009/147/EC) is the European nature conservation legislative measure for all wild bird species naturally occurring in the EU. It requires classification of areas as Special Protection Areas (SPAs) comprising all the most suitable territories for these species. All SPAs form part of the Natura 2000 ecological network.
- 3.5.9. The Birds Directive is also transcribed into the law of England and Wales under the Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations).

The Water Framework Directive

- 3.5.10. The Water Framework Directive 2000/60/EC (the WFD) sets objectives to prevent and reduce pollution, environmental protection, improve aquatic ecosystems and mitigate the effects of floods. It establishes a legislative framework for the protection of surface waters and groundwater and provides for the production of River Basin Management Plans for the sustainable management of water bodies.

- 3.5.11. The Directive is transcribed into the law of England and Wales under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

The Air Quality Directive

- 3.5.12. The Air Quality Directive 2008/50/EC (AQD) on ambient air quality and cleaner air for Europe sets limit values for compliance and establishes control actions where the limit values are exceeded for ambient air quality with respect to sulphur dioxide, nitrogen dioxide (NO₂) and mono-nitrogen oxides, particulate matter (PM₁₀ and PM_{2.5}), lead, benzene and carbon monoxide .
- 3.5.13. The 4th Air Quality Daughter Directive 2004/107/EC sets out similar provisions relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons limits in ambient air and may also be relevant.
- 3.5.14. Both Directive and Daughter Directive are transcribed into the law of England and Wales under the Air Quality Standards Regulations 2010.

The Renewable Energy Directive (2009)

- 3.5.15. The Renewable Energy Directive (2009/28/EC) and associated targets, primarily transposed into UK law through The Promotion of the Use of Energy from Renewable Sources Regulations 2011.

The revised Waste Framework Directive 2008

- 3.5.16. The revised Waste Framework Directive (2008/98/EC) (rWFD) is the primary European waste management directive applicable to this DCO application.
- 3.5.17. The Directive is transcribed into the law of England and Wales law under the Waste (England and Wales) Regulations 2011.

3.6. OTHER LEGAL PROVISIONS

Paris Agreement 2015

- 3.6.1. The 21st Conference of the Parties to the United Nations Framework Convention on Climate Change Paris Agreement was ratified in November 2016 in the UK. The agreement is a legal instrument that provides a framework for governments as well as business and investors to keep global warming well below 2°C, pursuing efforts to limit the temperature increase to 1.5°C.

United Nations Environment Programme Convention on Biological Diversity 1992

- 3.6.2. As required by Regulation 7 of the Infrastructure Planning (Decisions) Regulations 2010, the Panel has had regard to this Convention in its consideration of the likely impacts of the proposed development and appropriate objectives and mechanisms for mitigation and compensation.

- 3.6.3. The UK Government ratified the Convention in June 1994. Responsibility for the UK contribution to the Convention lies with the Department for Environment, Food and Rural Affairs which promotes the integration of biodiversity into policies, projects and programmes within Government and beyond.

The Wildlife and Countryside Act 1981

- 3.6.4. The Wildlife and Countryside Act 1981 (as amended) is the primary legislation which protects animals, plants, and certain habitats in England and Wales. It provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs) by NE. The Countryside and Rights of Way Act 2000 (as amended) (CRoW Act) brought in improved provisions for the protection and management of SSSIs and other designations under the Wildlife and Countryside Act 1981.

The Hedgerow Regulations 1997 (as amended by The Hedgerows (England) (Amendment) Regulations)

- 3.6.5. The Hedgerow Regulations 1997 (as amended by The Hedgerows (England) (Amendment) Regulations) set out the criteria for identifying 'important' hedgerows and are the main regulations used for protecting hedgerows.

Countryside and Rights of Way Act 2000 (as amended)

- 3.6.6. The CRoW Act 2000 (as amended) includes provisions in respect of public rights of way (PRoW) and access to land. It includes measures to protect Areas of Outstanding Natural Beauty (AONBs) and duties for boards set up to manage AONBs.
- 3.6.7. S85(1) of the Act provides a duty for all public bodies including ExAs and the SoS to have regard to the purpose of AONBs. In exercising or performing any functions in relation to, or so as to affect, land in an AONB, a relevant authority shall have regard to the purpose of conserving and enhancing the natural beauty of the area of outstanding natural beauty.

Natural Environment and Rural Communities Act 2006

- 3.6.8. The Natural Environment and Rural Communities Act 2006 (as amended) makes provision for bodies concerned with the natural environment and rural communities, in connection with wildlife sites, SSSIs, National Parks and the Broads.
- 3.6.9. S40(1) includes a duty that every public body (including the ExA and SoS) must, in exercising its functions, have regard so far as is consistent with the proper exercising of those functions, to the purpose of conserving biodiversity. In complying with this duty, s40(2) provides that regard must be had to the United Nations Environment Programme Convention on Biological Diversity 1992.

The Energy Act 2004 (as amended)

- 3.6.10. The Energy Act 2004 (as amended) establishes a regulatory regime for Offshore Renewable Energy Installations (OREIs) in the UK's Exclusive Economic Zone beyond the Territorial Sea and supplements the regime which already applies in the UK's Territorial Waters.

The International Convention for the Safety Of Life At Sea (SOLAS) 1974 (as amended)

- 3.6.11. The International Convention for the Safety Of Life At Sea (SOLAS) (1974) (as amended) is an international maritime treaty which sets minimum safety standards in the construction, equipment and operation of merchant ships, implemented under UK legislation by The Merchant Shipping (Safety of Navigation) Regulations 2002.

International Regulations for Preventing Collisions at Sea 1972 (as amended)

- 3.6.12. International Regulations for Preventing Collisions at Sea (COLREGs) (1972) (as amended) are regulations published by the International Maritime Organisation (IMO) under the Convention on the International Regulations for Preventing Collisions at Sea. They are in effect the 'Highway Code' of the sea, setting out navigation rules to be followed by ships and other vessels at sea to prevent collisions between two or more vessels.

The Air Navigation Order 2016

- 3.6.13. The Air Navigation Order 2016 covers the application of aviation obstruction lighting to wind turbines in UK territorial waters.

The Protection of Wrecks Act 1973

- 3.6.14. The Protection of Wrecks Act 1973 provides protection for sites of wrecks designated for historical, archaeological or artistic value including provision for a restricted area around the wreck site.

The Protection of Military Remains Act 1986

- 3.6.15. The Protection of Military Remains Act 1986 provides protection for the wreckage of military aircraft and designated military vessels. The Act provides for two types of protection: 'protected places' and 'controlled sites'. Under the Act it is an offence to disturb a 'protected place', or to remove anything from the site; and it is illegal to conduct any operations within a 'controlled site' that might disturb the remains unless licensed to do so by the Ministry of Defence.

The Ancient Monuments and Archaeological Areas Act 1979

- 3.6.16. The Ancient Monuments and Archaeological Areas Act 1979 (as amended by the National Heritage Acts 1983 and 2002) (Section 61 (7)) protects scheduled monuments including: "*... any site comprising or comprising the remains of any vehicle, vessel or aircraft or other movable structure or part thereof...*". This applies to certain designated wrecks and any works taking place within such a site require Scheduled Monument Consent from the SoS.

3.7. MADE DEVELOPMENT CONSENT ORDERS

3.7.1. In the Explanatory Memorandum [REP10-007] submitted at Deadline 10, the Applicant outlined the made Development Consent Orders (DCO) for which they have had regard to, these are:

- The East Anglia ONE Offshore Wind Farm Order 2014;
- The East Anglia THREE Offshore Wind Farm Order 2017;
- The Eggborough Gas Fired Generating Station Order 2018;
- The Highways England M20 Junction 10a Order 2017;
- The Hinkley Point C (Nuclear Generating Station) Order 2013;
- The Hornsea One Offshore Wind Farm Order 2014;
- The Hornsea Two Offshore Wind Farm Order 2016;
- The Knottingley Power Plant Order 2015;
- The Millbrook Gas Fired Generating Station Order 2019;
- The National Grid (Hinkley Point C Connection Project) Order 2016;
- The National Grid (North London Reinforcement Project) Order 2014;
- The National Grid (Richborough Connection Project) Order 2017;
- The Norfolk Vanguard Offshore Windfarm Order 2020;
- The Northampton Gateway Rail Freight Interchange Order 2019;
- The Silvertown Tunnel Order 2018;
- The Tees Combined Cycle Power Plant Order 2019;
- The Triton Knoll Electrical System Order 2016; and
- The Wrexham Gas Fired Generating Station Order 2017.

3.8. TRANSBOUNDARY EFFECTS

3.8.1. Where development has the potential to give rise to significant effects on the environment in other EEA States, Regulation 32 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regs) applies. Regulation 32 sets out the obligations on the SoS to notify and consult other EEA State(s), which need to be considered alongside the statutory timeframes as prescribed by the PA2008.

3.8.2. The transboundary effects for this Proposed Development are discussed in Section 5.24 of this report.

3.9. OTHER RELEVANT POLICY STATEMENTS

The National Planning Policy Framework

3.9.1. The National Planning Policy Framework (NPPF) was originally published in March 2012 with the latest revision published in February 2019 and sets out the Government's planning policies for England and how these are expected to be applied. Paragraph 5 of the NPPF states that it does not contain specific policies for NSIPs for which particular considerations apply. It explains that NSIP projects are determined in accordance with the decision-making framework set out in PA2008, and relevant NPSs for major infrastructure, as well as any other matters considered both important and relevant (which may include the NPPF).

Development Plans

3.9.2. The onshore elements of the Proposed Development are in the County of Norfolk. Norfolk County Council is the upper tier council for the county producing the Core Strategy and Minerals and Waste Development Management Policies 2010-2026.

3.9.3. The onshore elements of the Proposed Development also run through three district councils; their Development Plan documents relevant to the Proposed Development are listed below:

Breckland District Council

3.9.4. Breckland District Council Local Plan [adopted November 2019].

Broadland District Council

3.9.5. Joint Core Strategy (with Norwich and South Norfolk) [adopted March 2011, amended January 2014]; and

3.9.6. Development Management Development Plan Document [adopted August 2015]

North Norfolk District Council

3.9.7. Core Strategy & Development Management Policies [September 2008].

3.9.8. As stated in paragraph 4.1.5 of EN-1, if there is any conflict between the above documents and an NPS then the NPS takes precedence due to the national significance of the infrastructure.

3.10. THE SECRETARY OF STATE'S POWERS TO MAKE A DCO

3.10.1. The ExA did not receive any formal requests for a material or non-material change during the Examination. Whilst information has been forthcoming during the Examination in relation to many detailed matters from many different parties as a result of questions and discussions, the ExA does not consider these have materially changed the application such that it is a different application. Therefore, the ExA consider that the SoS is able to make the recommended DCO within the powers of s114.

3.11. CONCLUSIONS

3.11.1. This Chapter has considered relevant policies and legislation which were taken into account by the ExA in carrying out its Examination.

4. PROJECT-WIDE MATTERS

4.1. INTRODUCTION

- 4.1.1. This Chapter reports on overarching project-wide matters. It identifies the principal issues informed the Examination, sets out relevant offshore wind planning history, considers the need case underpinning the application and the framework within which the EIA was undertaken, including the Applicant's approach to the consideration of alternatives and assessment of cumulative effects.

4.2. PRINCIPAL ISSUES

- 4.2.1. The Examining Authority's (ExA's) Initial Assessment of Principal Issues (IAPI) for the Examination, as required under s88 of the Planning Act 2008 (as amended) (PA2008) and Rule 5 of The Infrastructure Planning (Examination Procedure) Rules 2010, was made prior to the Preliminary Meeting held on 12 November 2019 [EV1-002], [EV1-003].
- 4.2.2. In making its IAPI the ExA had regard to the application documents, relevant National Policy Statements (NPSs) and the relevant guidance from the former Department for Communities and Local Government together with Relevant Representations (RRs) submitted by Interested Parties (IPs) [RR-001] to [RR-113].
- 4.2.3. Principal Issues were identified as follows [PD-006, Annex B]:
- a. Biodiversity, Biological Environment and Ecology;
 - b. Compulsory Acquisition;
 - c. Cumulative Effects of Other Proposals;
 - d. Fishing;
 - e. Grid Connection;
 - f. Habitats Regulations Assessment (HRA);
 - g. Landscape and Visual Effects;
 - h. Marine and Coastal Processes;
 - i. Navigation and Shipping;
 - j. Onshore Construction Effects;
 - k. Socio-economic Effects;
 - l. Traffic and Transportation; and
 - m. Water Resources (to include flood, drainage and irrigation matters).
- 4.2.4. A number of parties made written submissions in response to the Rule 6 letter containing the IAPI. At the Preliminary Meeting, the ExA also heard representations about the principal issues. The ExA explained that principal issues were broadly defined and that the list was not intended to be exhaustive or definitive. Nor would the initial assessment of principal issues constrain the examination of other important and relevant matters [EV1-002].
- 4.2.5. Matters raised in response to the Rule 6 letter included cumulative effects in relation to other OWFs, involving onshore effects of extensions to Dudgeon and Sheringham Shoal offshore windfarms (OWF) [AS-038],

[EV1-003] and the way in which the Secretary of State for Business Energy and Industrial Strategy (SoS) decision on the Norfolk Vanguard OWF would affect the Examination. Other matters raised were alternatives regarding the electrical transmission technology and grid connection [AS-032] [EV1-003] and consideration to be given to public health and wellbeing [AS-032].

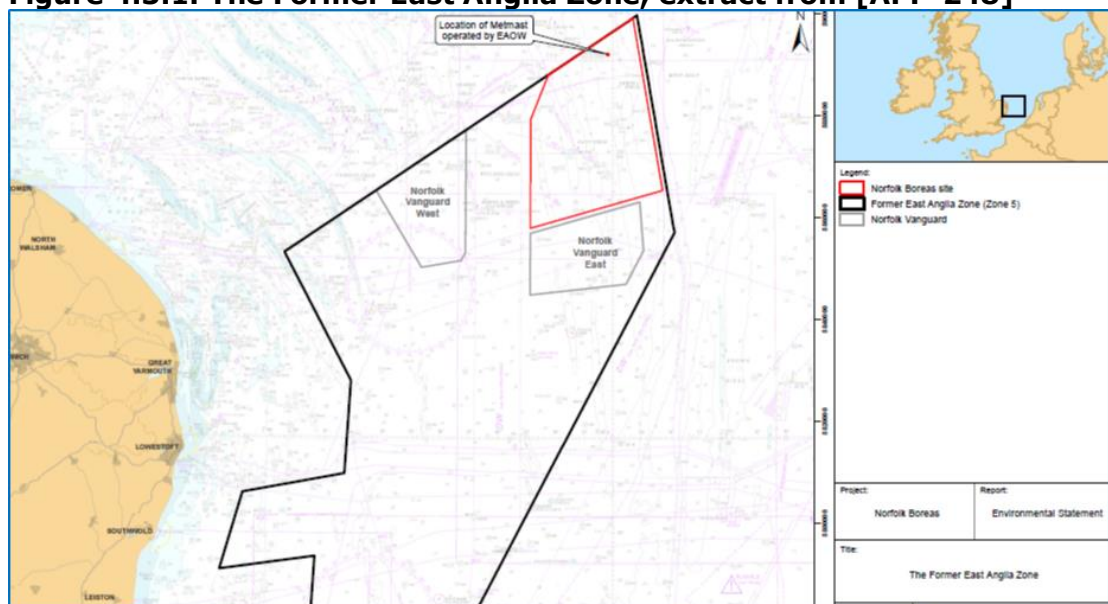
- 4.2.6. These matters were considered and examined by the ExA. This Recommendation Report is structured to take account of the IAPI, representations made at and during the Preliminary Meeting, relevant policy and the subsequent consideration of matters during the Examination.

4.3. RELEVANT PLANNING HISTORY

Offshore wind tender process

- 4.3.1. The UK Offshore Wind Round 3 tender process in December 2009 by The Crown Estate created the East Anglia Zone/ Zone 5 for development. East Anglia Offshore Wind Ltd., consisting of a joint venture between Vattenfall Wind Power Limited (VWPL) and Scottish Power Renewables (UK) Limited (SPR), was granted the rights to develop this zone through a Zone Development Agreement (ZDA).
- 4.3.2. The zone was split into two in December 2014 with VWPL and SPR developing the new north and south areas respectively. The ZDA was dissolved in 2016 by The Crown Estate and Agreements for Lease were signed with the two parties independently to develop new OWFs. VWPL signed Agreements for Lease for Norfolk Boreas and Norfolk Vanguard. Figure 4.4.1 below shows the location of the different offshore elements.

Figure 4.3.1: The Former East Anglia Zone, extract from [APP-248]



Norfolk Vanguard OWF and Hornsea Project Three OWF

- 4.3.3. Decisions of the SoS on whether to grant development consent for the Hornsea Project Three OWF and the Norfolk Vanguard OWF were anticipated to take place at or around the end of 2019. This was a relevant and important matter for the ExA, given the potential cumulative, inter-related and in-combination effects between these two OWF projects with the Proposed Development, both offshore and onshore. These matters are reported further below in Section 4.5 and in Chapters 5 and 6.
- 4.3.4. Decisions on whether to grant development consent, were delayed by the SoS. The SoS subsequently consented the Norfolk Vanguard OWF on 1 July 2020. Government announced at the same time that it was 'minded to approve' the Hornsea Project Three OWF and would confirm the position by 31 December 2020, following requests for additional information and consultation on certain topics.
- 4.3.5. The ExA has kept abreast of these events. It has regularly invited representations from the Applicant and IPs on possible implications for the Proposed Development and has considered these fully.
- 4.3.6. A claim for judicial review was issued on 13 August 2020 seeking to quash the Norfolk Vanguard DCO, challenging whether the approach taken by the SoS to consideration of cumulative effects with the proposed Norfolk Boreas OWF was lawful. The High Court granted permission for a challenge to the Government decision to grant development consent for the Norfolk Vanguard OWF. At the time this Examination closed, no date was set for the judicial review. The Applicant argued that the mere making of the claim is of no relevance to the ExA in making its recommendation to the SoS [REP14-036, Q5.16.0.5], [REP18-026, point 1.1]. The ExA has prepared this report on the basis of the known information available to us at the close of the examination. It will be a matter for the SoS to consider any change to that position at the time of their decision. The impacts between the two schemes are discussed in the later sections of this report and in the review of cumulative impacts in Chapter 5.

4.4. NEED FOR DEVELOPMENT

- 4.4.1. The need for new energy nationally significant infrastructure projects (NSIPs) is set out in the Overarching National Policy Statement for Energy (NPS EN-1), which sets out policy requirements for:
 - a. all types of energy infrastructure (Section 3.1);
 - b. Electricity generation (Section 3.3); and
 - c. sourcing energy from renewables (Section 3.4).
- 4.4.2. Section 3.1 has established that there is a need for all the types of energy infrastructure in order to achieve energy security and also for dramatically reducing greenhouse gas emissions. It follows that the Secretary of State (SoS) must assess all applications for development

consent for the types of infrastructure covered by the energy NPSs on the basis that the Government has demonstrated that there is a need for those types of infrastructure and give substantial weight to the contribution the projects would make towards satisfying this need.

- 4.4.3. Section 3.3 establishes that the Government believes there is an urgent need for new electricity NSIPs to meet the forecast increase in demand for electricity for domestic and industrial heating and transport, to maintain a resilient system that can deal with unexpected events, lower the risk of a supply interruption and avoid rising and volatile prices. Given that energy NSIPs take a long time to move from design conception to operation, there is an urgent need for new (and particularly low carbon) energy NSIPs to be brought forward as soon as possible. As a consequence of this urgent need, there is a presumption in favour of granting consent for energy NSIPs unless other policies in the NPS indicate that permission should be refused (NPS EN-1, para 4.1.2).
- 4.4.4. NPS EN-1 sets out the 'direction of travel' for meeting Government objectives on carbon emission reductions, energy security and affordability (NPS EN-1, Part 2). The need is also driven by International, European and National legislation summarised in Chapter 3 of this Recommendation Report. The Government believes that a diverse mix of all types of power generation helps to ensure security of supply. In this regard, renewables such as offshore wind offer a low carbon and proven fuel source, even if these technologies may provide intermittent generation.
- 4.4.5. Section 3.4 of NPS EN-1 establishes the Government's commitment to sourcing energy from renewable sources to tackle climate change, reducing the UK's emissions of carbon dioxide. To this end, offshore wind is expected to provide the largest single contribution towards the renewable energy generation targets.

The Applicant's case and issues raised

- 4.4.6. The ExA notes the evidence of need set out by the Applicant in its Need Statement [APP-215], Planning Statement [APP-693, Section 1.3], ES Policy and Legislative Context [APP-216, Section 3.3], Statement of Reasons [REP5-006, Section 5], its Position Statement on Derogation [REP6-025] and the In Principle HRA Derogation Evidence [REP7-024].
- 4.4.7. The Applicant's Statement of Reasons states that the Proposed Development would:
- directly respond to the urgent need to decarbonise the UK energy supply and enhance the UK's energy security and diversity of supply as identified in the NPSs; and
 - make a significant contribution towards the achievement of the Government's renewable energy targets [REP5-006, para 5.15].
- 4.4.8. The Applicant's Position Statement on Derogation states that if the UK is to meet its aim to reach 40GW of offshore wind by 2030, and the 2050 net zero commitment, the Proposed Development as well as other OWFs

would be necessary [REP6-025, para 10]. The Applicant states that the Proposed Development would provide up to 1,800MW of renewable energy, securing supply for nearly 2 million UK households, being more than 2% of the UK's annual energy demand, or 25% of the East of England's electricity demand (domestic, commercial and industrial). It would also reduce carbon emissions and contribute to the economy by providing jobs [APP-215, para 48, 49].

- 4.4.9. In the Derogation evidence, the Applicant set out the key drivers underpinning the urgent need for renewable energy, which are; the need for energy security and the need to reduce greenhouse gas emissions by increasing energy production from renewable sources [REP7-024, Section 4.3].
- 4.4.10. During the Examination, the ExA only received one representation questioning the need for the Proposed Development which was from Mulbarton Parish Council (Mulbarton PC)¹. Mulbarton PC set out reasons it considered demonstrate that there is no great urgency to introduce additional wind capacity off the East Coast of England at this time [REP16-023].
- 4.4.11. In response the Applicant referred to a number of legal and policy arguments to refute Mulbarton PC's case. These included: the Government's commitment to reduce emissions by at least 100% of 1990 levels by 2050 through legally binding carbon budgets (creating urgency because the UK is not on track to meet carbon budgets), the October 2020 Prime Ministerial public announcement regarding plans to power all UK homes using renewable energy from OWFs by 2030, and local plans and policies which recognise the significance of the offshore wind sector.
- 4.4.12. At WQ5, the ExA invited any further points from the Applicant on the need for the Proposed Development which it considered would be important and relevant to the case for the SoS decision because of the time which had elapsed since the application was submitted [PD-022, Q5.16.0.3]. The Applicant responded that the evidence base supporting offshore wind and the Proposed Development as an efficient and cost-effective solution to reduce the impacts of climate change, energy shortfall and unemployment had increased significantly at a global, national and regional level since the application was made in June 2019. The Applicant referred to that evidence contained in its Deadline 7 (D7) derogation case and evidence provided since the D7 submission [REP14-036, Q5.16.0.3].
- 4.4.13. The evidence was set out in detail and includes:
- a. new evidence of the harmful effects of human-accelerated climate change and positive effects of deploying non-greenhouse gas-emitting technologies;

¹ Mulbarton is a parish south of Norwich in the vicinity of the proposed substation location for the Hornsea Project Three OWF at Swardeston.

- b. declaration of a climate emergency in the UK government in May 2019 and amendments to the Climate Change Act 2008 (2050 Target Amendment) 2019;
- c. Government's statutory body's Progress Report on reducing emissions for 2019 (CCC, 2019) which found that actions outlined in CCC, 2018 were significantly behind where they should be, and that rapid progress would be required to meet Government's targets;
- d. The Crown Estate's Round 4, 2019 Information Memorandum showed only a very small level of contingency in capacity to meet the 2030 30GW target (Round 3 was expected to provide 32GW, yet in 2020 the capacity of operational OWFs plus the last Round 3 OWFs currently in planning, would total approximately 10GW); and
- e. the current Government's response to include in its manifesto, a target to deliver 40GW of installed offshore wind generating capacity by 2030 – increasing the target by 10GW.

4.4.14. The Applicant argued that these factors illustrate the political will for offshore wind to be the backbone of the clean, reliable, affordable energy system that would power an economy with net zero carbon emissions. Also, that consenting the Proposed Development (which it states would be one of the biggest OWFs in the world [APP-215, para 46]) would make a significant contribution to all of those needs. The Applicant set out other recent factors which it argued support the need from a socio-economic point of view:

- a. the UK economy has now shrunk by up to 25% due to the Covid-19 Pandemic with out-of-work benefit claims at the highest they have been for 12 years;
- b. the commitment to green energy and in particular offshore wind offers a significant boost to the UK economy;
- c. the offshore wind industry is the fourth largest investor in UK infrastructure and would lead to the creation of a significant number of jobs (up to 27,000 direct UK jobs by 2030);
- d. it is estimated that, by 2030, offshore wind could increase GDP by 0.6% and support 173,000 jobs;
- e. green energy such as offshore wind could drive the Covid-19 recovery;
- f. offshore wind is revitalising coastal counties and communities across the UK, with emerging "*offshore wind clusters*" of business, innovation and higher education institutions; and
- g. there is an appetite and huge potential for an East of England Cluster - this ambition is set out in various local policies and plans, including the New Anglia LEP's Local Industrial Strategy (New Anglia 2020) and in the region's Covid-19 Economic Recovery Restart Plan [REP14-036, Q5.16.0.3].

ExA's reasoning on need

4.4.15. The ExA is satisfied that the need case is robust and has been made by the Applicant in accordance with the NPS framework. The case has been made that the Proposed Development would make a significant contribution to an increased supply from renewables, contribute to

meeting energy security and carbon reduction targets and contribute towards future increases in electricity demand identified in NPS EN-1. Additionally, the Applicant has presented further socio-economic evidence which it argues supports the case for development.

- 4.4.16. Therefore, in terms of broad matters of principle, the ExA is satisfied that the need for the Proposed Development has been established. As required by NPS EN-1, the ExA recommends that the SoS should give substantial weight to the contribution that the Proposed Development would make to satisfying the need for this type of energy infrastructure (NPS EN-1, Para 3.1.4). The presumption in favour of development for offshore wind, as an energy type set out in NPS EN-1, would therefore be engaged (NPS EN-1, para 4.1.2).

4.5. ENVIRONMENTAL STATEMENT AND ENVIRONMENTAL IMPACT ASSESSMENT

Introduction

- 4.5.1. Section 2.4 of this Recommendation Report confirms the Proposed Development is development for which an environmental impact assessment (EIA) is required and reports the notifications the Applicant undertook. This section covers project-wide aspects of the EIA including alternatives, signposting where this is covered, cumulative effects in terms of policy and projects for inclusion, and also concludes on the adequacy of the Environmental Statement (ES).

Consideration of alternatives for Environmental Impact Assessment purposes

- 4.5.2. The Applicant's ES includes information about the main alternatives considered. This is contained in the ES Chapter 4, Site Selection and Assessment of Alternatives [APP-217], which is supported by a set of Figures [APP-248] to [APP-264] and Appendices [APP-537] to [APP-546]. The main reasons for the Applicant's choices are set out in these documents and summarised elsewhere such as in the Design and Access Statement (DAS) [REP14-014].
- 4.5.3. NPS EN-1 makes it clear that there is no requirement to consider alternatives or establish whether the Proposed Development would represent the best option (NPS EN-1, para 4.4.1). However, as required under the EIA Directive and relevant regulations, the Applicant is obliged to include information regarding the main alternatives studied in its ES (NPS EN-1, para 4.4.2). Other statutory or policy factors that require alternatives to be considered include the legislative requirements under the Habitats Regulations and the policy requirement to consider alternatives in relation to biodiversity, flood risk and landscape and visual impacts (NPS EN-1, para 4.4.4).
- 4.5.4. Reporting of alternatives in this Recommendation Report is covered in several Chapters/ Sections as follows:

- a. Section 5.2 on Traffic and Transport covers the potential to use a haul route which could reduce or avoid HGV traffic through the village of Cawston;
- b. Section 5.3 on Landscape and Visual Effects sets out the policy position and covers the onshore location and technology alternatives considered;
- c. Section 5.7 on Water Resources and Flood Risk regarding the Sequential Test for flood risk assessment;
- d. Section 5.15 on Grid Connection covers matters relating to the National Grid connection including representations on potential for an integrated offshore transmission network (commonly referred to as an Offshore Ring Main (ORM));
- e. Chapter 6 on HRA deals with feasible alternatives considered under HRA, some of which are also cross referenced in Section 5.6 Terrestrial Biodiversity, Biological Environment and Ecology and 5.9 Marine Biodiversity, Biological Environment and Ecology; and
- f. Chapter 8 on Compulsory Acquisition confirms that alternatives to the exercise of powers of compulsory acquisition have been considered by the Applicant.

Cumulative effects as considered in the ES

- 4.5.5. Cumulative effects with other proposals and developments were identified as a principal issue [PD-006]. Cumulative effects which relate to the topic areas considered in Chapter 5 of this Recommendation Report are reported in the relevant sections of Chapter 5. The policy background for cumulative effects and the content of the Applicant's CIA is set out here, together with reporting on the question of projects for inclusion in the Cumulative Impact Assessment (CIA), over which there were differences of opinion.

Policy considerations

- 4.5.6. NPS EN-1 sets out that the European Environmental Impact Assessment Directive requires that an applicant's assessment of the likely significant effects of the proposed development on the environment should cover cumulative effects (NPS EN-1, para 4.2.1). NPS-EN-3 refers to NPS EN-1 for the general principles for assessment and refers to the need for cumulative assessment as set out in NPS EN-1, Section 4.2.
- 4.5.7. NPS EN-1 requires an applicant to assess how the effects of the proposed development would combine and interact with the effects of other development including projects for which consent has been sought or granted, as well as those already in existence (NPS EN-1, para 4.2.5).
- 4.5.8. To reach a decision, NPS EN-1 requires the SoS to:
- a. consider accumulation of effects as a whole in decision-making on individual applications (NPS EN-1, para 1.7.3);
 - b. take account of cumulative effects when weighing the adverse effects (NPS EN-1, para 4.1.3);
 - c. consider other evidence which may be before it on cumulative effects and interactions (NPS EN-1, para 4.2.5); and

- d. consider how the accumulation of and interrelationship between effects might affect the environment, economy or community as a whole – even though effects might be acceptable on an individual basis (NPS EN-1, para 4.2.6).

4.5.9. The National Planning Policy Framework (NPPF) sets out that plans for renewable and low carbon energy and heat should ensure adverse effects, including cumulative landscape and visual effects, are addressed satisfactorily (para 151).

The application

4.5.10. The application's ES covers CIA on a topic-by-topic basis in the relevant ES technical chapters. Cumulative matters are drawn together in two ES chapters, Chapter 32 for offshore [APP-245] and Chapter 33 for onshore [APP-246]. Both chapters are supported by appendices which list the projects considered in the respective CIAs [APP-684], [APP-685].

4.5.11. The basis on which the relevant topics and projects have been identified for inclusion in the CIA is set out in assessment methodology sections in the two chapters. A long list of projects with the potential to interact was prepared. The inclusion of a project is based on those which are considered to be reasonably well described and sufficiently advanced to provide information on which to base a meaningful and robust assessment. Reference is made to the Planning Inspectorate Advice Notes² on this matter [APP-245, Section 32.4], [APP-246, Section 33.4].

4.5.12. The Applicant indicated it was mindful of extensions to many Round 3 OWF sites and that preparation for Round 4 sites was underway. These projects were considered for CIA only in those ES chapters where it was considered that Scoping Reports contained sufficient detail to undertake a meaningful assessment [APP-245, Section 32.4.1].

4.5.13. As referred to in Chapter 1, the Applicant's assessment of the effects of the Proposed Development considers two scenarios [APP-218]:

- Scenario 1 – Norfolk Vanguard OWF would proceed to construction and install ducts and other shared enabling works for the Proposed Development; and
- Scenario 2 - Norfolk Vanguard OWF does not proceed to construction and the Proposed Development would proceed alone. The Proposed Development would undertake all works required as an independent project.

4.5.14. While some effects would be the same for both scenarios, others would be different for each scenario. In so far as construction effects are concerned, the Applicant states that in general Scenario 1 is considered the worst case for offshore and Scenario 2 the worst case for onshore construction effects [APP-219, para 20, 21]. During operation in general

² Planning Inspectorate Advice Note Nine: Rochdale Envelope and Advice Note Seventeen: Cumulative effects assessment

Scenario 1 would represent the worst case primarily due to the location of the onshore substations.

4.5.15. Norfolk Vanguard OWF is therefore included in Scenario 1 assessments. It is also included in the Applicant's onshore CIA. This is because Scenario 1 assumes that the Norfolk Vanguard OWF would have undertaken some of the enabling works required for the Proposed Development, but not all; and because the two projects would have different construction periods.

4.5.16. The Applicant explained that separate offshore CIAs for Scenarios 1 and 2 were not necessary because the worst case for all offshore cumulative effects would be Scenario 1 (the Proposed Development and Norfolk Vanguard OWF), and that is what has been assessed [REP14-036, Q5.4.0.2].

4.5.17. The ExA agrees with the Applicant's analysis regarding which scenario represents the worst case during construction and during operation.

Projects for inclusion in the CIA

4.5.18. In WQ1, the ExA asked the Applicant and IPs to comment on projects included in the CIA. The ExA specifically asked for views on the inclusion or otherwise of the Dudgeon and Sheringham Shoal extension projects because they had been submitted to the Planning Inspectorate for a scoping opinion. The Applicant set out the process adopted and justified its cut-off date of 20 March 2019 for projects needing to be sufficiently advanced for inclusion in the CIA [REP2-021, Q4.0.1].

4.5.19. Necton Substation Action Group (NSAG)³ commented that the existing Dudgeon substation should be considered cumulatively along with Norfolk Vanguard OWF's substation extension and the Proposed Development [REP17-011, point 1]. The ExA is content that the Dudgeon substation (and the Necton National Grid substation) are included in the Applicant's landscape and visual impact assessment (LVIA) baseline and therefore have been considered under Scenario 1.

4.5.20. In terms of the proposed Dudgeon and Sheringham Shoal extensions, the Applicant argued that their inclusion in the CIA for the Proposed Development was not appropriate because the projects lacked sufficiently developed information. The matter of the inclusion of the Dudgeon and Sheringham Shoal extensions arose again at OFH3 (Oulton and Cawston sessions) [EV13-010], [EV13-012]. Following the ExA's questions at ISH5, the Applicant explained that its position remained unchanged. Its earlier response was still an accurate reflection because the level of detail in the public domain on which it could carry out CIA had not changed since October 2019. This level of detail remained insufficient. The Applicant also drew attention to the fact that in due course, any CIAs for Dudgeon and Sheringham Shoal extensions would also need to include

³ NSAG is a local action group in with a membership of 250, set up initially to respond to the Dudgeon substation proposals [EV13-011].

potential cumulative impacts arising with those from the Proposed Development [EV14-004], [REP13-016, Item 8c].

- 4.5.21. The ExA appreciates that the concerns raised by IPs such as Oulton and Cawston Parish Councils and the Broadland County and District Councillor regarding the future cumulative onshore effects for the area are not allayed by this response. This is reported further in Section 5.22 of this Recommendation Report when considering inter-related effects (where effects arising from different topics could have a combined effect on a receptor). However, in terms of the inclusion of the Dudgeon and Sheringham Shoal extensions in the CIA for the Proposed Development, the ExA is content that the Applicant has adopted the correct approach, followed the appropriate guidance⁴ by not including them in its CIA; and that the Applicant did not need to update its CIA.

Adequacy of the ES

- 4.5.22. NPS EN-1, Section 4.2 sets out the considerations for determining the adequacy of the ES accompanying an application for development consent (in this case including a number of deemed marine licences). On submission, all the application documents were reviewed within the statutory period available for Acceptance. The information within the ES was considered to be of an adequate standard for examination.
- 4.5.23. At the end of the Examination there remain some matters still under discussion and some matters not agreed which related to EIA existing environment, EIA assessment methodology, EIA assessment findings and cumulative impact assessment. The status of each topic area with each party in SoCGs is set out in the Applicant's Statement of Commonality of Statements of Common Ground [REP18-030]. These are all reported under the relevant topic sections of Chapter 5 of this Recommendation Report and in Chapter 6 for HRA matters.
- 4.5.24. Overall, in the light of the submitted documentation and the submissions received, the ExA considers that the ES, as supplemented with the additional information secured during the Examination, provides an adequate basis for the EIA. In turn the ExA also considers that the various elements of the EIA, supplemented by the information received during the Examination, now form an adequate basis for this Recommendation Report and for decision making by the SoS.

4.6. CONCLUSION

- 4.6.1. This Chapter set out the way in which the principal issues informed consideration of project-wide matters and specific topics during the Examination. It also provided a background to relevant offshore wind planning history. In addressing other project-wide matters, the ExA's consideration of the case on need concludes that the Applicant's case underpinning the need is robust. The ExA also finds that the ES forms an adequate basis for EIA. Having set out the response to project-wide

⁴ Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment

matters in broad terms here, detail arising from them is considered in Chapters 5, 6 and 8.

5. FINDINGS AND CONCLUSIONS IN RELATION TO THE PLANNING ISSUES

5.1. INTRODUCTION

- 5.1.1. This Chapter considers the main issues in the Examination. The process by which these were determined is summarised at the beginning of Chapter 4 of this Recommendation Report.
- 5.1.2. There is no significance to the order in which topics are discussed, although onshore matters have generally been considered first. Each topic includes conclusions in relation to the NPS policy framework and other policy as appropriate.
- 5.1.3. The topics appear in the following order:
- Onshore Matters;
 - Offshore Matters;
 - Other Matters; and
 - Cumulative Effects.
- 5.1.4. In considering the matters raised by the application, the Examining Authority (ExA) has taken note of the approach adopted by the Applicant to its assessment of the effects of the Proposed Development in the Environmental Statement (ES).
- 5.1.5. The Applicant's assessment considers two scenarios [APP-218]:
- Scenario 1 – The Norfolk Vanguard Offshore Windfarm (OWF) would proceed to construction and would install ducts and other shared enabling works for the Proposed Development as described in Chapter 1 of this Recommendation Report; and
 - Scenario 2 – The Norfolk Vanguard OWF does not proceed to construction and the Proposed Development would proceed alone. The Proposed Development would undertake all works required to connect it to the national electricity transmission grid as an independent project.
- 5.1.6. While some effects are the same for both scenarios, others are different for each scenario. The ExA has considered the effects which would arise from both scenarios. It is the Applicant's view that in general Scenario 2 is considered the worst case scenario for onshore effects and Scenario 1 is the worst case for offshore. These effects are assessed in the relevant chapters of the ES. Where there are differences to this assumption, these are identified in the relevant section of Chapter 5 of this Recommendation Report and reported under each issue considered.
- Mitigation**
- 5.1.7. The ExA also considers it helpful to summarise the types of mitigation proposed by the Applicant in the Environmental Impact Assessment (EIA), as this provides the backdrop to topics discussed in the following sections of this chapter.

- 5.1.8. For the purposes of the EIA, the following types of mitigation have been proposed:
- a. Embedded mitigation is common across the Proposed Development and consists of measures that are identified and adopted as part of the evolution of the project design, and are included and assessed in the EIA; and
 - b. Additional mitigation is proposed to address specific adverse effects identified during the EIA process in each technical area, and typically consists of measures that are: embedded mitigation specific for that topic area, standard mitigation, enhanced mitigation and so on. Additional mitigation is therefore topic-specific [APP-219, Section 6.5.5.2], and reported as relevant to each section of this Recommendation Report.
- 5.1.9. Onshore the embedded mitigation is divided into "*embedded project mitigation*" and other more topic-specific types of mitigation. Embedded project mitigation is common across the onshore aspects of the Proposed Development and is set out in each of the onshore technical chapters of the ES in a table titled "*Embedded project mitigation*". It is précised below and is not repeated in other sections of this Chapter 5.
- 5.1.10. Onshore it consists of:
- commitment to High Voltage Direct Current (HVDC) technology as the export system to minimise environmental effects, such as: reducing the overall footprint of the onshore cable route, reducing the duration of the cable pulling phase, and removing the requirement for a cable relay station as permanent above ground infrastructure;
 - site selection based on considerations incorporating environmental considerations in collaboration with the engineering design requirements, such as: proximity to the existing Necton National Grid substation and associated infrastructure and a preference for the shortest route length;
 - long Horizontal Directional Drilling (HDD) at landfall to avoid impacts, restrictions or closures to Happisburgh foreshore and intertidal zone during construction;
 - the strategic approach to delivery for Scenario 1 proposes that onshore ducts would be installed for both the Proposed Development and the Norfolk Vanguard OWF project at the same time, allowing the main civil works for the cable route to be completed in one construction period;
 - duct installation strategy under Scenario 2, proposes that construction teams would work on a short section of approximately 150m length to minimise the amount of land being worked on at any one time, and would also minimise the duration of works on any given section of the route; and
 - trenchless Crossings to minimise effects at certain sensitive locations, including Wildlife Sites, Public Rights of Way (PRoW), Coastal Paths, Trunk Roads, railway lines, and major watercourse crossings.
- 5.1.11. Offshore, the "*embedded project mitigation*" is not identified in the same way as onshore. From reviewing the offshore chapters of the ES, the ExA

has identified the following as mitigation which was embedded during early stages of the Proposed Development's design development:

- site selection of the site and offshore cable corridor to avoid as far as possible designated sites and to use appropriate cable installation methods to minimise effects where designated sites or cable crossings cannot be avoided;
- use of long HDD from an offshore location to the subtidal zone to avoid the intertidal zone;
- reduction of the maximum number of wind turbines and removal of floating foundations to minimise disturbance and habitat loss;
- pile-driving would be used in preference to drilling where ground conditions allow to minimise the quantity of sub-surface sediment released into the water column from the installation process;
- a soft start and ramp-up protocol would be used for pile driving to enable mobile species to move away from areas of highest noise impact during installation of foundations;
- scour protection material would be installed where required during construction to mitigate the effects of scour and the associated release of suspended sediment and bed level changes;
- use of an HVDC solution to reduce the number of export cables; use of pre-construction surveys to inform the location of wind turbines and the routing of all cables, including micro-siting around sensitive feature where possible;
- minimising cable protection and the effects of electromagnetic fields by burying offshore export cables where possible; all seabed material arising from the Haisborough, Hammond and Winterton Special Area of Conservation (HHW SAC) during cable installation would be placed back within the SAC using an approach, to ensure that the sediment was available to replenish the sandbank features;
- avoiding the risk of spreading non-native invasive species by following relevant regulations and guidance; and
- an Outline Written Scheme of Investigation (WSI) setting out the methodology for all proposed embedded mitigation takes account of the standards and guidance in Model Clauses for Archaeological Written Schemes of Investigation: Offshore Renewables Projects (The Crown Estates 2010).

ONSHORE MATTERS

5.2. TRAFFIC AND TRANSPORTATION

Background and policy context

Introduction

- 5.2.1. The ExA identified effects of Traffic and Transport as a principal issue [PD-006]. This section considers potential traffic and transport effects of the Proposed Development in relation to the onshore project area and the most probable routes that would be used for construction traffic.

National Policy Statements

- 5.2.2. The assessment for traffic and transport as set out in NPS EN-1, requires from the Applicant a transport assessment using a methodology stipulated by current Government guidance, to consult the relevant Highways Authorities, and to prepare a travel plan to mitigate transport impacts (NPS EN-1, Para 5.13.3, 5.13.4).
- 5.2.3. In reaching a decision the SoS should be satisfied that:
- a. an applicant has sought to mitigate the effects of the Proposed Development on the surrounding transport infrastructure, including during the construction phase (NPS EN-1, para 5.13.6);
 - b. where mitigation is needed, possible demand management measures have been considered before the provision of new inland transport infrastructure to deal with remaining transport impacts (NPS EN-1, para 5.13.8); and
 - c. significant adverse impacts relating to noise are avoided, mitigated and minimised (NPS EN-1, Para 5.11.9).
- 5.2.4. The SoS may attach requirements to a consent to control numbers of Heavy Goods Vehicle (HGV) movements, on the routing of such movements, to give consideration to the provision for HGV parking, and to ensure arrangements for abnormal disruption (NPS EN-1, para 5.13.11).

Other legislation and policies

- 5.2.5. The legislation and guidance relevant to Traffic and Transport is set out in the Environmental Statement (ES) Chapter 24 [APP-237 Section 24.2.3]. Key legislation and policies are identified in Chapter 3 of the ES [APP-216]. The Applicant's Planning Statement sets out the national, regional and local planning policies that are considered relevant to the Proposed Development [APP-693].

The application

Environmental Statement

- 5.2.6. The ES Chapter 24 Traffic and Transport [APP-237] provides an overview of the potential Traffic and Transport effects and the associated

mitigation for the construction, operation and decommissioning of the onshore elements of both Scenario 1 and Scenario 2 of the Proposed Development. Related documents and maps that provide relevant details for development activities and the proposed mitigations are:

- a. Outline Traffic Management Plan (OTMP) [APP-699];
- b. Outline Travel Plan (OTP) [APP-700];
- c. Outline Access Management Plan (OAMP) [APP-701];
- d. Public Rights of Way (PRoW) Strategy [APP-695];
- e. Access to Works Plan [APP-011];
- f. Temporary Stopping up of Public Right of Way Plan [APP-012];
- g. Streets to be Temporarily Stopped up Plan [APP-013]; and
- h. Private Means of Access to be Permanently Stopped up Plan [APP-019].

- 5.2.7. Figures which accompany ES Chapter 24 are provided in Volume 2 Figures [APP-452] to [APP-468]. Several appendices also support the ES chapters [APP-616] to [APP-656]. Potential effects of Traffic and Transport inter-relate with a number of issues including Noise and Vibration, Health, Construction, and Air Quality. These are discussed in relevant sections of this Recommendation Report where relevant.

Scope

- 5.2.8. The Traffic and Transport assessment for the Proposed Development is based on forecasts of background levels of traffic for 2023 for Scenario 1 and 2026 for Scenario 2 as these are anticipated to be the years when construction would take place under each Scenario. A total of 108 highway links within the Traffic and Transport study area have been assessed for the effects of severance, pedestrian amenity, road safety and driver delay [APP-453] [APP-454].
- 5.2.9. The Applicant's assessment is based on the methodology proposed within the Scoping Report (May 2017), while transport specific methodologies as prescribed in the Guidelines for the Environmental Assessment of Road Traffic (1993) have been used to refine the assessment of significance. Operational traffic effects have been scoped out of the assessment due to the limited traffic movements required. The overall methodology and approach to assessment has been agreed with the stakeholders during the Expert Topic Group (ETG) meetings, including the Highway Authorities [APP-237, Section 24.3].

Mitigation proposed

- 5.2.10. Embedded mitigation that is common across the Proposed Development is set out in Section 5.1 of this Recommendation Report. Embedded mitigation for Traffic and Transport applicable to both scenarios includes provision of side accesses, measures to minimise HGV movements, and reducing employee movements on local routes [APP-237, Table 24.15]. Embedded mitigation for Scenario 2 only includes locating mobilisation areas close to main A-roads to minimise impacts on local communities and use of local roads, identification of suitable access points and

optimum routes for construction traffic during duct installation [APP-237, Table 24.15].

- 5.2.11. Standard mitigation includes the measures set out in the OTMP [REP18-022]. OAMP [REP10-022] and OTP [APP-700] set out the standards and procedures which would be used to manage any impacts of HGV traffic and employee traffic during the construction period. The OTMP, OAMP and OTP would form the basis of a final Traffic Management Plan (TMP), Access Management Plan (AMP) and the Travel Plan (TP) to be approved by the relevant planning authority, in consultation with the highway authority, as secured through Requirement 21 (R21) and R22 of the dDCO [REP18-011].
- 5.2.12. Enhanced TMP measures are proposed where significant effects would still arise following embedded mitigation, enhanced mitigation is considered in the OTMP, including driver training, parking controls, monitoring and reporting and complaint response standards.
- 5.2.13. Further mitigation is proposed for the following specific Links in Scenario 2, in addition to enhanced TMP measures [APP-237, Table 24.38]. Links 34, 68 and 69 were subject of discussion during Examination and have been discussed later in the Section.
- a. Link 34 (B1145 – west of Cawston);
 - b. Links 42 (B1145 – Reepham Road);
 - c. Links 47c (North Walsham Road – Edingthorpe Green);
 - d. Link 49 (B1159);
 - e. Link 68 (The Street / Heydon Road); and
 - f. Link 69 (Little London Road).

Local Impact Reports

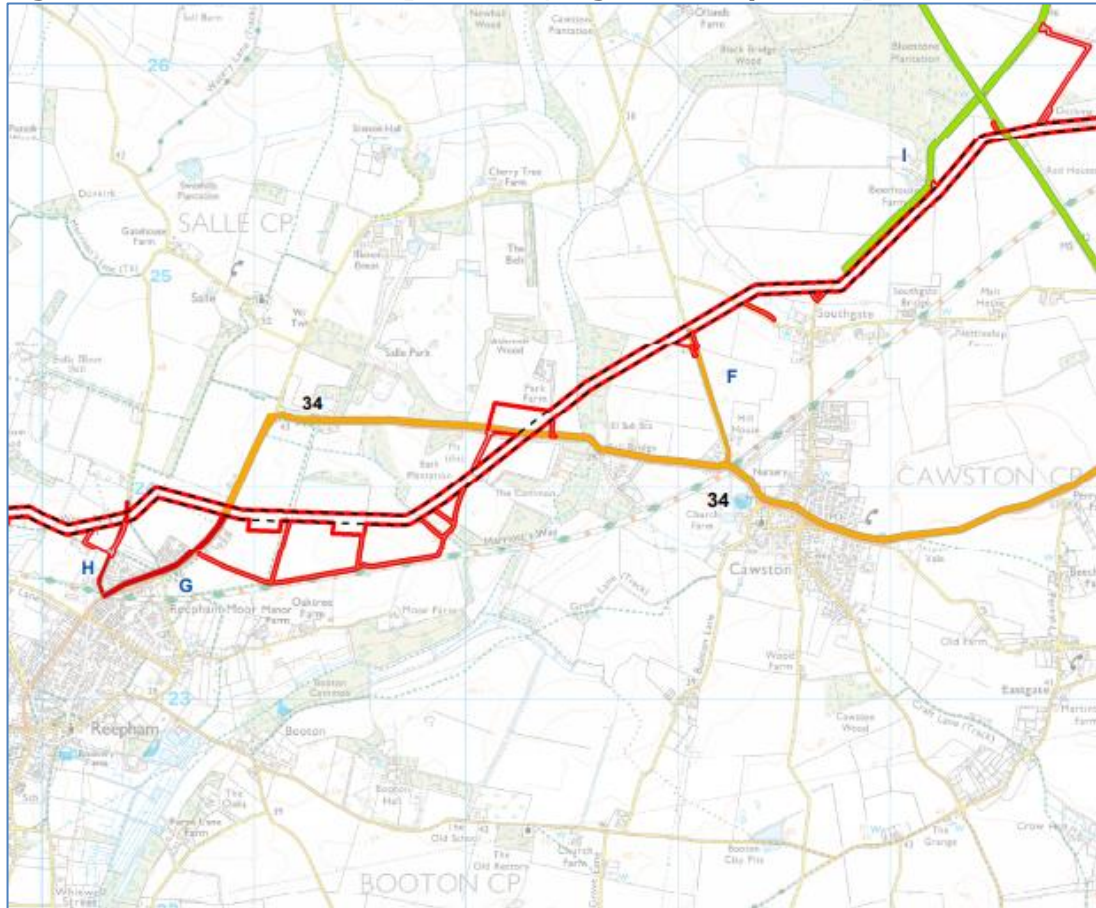
- 5.2.14. NCC, as the local Highway Authority, support the principle of the Proposed Development and state that for Scenario 1 the traffic impact from the cable pull, although not yet assessed, was not expected to be significant. For Scenario 2, NCC highlights that there are outstanding issues that need to be resolved. NCC did not elaborate on its concerns in the LIR and pointed to issues raised during the Norfolk Vanguard OWF Examination [REP2-085].
- 5.2.15. Broadland DC defers to NCC on matters relating to Traffic and Transport and other areas. However, it expresses concerns regarding the cumulative impacts of the construction traffic which could arise from the (now consented) Norfolk Vanguard OWF, the proposed Hornsea Project Three OWF with the Proposed Development on the villages of Oulton and Cawston and surrounding areas. While Broadland DC welcomes the opportunity to engage and comment on the mitigation proposed by the Applicant to alleviate the effects, its focus is on the effects construction traffic would have in terms of noise, vibration and cultural heritage on receptors located in Cawston and Oulton [REP2-065]. As such, Broadland DC's LIR has been discussed in greater detail under Sections 5.5 and 5.16 of this Recommendation Report.

Issues

Cawston Link 34 – Highway Intervention Scheme

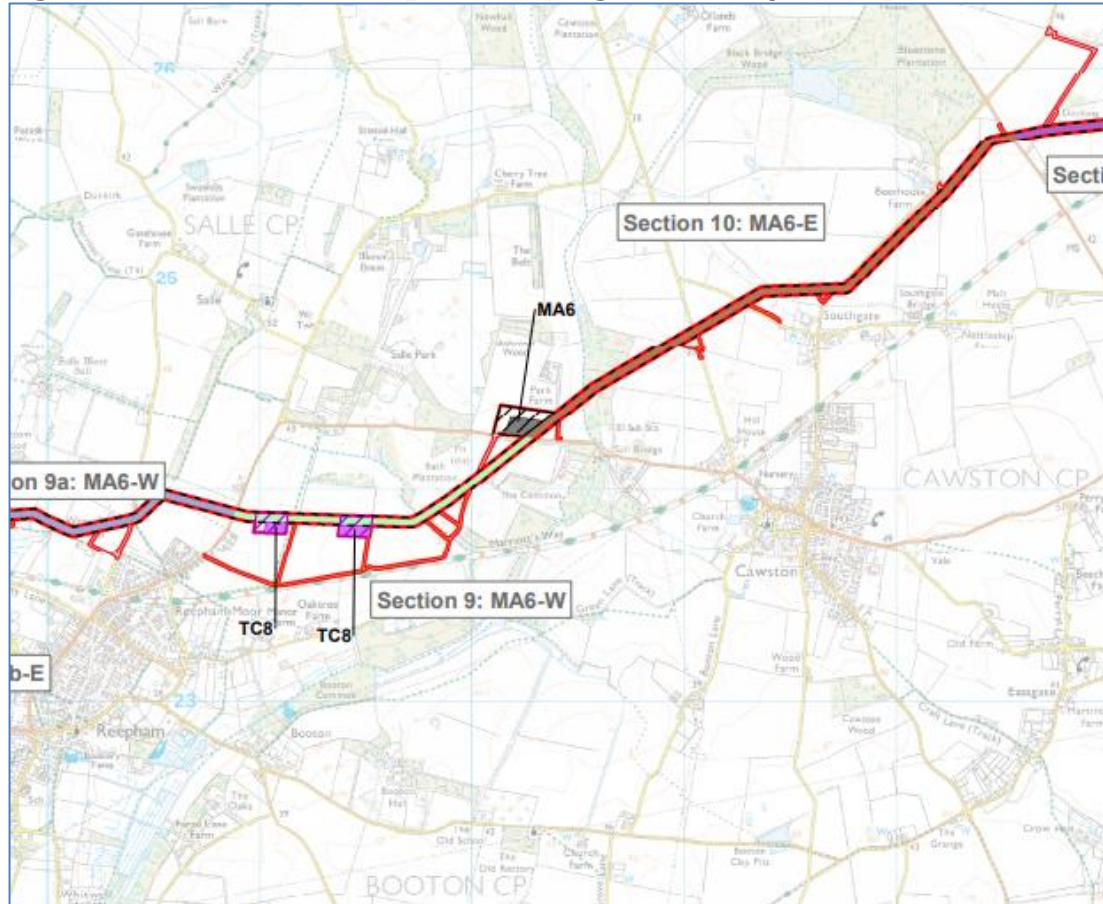
- 5.2.16. The effect of increased construction HGV traffic through the village of Cawston was an issue that was extensively discussed through the Examination. The concerns were largely to do with the suitability of Link 34 for two-way HGV traffic and the quantum of increase of HGV traffic, particularly the cumulative effect of the Proposed Development Scenario 2 with Hornsea Project Three OWF. As such the effect of construction traffic for the Proposed Development and the cumulative effects have been discussed together in this section.
- 5.2.17. The B1145 is a single carriageway road that provides a link from Kings Lynn to Mundesley on the Norfolk coast, and runs through a number of small towns such as Reepham, Cawston, Aylsham and North Walsham. Link 34 is the part of the B1145 from the B1149 Holt Road junction, through Cawston village to the eastern extents of Reepham [APP-237] [APP-456, Map 5 of 9]. It would be used to access mobilisation area MA6 serving Cable Sections 9, 9a and 10; and trenchless crossing TC 7 and 8 [APP-237, Table 24.65].
- 5.2.18. A combination of plans in the application material provide an overview [APP-456, Map 5 of 9] [APP-463, Map 5 of 9] [APP-467]. The first of the following figures is an extract from Figure 24.5 Link Sensitivity and shows a part of the cable corridor route and construction routes through Cawston, including Link 34 [APP-456, Map 5 of 9].

Figure 5.2.1: Extract from [APP-456, Fig. 24.5 Map 5 of 9]



- 5.2.19. The second figure is an extract from Figure 24.12 Scenario 2 and shows components of the onshore infrastructure in the Cawston area [APP-463, Map 5 of 9].

Figure 5.2.2: Extract from [APP-463, Fig. 24.12 Map 5 of 9]



- 5.2.20. In the ES [APP-237, Table 24.10, 24.28, 24.32, 24.39] it is stated that the Annual Average Daily Traffic 2017 baseline on Link 34 would be 29 HGVs in 2026 Scenario 2, which is the worst case scenario. Link 34 would be one of the highway links shared by the Proposed Development Scenario 2 and Hornsea Project Three OWF [APP-467]. The cumulative construction traffic for both projects is predicted to be 351 HGV movements, which would be a 1211.6% increase from baseline [APP-237, Table 24.51, 24.52] [APP-655]. Receptors would experience a peak flow of 56 HGVs per hour during the defined hours of construction (eight hours) [APP-237, Table 24.55]. The Applicant concludes a major adverse significant cumulative effect at Link 34.
- 5.2.21. The overlapping weekly HGV profiles for Link 34 for the Proposed Development and Hornsea Project Three OWF is a range of 351 to 260 cumulative daily movements, for four non-consecutive weeks. HGV movements for 39 weeks would range between 215 to 136 cumulative daily movements [APP-655]. In addition to an enhanced TMP, the Applicant has committed to further mitigation, and proposed a Highway Intervention Scheme (HIS) [REP10-018, Section 4.3.2] [REP18-024, Appendix 6].

Assessment of Link 34 as a medium sensitivity route

- 5.2.22. The Applicant has assessed Link 34 as a medium sensitivity route in Appendix 24.2 Link Sensitivity Rationale [APP-617], where it is described

as a main (B) road with direct frontage development, narrow footway, and resident parking along the route.

- 5.2.23. The ExA asked the Applicant and NCC for justification for the classification of Link 34 as a medium sensitive route. In response to ExA's WQ1, NCC stated that it did not consider Link 34 to be a medium sensitive route [REP2-084, Q.14.0.7].
- 5.2.24. The Applicant responded that NCC, the Highway Authority, had classified the B1145 as a Main Distributor, which indicates that it is not subject to any restrictions on HGV, despite the concentration of sensitive receptors at Cawston [REP2-021, Q14.0.7]. The more important matter here is that the ES has found moderate adverse effects on Link 34 which would be deemed significant in EIA terms and therefore the HIS is being developed and assessed to reduce the residual impact below significant levels [REP2-021, Q14.0.7].
- 5.2.25. The ExA notes that the NCC route hierarchy has categorised the B1145 as a Main Distributor [APP-616]. The ExA acknowledges that Link 34 has constricted highway and footway, but in light of the Highway Authority's Main Distributor classification, the ExA accepts that on balance medium sensitivity classification is appropriate.
- 5.2.26. Additionally, the ExA notes NCC accepts it is possible to produce a suitable access strategy to reduce cumulative construction traffic effects on Cawston to not significant [REP2-084, Q.14.0.7]. The ExA considers that despite the disagreement between NCC and the Applicant regarding the severity of the effects, it was agreed between parties that the effects could be mitigated with a suitable HIS. The ExA agrees with this outcome and considers that the effectiveness of the HIS would be the critical issue to address and agree.

Effectiveness of the Highway Intervention Scheme

- 5.2.27. The HIS for Link 34 as submitted to the Examination is set out in the OTMP [REP1-023, Section 4.3.2]. The HIS was initially developed by Hornsea Project Three OWF to mitigate construction traffic impacts through Cawston and was subsequently adopted by Norfolk Vanguard OWF, and the Proposed Development. The proposed HIS was developed to mitigate impacts for Hornsea Project Three OWF alone, Norfolk Vanguard OWF alone, the Proposed Development alone, equally, it would provide mitigation for the three projects when considered cumulatively.
- 5.2.28. The key measures in the HIS would be to cap daily HGV movements to 112 for the Proposed Development, restrict HGV movements during school pick up and drop off times, enhanced pedestrian facilities such as wider footways, controlled parking, road safety measures (vegetation pruning, signage etc), and street lighting enhancements. NCC stated that the current HIS was still work in progress, had failed to pass the road safety audit (RSA) and needed several changes. However, NCC also acknowledged that it believed a suitable strategy that mitigates cumulative traffic effects could be produced [REP2-050].

- 5.2.29. During the Examination, the Applicant acquired topographical data and collaborated with Cawston PC to undertake kerbside parking surveys to inform revisions to the HIS. The Applicant gave an overview of the revised HIS at the ASI [EV8-002] and subsequently submitted it at D4 [REP4-016]. The revised HIS overview and plans are in two documents in the OTMP [REP18-022, Section 4.3.2] [REP18-024, Appendix 6]. In summary, the key measures included in the revised HIS includes a HGV cap of 112 daily movements, and a managed cumulative traffic demand to no greater than 239 daily HGV movements. The revised HIS also includes a 20mph speed restriction, hazard warning signs, controlled parking, vegetation maintenance, carriageway re-alignment and resurfacing. A corresponding RSA was submitted with a decision log and recommendations [REP5-055]. The Applicant responded to each problem, accepting the recommendations which is reflected in the final OTMP as indicated against each point raised [REP10-017, Section 4.3.2] [REP10-019, Appendix 6].
- 5.2.30. In response to the RSA, NCC expressed a concern that the HIS could fail if parking occurs outside the designated parking areas, if traffic fails to yield at the correct points, or if traffic speeds are much higher than 20mph [REP10-050]. NCC also stated that the only way to address this issue would be to reduce the volume of traffic passing through Cawston from 239 HGV movements per day until a point is reached where there is no longer a compliance issue, notwithstanding this would lengthen the duration of the project.
- 5.2.31. Subsequently the Applicant in consultation with NCC submitted a range of measures to enable targeted intervention on validation of a driver compliance issue. This included measures to reduce the cumulative HGV cap (set at 239 cumulative HGV movements in the proposed HIS) by ensuring that the Proposed Development and Hornsea Project Three OWF traffic demand would not overlap; and incrementally reducing the volume of traffic passing through Cawston from 239 HGV movements through targeted intervention informed by monitoring in consultation with NCC. The details of the monitoring scheme would be agreed with NCC pre-commencement and secured in the final TMP. It would include measures such as installation of cameras, daily review and reporting of footage, address complaints immediately, and share live feed shared with NCC. The revised HIS and the monitoring process is set out in the OTMP [REP18-021, Section 5.6].
- 5.2.32. The Applicant also highlighted the information recently submitted to Examination at D14 [REP14-043] where Hornsea Project Three OWF present refined profiling of HGV demand. This information has replaced the Maximum Design Scenario (127 HGV daily movements over 11 months), with a breakdown which suggest that peak construction HGV total of 127 daily movements would occur for a maximum of only one month, and range between 62-68 daily HGV movements for the remaining ten months. The Applicant explained that this re-affirms the Applicant's assertion in the OTMP that the HGV peaks for the Proposed Development and Hornsea Project Three can be managed post-consent so as to not overlap to significantly reduce potential cumulative impacts.

The Applicant also clarified that the revised HGV traffic data from Hornsea Project Three OWF would ensure that overall HGV demand could be reduced without the need to extend the construction programme or change any other parameters on which the cumulative assessment was based [REP14-036, Q5.14.1.1].

- 5.2.33. NCC confirmed in a Joint Final Position Statement [REP11-016] and at the ISH5 [EV14-003] [EV14-004] that the Applicant's proposed amendments to the OTMP [REP18-021, Section 5.6] [REP18-024, Appendix 6], are satisfactory and sufficient to address the driver compliance issue. NCC shares the Applicant's confidence that the cumulative HGV peaks can be managed post consent, as agreed in the final SoCG [REP16-012]. At the close of the Examination it was agreed by NCC that the revised HIS for Link 34 [REP10-017] would be sufficient to mitigate against the significant effects arising from the Proposed Development in terms of pedestrian amenity; including the cumulative scenario with Hornsea Project Three OWF. This has been recorded in the final SoCG [REP16-012].
- 5.2.34. Cawston PC and several residents of Cawston have held the position that Cawston High Street (Link 34) is not suitable for construction HGV traffic generated by the Proposed Development and in particular, for the cumulative traffic for Hornsea Project Three OWF should the Order be made. The main concerns were regarding narrow footpaths, pedestrian safety, loss of roadside parking, effects on air quality and on properties close to the High Street, as evidenced at OFH1 [EV4-001] [REP1-043] and [REP2-067].
- 5.2.35. In response to ExA WQ2 regarding the revised HIS [REP4-016, 14.0.6], Cawston PC and residents maintained their position throughout the Examination [REP4-016, 14.0.6], [REP5-054], [REP5-062], [EV13-012], [REP13-019].
- 5.2.36. The Applicant responded to the Cawston PC and residents' concerns [REP6-014]. The Applicant has relied on a successful RSA and its agreement with Highway Authority (NCC) to reaffirm the effectiveness of the revised HIS to mitigate cumulative construction traffic effects in Cawston [REP13-019].
- 5.2.37. The resident of Whitehouse Farm raised concerns about the already restricted visibility when exiting the private access to their property, and if this would be made worse by the HIS [EV13-012] [REP13-051]. After a site visit with the resident, the Applicant submitted a technical note with its analysis, stating that a vehicle egressing the property in baseline conditions would have to encroach on the carriageway by approximately 1.7m to achieve safe visibility. With the realignment of the High Street (part of revised HIS), while a vehicle leaving Whitehouse Farm would still need to encroach the carriageway (200mm more than baseline), it would have the requisite forward visibility. Moreover, a vehicle waiting at the yield point would have visibility to a vehicle leaving Whitehouse Farm [REP14-044] [REP14-036, Q5.14.1.1]. The resident was not satisfied with the analysis, and felt that their visibility of an HGV would be made

worse with the HIS, that there was potential for a log jam scenario at the entry/ exit to Chapel Street, and that weather conditions and lighting had not been fully accounted for [REP14-076] [REP14-077] [REP15-012].

- 5.2.38. Throughout the Examination the ExA encouraged dialogue between IPs at Cawston, NCC, and the Applicant, to see if there could be resolution regarding the revised HIS to alleviate the concerns raised by the Parish Council and residents. But there was sustained disagreement which is summarised in two position statements [REP5-054] and [REP13-019]. At the close of the Examination Cawston PC held its position that the village is unsuitable for HGVs, and pedestrian safety was at risk from HGV traffic. Cawston PC went on say that it does not agree with NCC that the revised HIS is technically feasible [REP13-028].
- 5.2.39. IPs and the ExA sought confirmation whether the revised HIS would be adopted by all schemes assessed in the CIA, namely Norfolk Vanguard OWF and Hornsea Project Three OWF at OFH3 [EV13-012], ISH5 [EV14-003] [EV14-004] and through WQ4 [PD-016, Q4.14.1.6] and WQ5 [PD-022, Q5.14.1.4].
- 5.2.40. The Applicant responded [REP10-034, Q4.14.1.6] that the SoCG with Ørsted (the developer of the Hornsea Project Three OWF) confirms that there is agreement on the revised HIS [REP8-011, Appendix 6] between the Applicant, Norfolk Vanguard OWF and Hornsea Project Three OWF, and that all three CIA schemes are committed to implement the revised HIS as a single project mitigation or cumulative project mitigation [REP18-032]. The Applicant highlighted at ISH3 [EV6-001] to [EV6-006] that the made DCO for Norfolk Vanguard R21(5) [REP13-029], secured the implementation traffic mitigation for Link 34, which is consistent with the Proposed Development OTMP. Both NCC and Broadland DC confirmed at the ISH3 that approval of the TMP for the first of the three CIA schemes to construction would be contingent on it including the revised HIS for Link 34.
- 5.2.41. The ExA notes that the Ørsted Hornsea Project Three OWF has Protective Provisions added to the dDCO [REP18-011] at Schedule 17, Part 8. The ExA notes the detail of the Protective Provisions including that "*...the undertaker and Ørsted must each act in good faith and use reasonable endeavours to co-operate with, and provide assistance to, each other as may be required to give effect to the provisions of this Part (of the dDCO)*" [REP18-011, para 94] and is satisfied that the Protective Provisions secure ongoing and future cooperation between the parties. The SoCG does not record any disagreement over the drafting of the Protective Provisions [REP18-032].

ExA's reasoning

- 5.2.42. The Hornsea Project Three OWF Order having now been made, the ExA notes that the implementation of the revised HIS could result in the worst case scenario of maximum cumulative HGV movements through Cawston of 239 daily movements for four weeks (not consecutive) out of the total 48 week construction period. For a further 23 weeks out of the total 48 week period the typical daily movements would range between

167-215 daily cumulative movements. This is only marginally reduced from the worst case scenario.

- 5.2.43. The restriction to HGV movements during school pick up and drop off times during term time is welcome, but it reduces the period over which the daily HGV movements can be distributed. As such, the time restrictions would increase the frequency of HGV movements, potentially worsening the effects on residents for the rest of the day.
- 5.2.44. As such, the ExA acknowledges that despite the implementation of the cap on cumulative numbers through the revised HIS, the quantum of HGV movements through Cawston High Street would increase significantly and would be at high frequency in terms of numbers per hour. The ExA is sympathetic to the concerns raised by residents and Cawston PC, and notes that they are similar to one of the issues highlighted in the RSA regarding risk to pedestrians due to the narrowness of the footway and the proximity that HGVs would have to pedestrians.
- 5.2.45. On the other hand, the ExA considers that progress was made during the course of the Examination with the revised HIS and the OTMP. The ExA notes that the HIS has passed the RSA, and both the HIS and OTMP are now agreed with NCC. While NCC raised concerns about the effectiveness of the revised HIS given its reliance on driver compliance, it was eventually satisfied that this can be adequately addressed by the latest revisions to the OTMP that included the monitoring and enforcement programme [REP18-021, Section 5.6].
- 5.2.46. Turning to the matter of Whitehouse Farm, the ExA observed on its site inspections [EV8-002] that the B1145 is tightly constrained at the corner with Whitehouse Farm. The ExA is of the view that vehicles entering and leaving Whitehouse Farm are already required to do so with caution, given the layout of parking at the property in relation to the B1145. The ExA is satisfied that the Applicant has taken into account the existing difficulties of access onto the B1145 at this location. The ExA is satisfied that the Applicant has taken into account the existing difficulties of access onto the B1145 at this location. The ExA acknowledges that the proposed realignment of the B1145 High Street would not overcome this historic difficulty and vehicles leaving Whitehouse Farm would still be required to encroach onto the highway. However, at 200mm more than baseline position, the ExA does not consider this difference to be material. The ExA notes that NCC did not weigh on the matter in response to ExA's WQ5 [REP14-052, Q5.14.1.1]. The ExA is persuaded by the Applicant that vehicles exiting Whitehouse Farm would be visible to other vehicles waiting at the yield location and that the introduction of the 20mph speed limit in this location would provide a benefit from the current scenario by slowing traffic down as it approached the corner outside the property.
- 5.2.47. The ExA also acknowledges there would be adverse effects of the increase in cumulative construction HGV traffic on the day to day life of

residents and businesses in Cawston. The ExA also takes into account the following matters:

- a. the classification of the B1145 as a distributor road by NCC, which shows that the Highway Authority considers it to be suitable for HGVs;
- b. B1145 is used by HGVs currently and the adverse effects from large vehicles is already a part of the current baseline;
- c. the revised HIS has a satisfactory RSA, and is considered effective mitigation for the cumulative traffic effects generated by the Proposed Development and Hornsea Project Three OWF by the Highway Authority (NCC);
- d. the revised HIS is agreed for implementations by the other projects included in the CIA; the commitment by Norfolk Vanguard OWF is in the made DCO, and commitment by Hornsea Project Three OWF is in the Protective Provisions in the dDCO;
- e. the post-consent monitoring and enforcement plan in the OTMP is agreed with the Highway Authority (NCC);
- f. after mitigation, the worst period (including the primary, secondary and third peak, and typical movements) for cumulative effects of construction traffic would extend for a period of 27 weeks out of the 48 week construction period in Cawston; and
- g. in light of the refined profiling of HGV demand by Hornsea Project Three OWF, the peak demand of 127 HGVs is now reduced from 11 months to one month, which goes some way in convincing the ExA that the Proposed development and Hornsea Project Three OWF HGV peaks can be managed post-consent so as to not overlap.

5.2.48. On the basis of the aforementioned factors and commitments, the ExA concludes that the revised HIS would mitigate the adverse effects of HGV movements associated with the Proposed Development alone and cumulatively with Norfolk Vanguard OWF and Hornsea Project Three OWF for the temporary periods when construction and other activities would create peak flows of HGVs. The measures are properly secured in the final iteration of the OTMP [REP18-022] and R21 of the rDCO.

Broadland DC – Noise and vibration from construction traffic

- 5.2.49. Broadland DC focussed on noise and vibration from construction traffic and effects on heritage assets. Noise and vibration matters are discussed here, while heritage matters are considered in Section 5.16.
- 5.2.50. Broadland DC confirmed that it agrees with the Applicant's assessment of potential noise, vibration and air quality effects of the revised HIS in its Clarification Note [REP8-028] but challenged the assumptions in relation to the weight of HGVs and their loads, and that HGVs would adhere to the 20mph speed limit in free flowing traffic. Broadland DC stated that the revised HIS requires HGVs to brake, stop, idle and accelerate on multiple occasions along the B1145, and consequently the actual noise levels could be 4dBA higher [REP10-045, Q4.1.2.1].
- 5.2.51. The Applicant in response maintained its position that the assessment had not identified any significant effects. However, in response to the

ExA's request for further information [REP14-038, 2], and in light of Broadland DC's outstanding concern, the Applicant agreed to undertake a scheme of noise impact monitoring. The SoCG with Broadland DC was not updated following the inclusion of the noise monitoring plan in the OCoCP, and Broadland DC did not make any further representations on the matter.

- 5.2.52. The ExA notes that the OCoCP [REP18-019, Section 9.2.3] includes the commitment to noise monitoring in Cawston. This would be developed as part of the Construction Noise Management Plan (CNMP), in the final Code of Construction Practice (CoCP) submitted to and approved by Broadland DC, in accordance with R20 of the dDCO [REP18-011]. The ExA, is content that if noise related issues arise, those would be addressed through the Cawston noise monitoring plan in the OCoCP, and this commitment is secured in R20 of the rDCO.

Cawston Link 34 – Alternative route for construction traffic

- 5.2.53. In response to the ExA's WQs about consideration of alternatives for construction traffic routes in Cawston and Oulton the Applicant stated that two alternative routes to avoid the B1145 through Cawston (Link 34) were considered during the Norfolk Vanguard OWF examination and subsequently dismissed because NCC has indicated that they would not accept any proposal to introduce a new access onto the B1149 [REP2-026, Appendix 14.2]. This was confirmed by NCC who stated that it was satisfied that the current proposal to take construction traffic through Cawston was the only viable option and that alternative routes were far worse in terms of adverse effects on highway [REP2-084, Q14.0.8]. On the other hand, Cawston PC explained that it had previously asked about the possibility of the use of an upgraded haul route along the cable route between Oulton and the west of Cawston, but that this suggestion was dismissed by the Applicant [REP2-067, Q14.0.8].
- 5.2.54. The matter was discussed at ISH3 [EV6-001 to EV6-006]. The Applicant reiterated its opinion that alternative routes including a haul route, would result in additional prolonged adverse effects. However, here NCC indicated that in light of detailed information recently submitted by the Applicant, NCC had changed its position and could consider temporary access from the B1149.
- 5.2.55. Given that there was not yet an agreement between the Applicant and NCC on the revised HIS, the ExA requested a position statement from the Applicant, NCC, Broadland DC and Cawston PC to consider the suitability of a haul route within the cable corridor, as an alternative to Link 34. The Applicant discussed five alternatives [REP5-054] with the IPs.
- 5.2.56. At the close of the Examination, Cawston PC and NCC expressed a preference for Option 2 involving diverting traffic away from the B1145 using a separate haul route from the B1149 parallel to the running track. This was in large part due to the change in position of NCC during the Examination, from previously being opposed to a temporary access of the B1149 to considering that such an access would be acceptable. Therefore, from NCC's point of view the possibility of a haul route would

be acceptable on highway grounds. NCC also stated that Option 2 would be its preferred option as it would have the potential to remove all construction traffic from Cawston. However, NCC also confirmed that it had no objection to the Applicant's revised HIS as set out in the OTMP [REP8-036].

- 5.2.57. The Applicant maintained its position that it was not appropriate to take forward an alternative haul route for environmental, construction and land requirement reasons [REP5-045, Q2.14.1.6]. The Applicant also argued that the haul route would constitute a new mitigation strategy, which had not been agreed with Norfolk Vanguard OWF or Hornsea Project Three OWF projects. The Applicant could not provide any assurance that if either of the other two CIA projects went to construction first, they would implement the haul route. And indeed if they did not implement the haul route then, it would be a wholly disproportionate mitigation for the construction traffic generated by the Proposed Development alone, especially considering that greater traffic was expected to be generated by Hornsea Project Three OWF [REP7-017, Q3.14.1.8]. Here the Applicant emphasised that NCC and the Applicant had already reached agreement that the revised HIS could mitigate effects of cumulative construction traffic on Cawston, and as such the Applicant is in fact not required to develop an alternative scheme [REP11-016].

ExA's reasoning

- 5.2.58. At the outset, the ExA wishes to distinguish between the revised HIS for Link 34, which is assessed in the ES and has passed an RSA; and on the other hand, other options explored in this Examination which have not been assessed in the ES, some of which would require land outside the Order limits. As such, the ExA believes it is not possible to compare the revised HIS and the other options like-for-like.
- 5.2.59. The ExA requested information about the alternative haul route in the Cawston area for two reasons:
- a. it was concerned about the cumulative effects on Cawston in relation to not only traffic but also noise and vibration; and
 - b. this was at a stage in the Examination when there was as yet no agreement with NCC (the Highway Authority) on the HIS.
- 5.2.60. The ExA acknowledges that NCC as the Highway Authority, Cawston PC, and Cawston residents unanimously support Option 2 to move construction traffic away from the centre of Cawston. However, this only came about as a result of NCC's position changing in the middle of the Examination; concluding that it would be feasible to create a temporary access off the B1149 to create an alternative haul route. It did not form part of the Applicant's application and therefore is not a fully worked up, alternative proposal.
- 5.2.61. Until such time as NCC indicated it was content with the HIS for mitigation, the ExA did consider that the alternatives discussed were important and relevant to the SoS's decision (NPS EN-1, para 4.4.3)

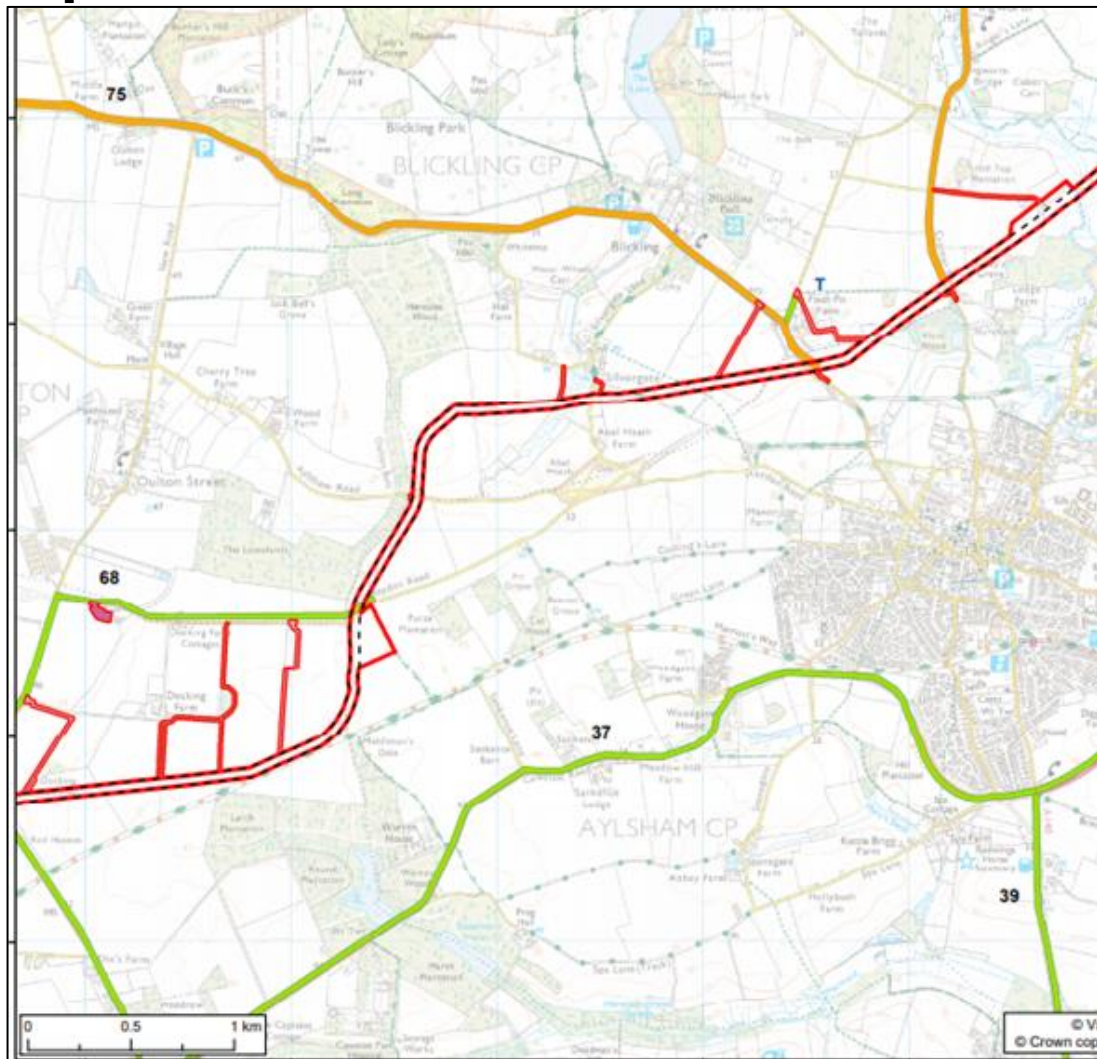
even though further environmental assessment and land negotiations would have been necessary for some options. However, in light of NCC's confirmation that it was content with the amended HIS, the ExA accepts that mitigation of the adverse cumulative effects on traffic and transport have been addressed and can be delivered through the HIS, set out in the OTMP and secured by R21.

- 5.2.62. The ExA appreciates Cawston PC's continued engagement on these matters, for providing such detailed local input throughout this extended period of the Examination. The ExA also acknowledges the point made in Cawston PC's closing statement regarding the need for ongoing cooperation between all parties should the Proposed Development be consented [REP18-033]. The ExA sets out more points for the SoS on adverse cumulative effects on communities in Section 5.22.

Oulton Link 68

- 5.2.63. Link 68 represents The Street at Oulton, starting from the junction with the B1149 to the junction with Heydon Road, continuing a further 1.5km along Heydon Road. The link is considered a low sensitivity route, as The Street and Heydon Road are local access roads with sporadic frontage developments. A combination of plans in the application material provide an overview of the Oulton area [APP-456, Map 4 of 9] [APP-463, Map 4 of 9] [APP-467]. The following figure is an extract from Figure 24.5 Link Sensitivity and shows a part of the cable corridor route and construction routes through Oulton, including Link 68 [APP-456, Map 4 of 9].

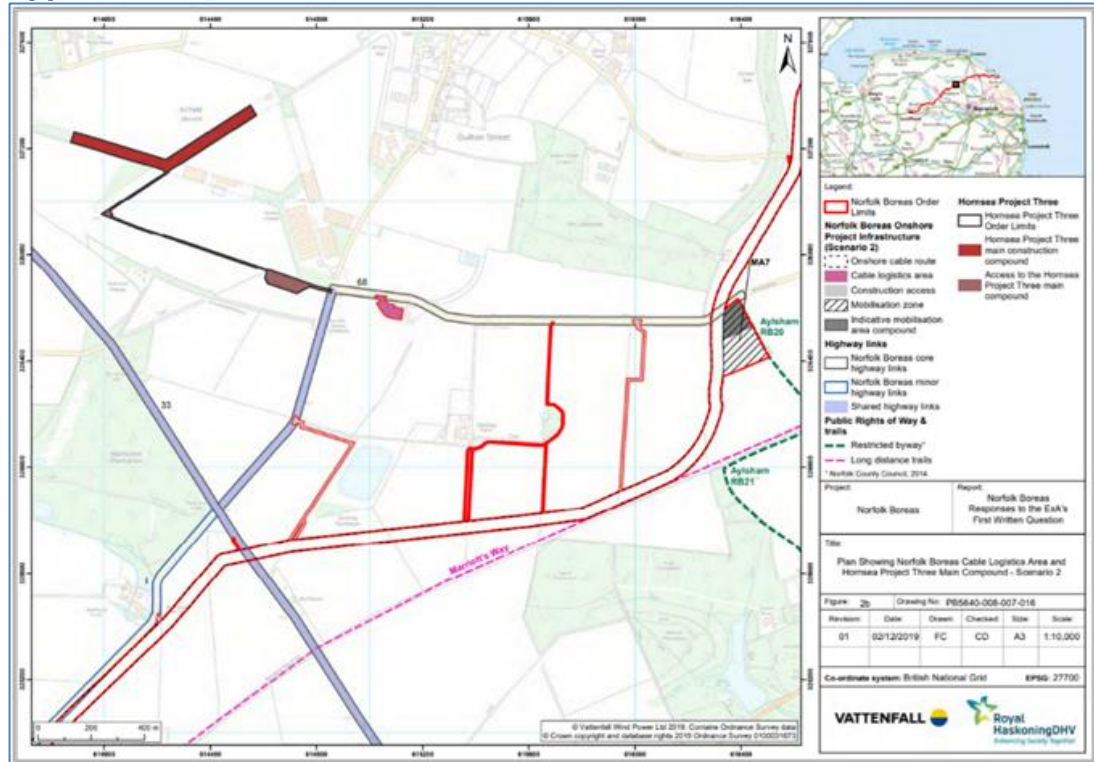
Figure 5.2.3: Extract from Figure 24.5 Link Sensitivity [APP-456, Map 4 of 9]



5.2.64. For the Proposed Development alone, Scenario 2 is the worst case scenario for a total construction period of 55 weeks, when HGV traffic would increase from 44 to 80 movements. This represents a 182.2% increase and was assessed as having a minor adverse effect, deemed not significant [APP-237, Table 24.52]. Link 68 would also serve Hornsea Project Three OWF's main construction compound at Oulton Airfield if consented.

Figure 5.2.4: Construction infrastructure and highway links for the Proposed Development and Hornsea Project Three OWF [REP2-023,

Appendix 4.3]



- 5.2.65. Cumulative effects could occur on Link 68 for both Scenario 1 and Scenario 2, but the potential overlap of Scenario 2 duct installation activities with Hornsea Project Three OWF onshore export cable works is assumed as the worst case cumulative effect by the Applicant [REP2-021, Q4.1.1].
- 5.2.66. The worst case cumulative traffic flows are predicted to be a total of 242 HGVs over a period of six consecutive weeks. This accounts for a baseline of 44 HGVs, and a cumulative increase of 198 HGVs (80 daily movements for the Proposed Development and 118 for Hornsea Project Three OWF) [APP-654]. The cumulative increase of 198 HGVs represents a 451.5% increase [APP-237, Table 24.55]. Receptors would experience a peak flow of 25 HGVs per hour during the defined hours of construction (approximately 10 hours). This is assessed to be a moderate adverse effect [APP-237, Table 24.69].

Baseline data and accounting for major events

- 5.2.67. Oulton PC expressed concerns regarding inadequacies in the baseline data used by the Applicant, the classification of Link 68 as a low sensitivity route, and the effects of HGV movement during major events such as during harvesting [REP2-094]. At ISH3 [EV6-001] to [EV6-006], the Applicant explained that the surveys undertaken by Hornsea Project Three OWF to determine baseline traffic, had been adopted for the Proposed Development. NCC agreed with the Applicant's general approach relating to baseline data and assessment of cumulative effects.

- 5.2.68. In response to the ExA's WQ2 regarding HGV movement during major events, the Applicant highlighted an aspect of the mitigation scheme where potential HGV peaks can be accommodated as set out in the OTMP [REP18-021, Section 3.3]. Additionally, the Applicant stated that the cumulative traffic assessment in the ES included agricultural vehicles during harvest periods. For a worst case scenario, it was concluded that there would be a delay of 38 seconds to the journey from The Street to the B1149; an effect deemed not significant in the ES.
- 5.2.69. The ExA notes that NCC as the Highway Authority has not raised concerns about the baseline data, and the methodology for assessment of the cumulative effects of construction traffic on Link 68. In light of no outstanding concerns from the Highway Authority, the ExA is content to accept the Applicant's approach to determining baseline data as sound. The ExA agrees with the Applicant that harvest peaks have been taken into account in the cumulative assessment.

Old Railway Gatehouse

- 5.2.70. The Applicant has proposed a Highway Mitigation Scheme (HMS) in the OTMP to address the adverse effects of construction traffic on Link 68 cumulatively with Hornsea Project Three OWF [APP-237, Table 24.64], which would include improvement of the existing bell-mouth junction between The Street and the B1149 (Holt Road), up to eight passing places to accommodate HGV opposing traffic, widening of The Street near Dorking farm access, trimming of vegetation, and temporary lowering of the existing 60mph speed limit to 30mph [REP18-022, Section 4.3.3]. The residual effects are assessed to be minor adverse [APP-237, Table 24.69].
- 5.2.71. The Old Railway Gatehouse is a dwelling fronting on to The Street in Oulton. Broadland DC [REP2-065] [REP6-026] and Oulton PC [REP2-094] raised concerns about the adverse effect construction traffic would have on the Old Railway Gatehouse. The residents of the property also submitted their concerns into the Examination [REP7-071]. These were primarily to do with the adverse effects that construction traffic would have on their quality of life.
- 5.2.72. The HMS [REP18-021, Table 4.2] for Link 68, would include specific measures to reduce the effects of construction traffic on the property. The Applicant stated that following the implementation of the mitigation measures, the residual adverse effect would be minor adverse and not significant [APP-237, Para 496].
- 5.2.73. The Applicant has offered optional measures including acoustic glazing and a 2m high acoustic barrier (wall) to minimise further the potential perceived disturbance to the residents. However, the Applicant stated that the optional measures were not necessary to mitigate the adverse effects of construction traffic to non-significant [REP7-017].
- 5.2.74. In response to WQ3, Broadland DC [REP7-036, Q3.12.2.2] confirmed that no further mitigation would in its view, be required to address the cumulative effects from construction traffic passing the property. It

agreed that the OTMP would provide sufficient controls [REP10-036]. The representations for the property were made to the Examination at OFH3 [EV13-010], and in writing [REP7-071]. Despite the additional proposed mitigation measures, the IPs including the residents of the property were not satisfied. Subsequently the residents [REP10-066], requested further alterations to their property. The Applicant agreed to consider extending the physical alterations but stated that the final agreement would only be reached post consent [REP11-007].

ExA's reasoning

- 5.2.75. The ExA acknowledges that traffic on Link 68 would be greater during the construction of the Proposed Development. As a worst case scenario, residents and road users of Link 68 would experience a total of 25 HGV movements per hour for approximately 10 hours a day. The ExA is particularly sympathetic to the residents of Old Railway Gatehouse, who would be most affected on a day-to-day basis, by the increase in HGV traffic.
- 5.2.76. However, the ExA considers that Link 68 is a road of reasonable width, with good visibility and relatively few sensitivity receptors (besides Old Railway Gatehouse). As such, the ExA considers that the proposed use of Link 68 for construction traffic in principle is acceptable. Additionally, the ExA also notes that this would be a temporary effect; while the total construction period effecting Link 68 is 55 weeks, the worst case would be six consecutive weeks.
- 5.2.77. The ExA gives weight to the views of NCC who raised no objections to the HMS proposed by the Applicant to mitigate the cumulative effects of HGV traffic on Link 68 confirmed in the final SoCG [REP16-012]. The ExA also gives weight to the views of Broadland DC who are satisfied that the HMS would effectively mitigate the adverse effects of increase in HGV traffic on Old Railway Gatehouse specifically, confirmed in the final SoCG [REP10-036].
- 5.2.78. For these reasons, the ExA is satisfied that the temporary increase in traffic outside Old Railway Gatehouse, would be adequately mitigated by the HMS and property improvements included in the OTMP and secured by R21 of the rDCO.

Outline Access Management Plan and Access to Works Plan

- 5.2.79. In response to ExA WQ3 and WQ4, the Applicant explained that the Outline Access Management Plan (OAMP) [APP-701] details the proposed accesses which would be required for the construction phase of the Proposed Development in Scenario 1 and 2, whereas the Access to Works Plans [APP-011] provides graphical details of all proposed accesses, whether they would be required for construction or operation of the Proposed Development.
- 5.2.80. The Applicant updated the OAMP with Appendix 4 to provide a full list of all proposed accesses during construction and operation in both scenarios [REP10-021]. Chapter 8 Compulsory Acquisition of this Recommendation

Report considers in more detail objections in relation to specific access matters.

ExA's reasoning

- 5.2.81. The ExA is content that R21(c) of the rDCO secures the submission of an Access Management Plan which must be in accordance with the OAMP. R21 also ensures that the Access Management Plan must be approved by the relevant planning authority in consultation with the highway authority. R22 of the rDCO secures the details of the access management plan and that they must be constructed or altered in accordance with approved details before they could be brought into use.

Port-related travel plan(s)

- 5.2.82. The ExA questioned the Applicant and NCC about mechanisms that would be used to assess and mitigate any adverse cumulative Traffic and Transport effects at the port(s) and whether any provision should be made in the OTMP and/or the OTP. The Applicant acknowledged the need to consider potential effects arising from employee and HGV movements for offshore construction at the base port(s) but stated that this would be assessed when the port is decided upon [REP14-036, Q5.4.0.6]. NCC raised no concerns while Highways England stated that any potential cumulative effects associated with the base port and trunk roads could be determined and considered through ongoing engagement with the Applicant [REP16-019, R17.1.8].
- 5.2.83. NCC also provided wording for a travel plan requirement for the onshore port-related traffic, which had been included in the East Anglia One OWF DCO, should it be needed. The Applicant considered that NCC's response aligned with its own, which is that there are mechanisms in place to ensure impacts are assessed either through port operating permissions or as part of a separate planning permission should new facilities be required. Therefore, the Applicant believed an additional requirement was not needed. The Applicant also provided without prejudice revised wording to that submitted by NCC in case the ExA and the SoS are minded to include a port-related travel plan requirement for offshore works [REP15-003, Q5.4.0.6].

ExA's reasoning

- 5.2.84. The ExA has decided to recommend the inclusion of this requirement to the SoS and has added it in as new requirement, R36, using the wording submitted by NCC as revised by the Applicant. This would require travel plan(s) for onshore port-related traffic to and from the base port(s) to be submitted to and approved by the relevant planning authority prior to the offshore works commencing. The ExA has also added R36 to Schedule 16 as a requirement to which the discharge procedures set out would apply.
- 5.2.85. The ExA is aware this differs from the Norfolk Vanguard OWF made Order. However, the ExA considers this is necessary because the relevant local authorities which would consider this matter have not engaged with this Examination, because at present the port locations(s) are not known.

The inclusion of this requirement is also felt to be important because of the potential cumulative effects at base ports with onshore port-related traffic from several OWFs. This requirement would give the relevant planning authority the opportunity to engage with the undertaker over the detail of this matter at an appropriate time, when it was aware of other relevant proposed and consented developments.

Decommissioning

- 5.2.86. The Applicant argues that for decommissioning, the effects on links serving the cable route works would be significantly less than the construction phase, and effects on those links primarily serving the onshore project substation would be no worse than construction.
- 5.2.87. While details of activities expected to be undertaken during decommissioning would be determined later, the Applicant states that the worst case scenario for decommissioning would mirror that of construction. Methodology for assessing decommissioning would be developed in consultation with the relevant authorities and statutory bodies [APP-237, para 411 and 413].
- 5.2.88. No representations were received in relation to decommissioning during the Examination. The ExA has no reason to disagree with the Applicant's approach.

Conclusions

- 5.2.89. The ExA finds that the Applicant's proposed mitigation measures discussed in this Section have developed during the course of this Examination and have been agreed with Highways England and NCC (the local highway authority). The ExA believes that the effects of the construction HGV traffic generated by the Proposed Development and cumulatively with Hornsea Project Three OWF would be mitigated, to an extent, with the revised HIS in Cawston and the HMS in Oulton secured in the OTMP and R21 in the dDCO. While the ExA accepts the NCC's approval of the revised HIS and HMS, the ExA concludes that the adverse effects on the local highway network and on local communities would be significant despite the proposed mitigation.
- 5.2.90. The ExA is content that if noise-related issues arise due to increased HGV traffic and the revised HIS they would be addressed through the noise monitoring plan in Cawston, developed as part of the CNMP, in the CoCP in accordance with R20 of the rDCO.
- 5.2.91. In accordance with NPS EN-1 paras 5.13.3 and 5.13.4, the ExA is content that Applicant has provided a transport assessment and accompanying travel plan. The ExA concludes that the mitigation secured in R21 (OTMP) and R20 (CoCP) of the rDCO would ensure that the Proposed Development meets the policy requirements of NPS-EN1 paras 5.13.6, 5.13.8 and 5.11.9. It also accords with the relevant policies in the NPPF.
- 5.2.92. The construction HGV traffic generated for the Proposed Development would inevitably have significant effects on the local network, and most

significantly for the residents and businesses at Cawston and Oulton. In addition, construction traffic would also need to access narrow, rural lanes in Breckland and North Norfolk. The ExA considers that the major issue here is that the cumulative effects of the construction traffic of OWFs could in time be much greater than what has been assessed in the CIA. While the ExA accepts the scope and findings of the CIA submitted in this application, it considers the cumulative effects of construction traffic of future OWFs could generate greater stress on the local network and indeed on local communities. The ExA suggests that the SoS should encourage a proactive, more collaborative approach between Highway Authorities and Developers to consider cumulative effects of traffic on the local network.

- 5.2.93. The ExA concludes that traffic and transport effects have medium weight against the making of the Order.

5.3. LANDSCAPE AND VISUAL EFFECTS

Background and policy context

Introduction

- 5.3.1. Landscape and visual effects were identified as a principal issue in the ExA's initial assessment [PD-006].
- 5.3.2. This section reports on:
- a. landscape and visual effects;
 - b. alternatives as they are relevant to landscape and visual effects as set out in the National Policy Statements (NPSs);
 - c. good design; and
 - d. open space and green infrastructure.

National Policy Statements: Landscape and Visual Effects, including Alternatives

- 5.3.3. The overarching NPS for Energy EN-1(NPS EN-1) requires an applicant to carry out a landscape and visual assessment for construction and operation stages of the proposed development and report it in the Environmental Statement (ES) (NPS EN-1, para 5.9.5 to 5.9.7). The assessment should refer to landscape character assessment studies and include the visibility and conspicuousness of the project during construction and operation and potential impacts on views and visual amenity including light pollution effects. Applicants are encouraged to provide examples of existing permitted infrastructure which has a similar magnitude of effect on sensitive receptors (NPS EN-1, para 5.9.19).
- 5.3.4. Renewable Energy Infrastructure NPS EN-3 (NPS EN-3) requires that an applicant should assess the effects of the cable, where a precise route is proposed, as part of the grid connection (NPS EN-3, para 2.6.37). It also sets out that the onshore element of the grid connection should be determined in accordance with the Electricity Networks Infrastructure

NPS EN-5 (NPS EN-5). NPS EN-5 sets out specific considerations which apply to electricity networks infrastructure for landscape and visual effects (NPS EN-5, Section 2.8).

5.3.5. In reaching a decision on the weight to give landscape and visual impact, the SoS needs to judge whether:

- a. the project has been designed carefully to minimise harm to the landscape; having regard to siting, operational and other relevant constraints, providing reasonable mitigation where possible (NPS EN-1, para 5.9.8 and 5.9.17);
- b. any adverse impact on the landscape would be so damaging as not to be offset by the benefits, including the need (NPS EN-1, para 5.9.15);
- c. any adverse impact is temporary and will be capable of being reversed in a reasonable timescale (NPS EN-1, para 5.9.16);
- d. visual effects on sensitive receptors such as local residents outweigh the benefits of the project (NPS EN-1, para 5.9.18);
- e. reducing the scale of the project to mitigate visual and/or landscape effects outweighs marginal loss of function (NPS EN-1, para 5.9.21);
- f. adverse landscape and visual effects would be minimised through appropriate siting and through design including materials, colour (which should always be given careful consideration) and landscape schemes (NPS EN-1, para 5.9.22); and
- g. off-site planting would mitigate the impact when viewed from more distant vista (NPS EN-1, para 5.9.23).

5.3.6. In terms of alternatives, any which are not among the main alternatives studied in the ES should only be considered if they are believed to be important and relevant to the decision. There is no general policy requirement to consider alternatives or to establish whether the project represents the best option, but landscape and visual effects do require consideration (NPS EN-1, para 4.4.1 to 4.4.3).

5.3.7. Guiding principles to be followed when the SoS is considering alternatives are set out in NPS EN-1. They include:

- a. whether there is a realistic prospect of the alternative delivering the same infrastructure capacity in the same timescale;
- b. that the onus is on the persons putting forward the alternative to provide evidence for its suitability;
- c. that vague or inchoate alternative proposals can be excluded on the grounds that they are not important and relevant to the decision, as can those which are not commercially viable or proposed for sites that are not physically suitable;
- d. that one site should not be rejected because fewer adverse impacts would result on another suitable site;
- e. that alternative proposals should be identified before an application is made wherever possible; and
- f. that consideration of alternatives should be carried out in a proportionate manner (NPS EN-1, para 4.4.3).

National Policy Statements: Good Design

- 5.3.8. The criteria for good design in energy infrastructure are set out in NPS EN-1, Section 4.5. Applicants are required to demonstrate the evolution of the proposed design, and where options were considered, to set out reasons for that selected (NPS EN-1, para 4.5.4). Applicants are encouraged to take independent professional advice on design aspects (NPS EN-1, para 4.5.5).
- 5.3.9. In reaching a decision the SoS should be satisfied that:
- a. both function (including fitness for purpose and sustainability) and aesthetics have been taken into account as far as possible (NPS EN-1, para 4.5.3);
 - b. developments are sustainable (sensitive to place, efficient in use of natural resources in construction and operation, matched by good aesthetics as far as possible) and, having regard to other constraints, are as attractive, durable and adaptable as possible (NPS EN-1, para 4.5.1 and 4.5.3);
 - c. opportunities to demonstrate good design in terms of siting relative to existing landscape character, landform and vegetation have been taken (NPS EN-1, para 4.5.3); and
 - d. the design and sensitive use of materials in e.g. electricity substations which will assist in ensuring that such development contributes to the quality of the area has been considered (NPS EN-1, para 4.5.3).
- 5.3.10. Applicants are expected to demonstrate how siting and the use of appropriate technologies have been used to mitigate adverse effects and thereby contribute to good design (NPS EN-1, para 4.5.2 and 4.5.5).

National Policy Statements: Open Space and Green Infrastructure

- 5.3.11. NPS EN-1 identifies land use, including open space and green infrastructure, as a topic that should be considered in an applicant's assessment of any energy nationally significant infrastructure project (NSIP) (NPS EN-1, Section 5.10). It is noted that green infrastructure also plays an increasingly important role in mitigating or adapting to the impacts of climate change.
- 5.3.12. Applicants are to consider providing new or additional open space including green infrastructure to substitute for any losses resulting from their proposals (NPS EN-1, para 5.10.6).
- 5.3.13. In reaching a decision in terms of green infrastructure, the SoS should consider:
- imposing requirements to ensure the connectivity of the green infrastructure network is maintained (NPS EN-1, para 5.10.20); and
 - whether mitigation of adverse effects is adequately provided for by means of planning obligations e.g. for appropriate management and maintenance agreements (NPS EN-1, para 5.10.21).

Other Legislation, Policies and Guidance

- 5.3.14. The Applicant's Planning Statement sets out the national, regional and local planning policies that are considered relevant [APP-693]. The legislation and guidance relevant to landscape and visual effects is set out in the ES [APP-242, Section 29.2]. Also of relevance to landscape effects and green infrastructure, which both cover biodiversity, are some elements of the legislation cited in the Applicant's assessment of effects on Onshore Ecology [APP-235, Section 22.2].

The National Planning Policy Framework

- 5.3.15. The National Planning Policy Framework (NPPF) establishes that the planning system should contribute to conserving and enhancing the natural and local environment, including landscapes and green infrastructure. It states that development should be sympathetic to local character and history and that a strategic approach should be taken to maintaining and enhancing networks of habitats and green infrastructure. Section 12 of the NPPF sets out that achieving good design is a key aspect of sustainable development.
- 5.3.16. Referring specifically to helping the increased use and supply of renewable and low carbon energy and heat, the NPPF states that positive strategies for energy from these sources must ensure that adverse impacts such as cumulative landscape and visual impacts are addressed satisfactorily.

The application

Environmental Statement

- 5.3.17. The Applicant's ES contains an assessment of landscape and visual effects for construction, operational and decommissioning stages in Chapter 29 [APP-242]. It is supported by relevant figures [APP-484] to [APP-501] and visualisations for 12 viewpoints [APP-509] to [APP-532] for Scenarios 1 and 2. Cumulative landscape and visual effects are covered in the onshore cumulative effects Chapter 33 [APP-246] and [APP-502]. Vegetation removal and indicative planting mitigation for both scenarios are illustrated for the proposed substations [APP-503] to [APP-508].
- 5.3.18. The application includes a Schedule of Mitigation [APP-688], which was updated during the Examination [REP10-008]. In tabular form, this provides links from the predicted construction, operational and decommissioning impacts assessed in the ES to the mitigation proposed and the means of securing the mitigation, such as via a DCO requirement. Landscape and visual is covered in Section 29 of the Schedule of Mitigation, with biodiversity effects, including hedgerows, in Section 23.
- 5.3.19. The onshore embedded project mitigation is reported in Section 5.1 of this Recommendation Report. The embedded mitigation measures with specific regard to adverse landscape and visual effects which would arise have been incorporated as part of the iterative design process [APP-242, Table 29.7]. These are:

- a. no overhead lines;
- b. commitment to HVDC technology;
- c. strategic landscape mitigation (contributing to the wider landscape structure of the area/ helping consolidate green corridors for wildlife);
- d. landfall site selection;
- e. onshore cable route site selection;
- f. onshore project substation site selection;
- g. National Grid substation extension site selection;
- h. hedgerow crossings; and
- i. lighting.

- 5.3.20. The application includes an Outline Code of Construction Practice (OCoCP) [APP-692], which was updated during the Examination [REP14-012]. The OCoCP is a certified plan forming the basis for the Code of Construction Practice (CoCP) which would set out the management measures that would be adopted and implemented for any onshore construction works. It would provide a key mechanism through which environmental impacts associated with the construction of the onshore infrastructure would be formally controlled and mitigated.
- 5.3.21. An Outline Landscape and Ecological Management Strategy (OLEMS) [APP-698] was submitted and updated during the Examination [REP14-020]. It is a certified plan forming the basis for more detailed plans (Landscaping Management Scheme (LMS) and Ecological Management Plan (EcoMP)), which would be provided for approval post consent. The OLEMS is based on the landscape and ecological mitigation and enhancement measures deemed necessary from the ES assessment. A diagram showing the relationship of these plans and how they are secured in the dDCO was provided during the Examination [REP18-014, Annex 1- Onshore] (Figure 5.1.1).
- 5.3.22. The application includes a Design and Access Statement (DAS) [APP-694], which was updated a number of times during the Examination [REP14-014] and [REP14-016] to [REP14-019]. It is a certified document which sets out the various principles, concepts and considerations which would be incorporated into the design of the onshore electrical transmission works. It sets out onshore elements of the project and parameters that are secured in the dDCO, together with design and consultation processes. It also describes the site selection process and consideration given to alternatives, which is described in more detail in the Site Selection and Assessment of Alternatives [APP-217], with supporting Appendices [APP-537] to [APP-546] and Figures [APP-248] to [APP-264].

Local Impact Reports

- 5.3.23. Matters raised in the Local Impact Reports (LIR) of the four local planning authorities, which are of relevance to landscape and visual, alternatives, design, open space and green infrastructure matters are précised here. The proposed cable corridor would pass through all three Districts and the landfall would be located in North Norfolk District. All parts of the Proposed Development would fall in the County of Norfolk.

5.3.24. The onshore substations would be located in the District of Breckland. Extracts from application documents are provided here (Figures 5.3.1 and 5.3.2) to illustrate the overall relationship on the land for the proposed onshore project substation and the extension to the National Grid substation for each scenario. For Scenario 1 the National Grid substation (which sits north of the Dudgeon substation) would be extended to the south east. For Scenario 2, the extension would be to the north west. The onshore project substation would be located further east in Scenario 1, to accommodate the onshore project substation for Norfolk Vanguard OWF.

Figure 5.3.1: Scenario 1 existing and proposed substations. Image extract from [APP-269]

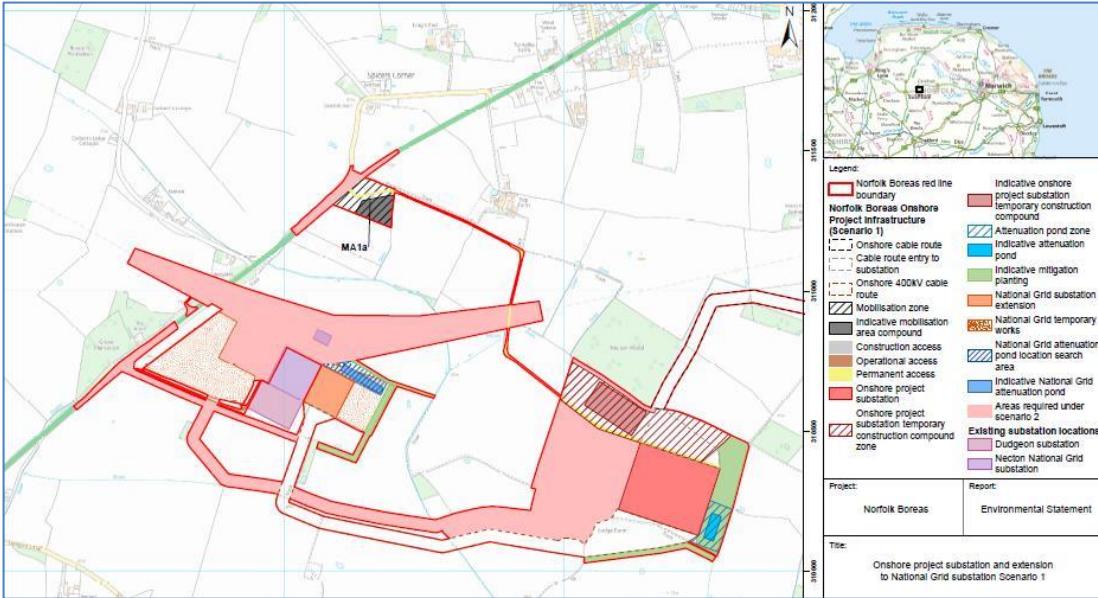
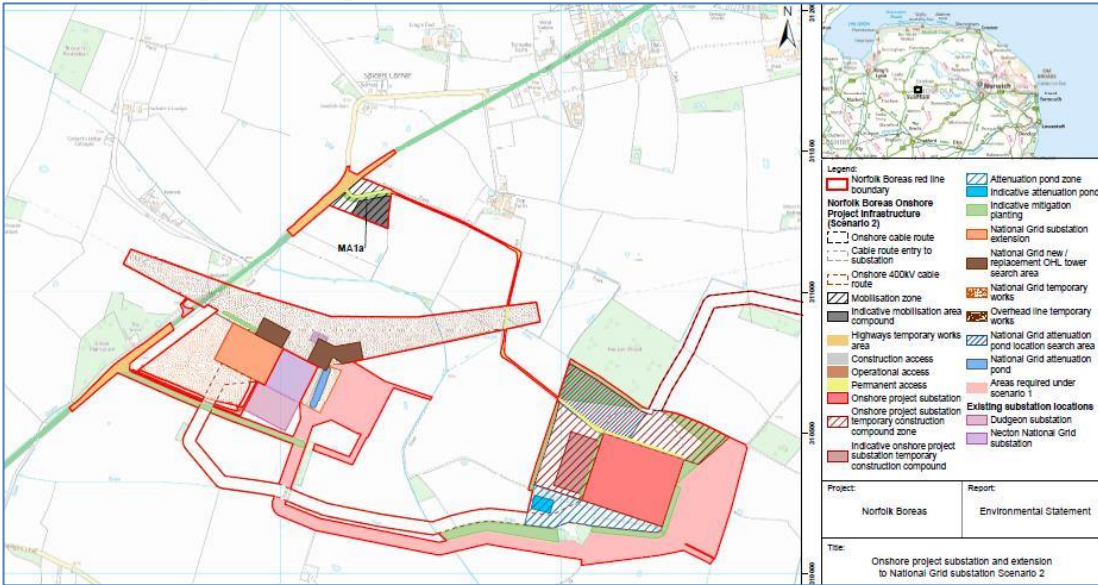


Figure 5.3.2: Scenario 2 existing and proposed substations. Image extract from [APP-270]



Breckland Council's LIR

- 5.3.25. Breckland Council's LIR notes that the key inshore infrastructure in particular the proposed project substation and the National Grid substation extension would have a major impact on the visual appearance of the landscape and the countryside, whether developed independently or in combination with Norfolk Vanguard OWF [REP2-062].
- 5.3.26. Breckland Council calls for cumulative landscape effects to be considered separately from cumulative visual effects, setting out the reasons for this and referring to the possibility of cumulative effects of the substations of this Proposed Development, with those of the existing substations and with those associated with the Norfolk Vanguard OWF.
- 5.3.27. Breckland Council draws attention to the design policy in the new Local Plan (adopted during the Examination on 28 November 2019) and to the policy which is specific to renewable energy infrastructure. In terms of the proposed substations the principle of applying some flexibility for the evolving design and using a project design envelope approach based on worst case scenarios is accepted. But it is stated that due regard needs to be given to the distinctive qualities of the proposed structures in terms of detailing, quality of materials and relation to surroundings.
- 5.3.28. Breckland Council states that it is important that the planning concerns of local communities are properly heard in matters that directly affect them and that the Council would expect different options to be presented to third parties for feedback and to involve the community and key stakeholders on these matters. Breckland Council requests this process be included in an updated DAS.
- 5.3.29. Breckland Council acknowledges and supports the Applicant's approach in response to an action point from the first DCO ISH to prepare a Design Guide for future approvals of the exact details of the layout, scale and external appearance of the proposed onshore substation.

Broadland District Council's LIR

- 5.3.30. Broadland District Council (Broadland DC) sets the relevant policy context and lists ES matters on which it has focussed [REP2-065]. The Council raises some outstanding material impacts over which it has unresolved concerns:
- assessment of hedgerow removal to be undertaken using criteria under the 1997 Hedgerow Regulations, and that replacement planting on adjacent land may be required for mitigation; and
 - the need to assess the visual, public amenity and environmental impacts of the area north of Reepham, where the proposed cable corridor would cross that of Hornsea Project Three OWF (if consented).

North Norfolk District Council's LIR

- 5.3.31. North Norfolk District Council (NNDC) welcomes the Applicant's decision to commit to the use of HVDC transmission for the proposed

development both from the energy efficiency point of view and because of reduced onshore impacts [REP2-087, Section 4].

5.3.32. NNDC considers that there would be some residual adverse landscape and visual effects after the construction phase associated with tree and hedgerow removal and sets out some specific points regarding landscape and visual effects [REP2-087, Section 13].

5.3.33. NNDC calls for:

- a ten-year replacement planting period (rather than five) in its District based on evidence presented in Appendices concerning the free draining, slightly acid, loamy soils, with low fertility;
- replacement tree planting to be implemented in the NNDC area rather than elsewhere along the cable corridor or at Necton; and
- a trenchless crossing at Church Road, Colby, north of Bannington to avoid mature tree loss [REP2-087, Section 13].

Issues: Alternatives

5.3.34. This section reports issues raised during the Examination in relation to the policy requirement to consider alternatives from a landscape and visual point of view, after the strategic decision on the proposed National Grid connection location was taken. Matters regarding alternatives for the National Grid connection location are reported in Section 5.15 of this Recommendation Report. The process, including all stages of site selection, is shown on a flow chart in the DAS [REP14-014, Plate 1] and ES [APP-217, Plate 4.1].

5.3.35. Issues covered below in more detail are those proposed for:

- a. early strategic project alternatives;
- b. landfall location;
- c. onshore cable corridor routeing;
- d. HVAC or HVDC and the need for cable relay stations (CRS);
- e. onshore project substation location; and
- f. National Grid substation extension and overhead line modifications.

5.3.36. In response to WQ1 the Applicant set out the legal and policy position to cover the consideration given to alternatives in the ES and other application reports [REP2-021, Q9.2.2]. The Applicant also responded to points made in RRs regarding alternatives, setting out relevant ES and Consultation documents [AS-024, Table 1, No.2 and No. 3].

Early strategic project alternatives

5.3.37. As part of the iterative design process, the Applicant reported that it considered and made decisions on several early strategic project alternatives, which form some of the project embedded mitigation measures [APP-217, Table 4.2]. The project embedded mitigation is reported in Section 5.1 of this Recommendation Report.

- 5.3.38. The ExA is satisfied with the approach taken by the Applicant regarding the project embedded mitigation.

Landfall location

- 5.3.39. The proposed landfall location at Happisburgh South would be a joint one with that for Norfolk Vanguard OWF. The Applicant's Site Selection and Assessment of Alternatives describes how the potential offshore cable corridor and landfall options were ranked. Areas sufficient for both the Proposed Development and Norfolk Vanguard OWF to be developed were assessed and ranked based on offshore criteria and onshore cable routeing constraints [APP-217, Section 4.7].
- 5.3.40. When the grid connection at Necton was confirmed, the offshore cable corridor was refined. Three landfall locations were considered and Happisburgh South was selected as the preferred location based on environmental, heritage, technical and social criteria [APP-217, Section 4.8 and 4.9]. This is also reported in Section 5.10 of this Recommendation Report.
- 5.3.41. Two IPs suggested that better landfall options were available [RR-053], [RR-036]. The Applicant responded explaining that the choice of landfall location was a key part of the consideration of offshore and onshore cable route selection which would minimise environmental impacts [AS-024, Table 1, No.2].
- 5.3.42. The ExA is content with the Applicant's explanation for the selection of the landfall location and finds the supporting information robust and the case for combining cable corridor and therefore landfall in the case of Scenario 1 to be persuasive.

Onshore cable corridor routeing

- 5.3.43. The cable corridor routeing in the dDCO for the Proposed Development would be the same as the cable route defined in the made Order for Norfolk Vanguard OWF. This is one of the elements of the Applicant's early strategic approach and formed part of the embedded project mitigation, which enabled a reduction in corridor width because of the Norfolk Vanguard OWF decision to adopt HVDC technology. Options were narrowed down to the preferred routeing [APP-217, Section 4.10 to 4.11].
- 5.3.44. The option to shorten the corridor routeing by using a different substation for connection was questioned [RR-109]. The Applicant explained that the Necton routeing had less adverse environmental effects [REP2-021, Q9.2.6]. This was also mentioned in a series of questions sent to BEIS by an IP in connection with the Norfolk Vanguard OWF and copied to this Examination [REP17-016, Q1].
- 5.3.45. The ExA is content with the case made by the Applicant for adopting the same cable corridor routeing as that for Norfolk Vanguard OWF for Scenario 1 and that it is an appropriate routeing for Scenario 2.

HVAC or HVDC and the need for cable relay stations

- 5.3.46. The decision to propose HVDC technology for the electrical transmission system is intrinsically linked with that made for the Norfolk Vanguard OWF application because of the strategic approach for the two projects, which would combine duct installation that is suitable only for HVDC. The benefits of HVDC technology are set out including no requirement for cable relay stations (CRS) and other environmental benefits [APP-217, Table 4.2]. It would require up to two HVDC converter stations to convert HVDC to HVAC power for connection to National Grid.
- 5.3.47. Concerns were raised by IPs such as the MP for Mid Norfolk [RR-042], the MP for North Norfolk [AS-012] and CPRE Norfolk [RR-046] that HVDC was not secured. This point was also made at the Open Floor Hearing (OFH) in Norwich on 13 November 2019 (OFH1) [EV4-001]. On this point, the Applicant confirmed in its response to RRs that the terms of the dDCO would only allow HVDC export infrastructure and that an HVAC export system could not be constructed [AS-024, Table 26, No. 84].
- 5.3.48. During the Examination, IPs local to Necton raised concerns about the increased dimensions of the project substation arising from HVDC technology's need for converter halls. These included the MP for Mid Norfolk [RR-042], Necton Parish Council (Necton PC) ⁵ [REP2-083] and Necton Substation Action Group (NSAG) ⁶ [REP3-025].
- 5.3.49. In response the Applicant confirmed that the worst case increase in height between the two transmission systems at the onshore project substation would be 14.9m [REP5-045, Q2.9.2.1]. There was a view from some IPs that the full extent of the differences had not been explained at consultation events [REP7-054, Q2.9.2.1], [REP8-030] and [REP10-072].
- 5.3.50. As more points arose from IPs regarding the choice of HVDC, in response to WQ4, the Applicant explained that there would be wider-reaching benefits of HVDC technology other than the type of infrastructure for the onshore project substation including: energy efficiency, fewer cables, no CRSs, fewer jointing pits and speedier duct installation and cable pulling [REP10-034, Q4.9.2.1].
- 5.3.51. The ExA agrees with the reasons that the Applicant set out for the choice of HVDC transmission technology and the benefits (construction and operation) that would arise from aligning with the cable corridor routeing and HVDC transmission technology proposed for Norfolk Vanguard OWF as an early strategic project alternative.
- 5.3.52. The ExA notes that the Applicant makes limited reference to what could be seen as a disbenefit of HVDC, namely the need for larger structures at the Necton onshore project substation, in its Site Selection and Assessment of Alternatives, which only mentions the environmental

⁵ The parish in which the proposed substations would be located.

⁶ NSAG is a local action group with a membership of 250, set up initially to respond to the Dudgeon substation proposals [EV13-011].

benefits of proposing HVDC over HVAC [APP-217]. The ExA is not convinced that there was an adequate understanding by all those representing the residents of Necton of the difference that there would be in dimensions of the proposed onshore substation between HVAC and HVDC technologies.

- 5.3.53. The ExA acknowledges that there are differences between the two technologies both along the cable corridor and at the project substation site. From the evidence presented it is clear that the infrastructure associated with HVDC would result in benefits at some locations and adverse effects at others. The question of whether one technology represents the best option is not a matter for consideration by the ExA (NPS EN-1, para 4.4.1 to 4.4.3). The ExA is satisfied that the Applicant has assessed the two alternative technologies appropriately.

The proposed onshore project substation location

- 5.3.54. The rationale for the location of the proposed onshore project substations (Scenarios 1 and 2 have proposed project substations located on different sites – see Figures 5.3.1 and 5.3.1 below) are set out in the Site Selection and Assessment of Alternatives and supporting Appendices [APP-217], [APP-545] and [APP-546]. The preferred sites were selected after an optioneering process, which took into consideration a range of specified constraints, using the Horlock Rules⁷.
- 5.3.55. For the duration of the Examination, the choice of site for the onshore project substation has been challenged by many IPs, including Necton PC, NSAG, the NFU/LIG, other landowners, residents of Necton and Ivy Todd and the MP for Mid Norfolk. The key arguments are as follows:
- a. the proposed site is on a watershed, the highpoint of the local area, therefore highly visible;
 - b. the siting has not taken account of the Horlock Rules;
 - c. the selection process was flawed;
 - d. there is a better, alternative site at Top Farm; and
 - e. consultation regarding the location of the proposed onshore project substation has not been thorough enough.
- 5.3.56. To illustrate this, extracts from plans submitted are included. These show the locations of the proposed onshore project substation (for each scenario), Top Farm, 5m interval contours and the A47, for Scenario 2 (Figure 5.3.4) and including the location Norfolk Vanguard OWF would occupy for Scenario 1 (Figure 5.3.3) [REP7-019, Appendix 9.1].
- 5.3.57. The rationale for locating the proposed onshore project substation for either scenario on a local highpoint, resulting in high visibility that would result and the difficulty of effective screening, was challenged: in writing [REP2-083], [REP3-025], [REP4-028], at ISHs [EV3-003] to [EV3-004], [EV6-002] to [EV6-005], [REP4-029] and at OFH1 [EV4-001], [REP1-048] and OFH3 (Necton session) [EV13-011], [REP13-050]. This is linked

⁷ National Grid (undated) Guidelines on Substation Siting and Design (The Horlock Rules)

to suggestions that the Horlock Rules have not been addressed [REP1-069], [REP15-015] and [REP16-020].

- 5.3.58. Linked to the argument about the elevated position of the proposed project substation, many IPs have also urged the Applicant to locate the proposed substation at the alternative site of Top Farm. They question why this site, which they consider to be better, was not proposed. Continued reference to this alternative site was made by IPs, including landowners throughout the Examination in written representations and at hearings. One landowner called the site selection process flawed considering Top Farm a better site, [REP14-075] a point also made by the NFU/LIG [REP10-062, Q4.9.2.3].

Figure 5.3.3: Norfolk Boreas proposed onshore substation location. Image extract from [REP7-019, Appendix 9.1, Fig 1d: Scenario 1]

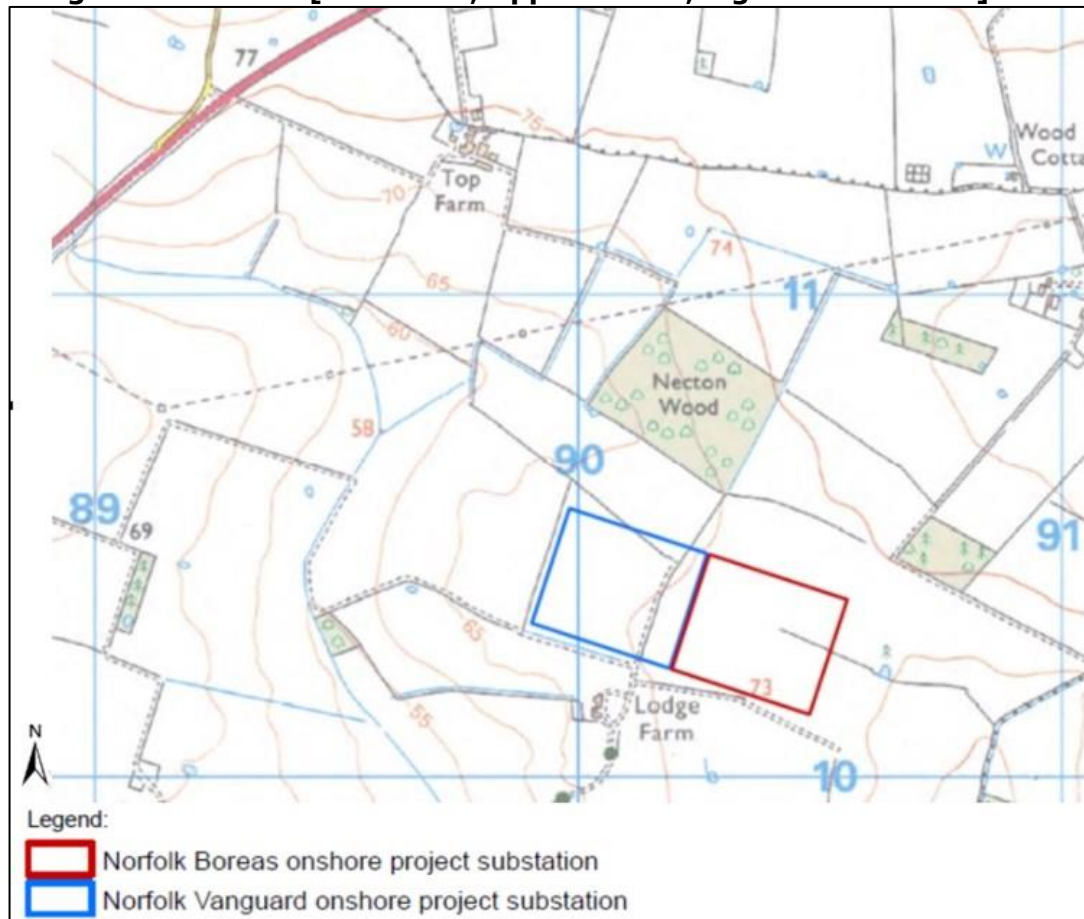
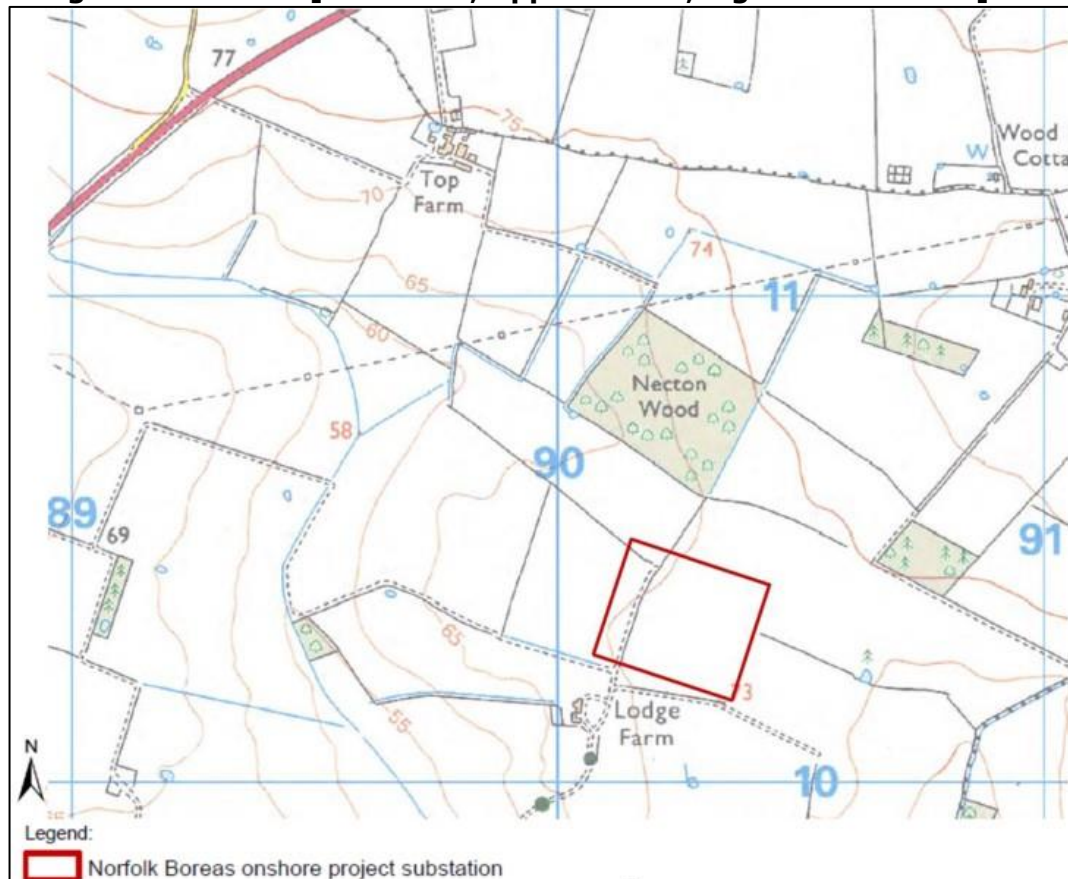


Figure 5.3.4: Norfolk Boreas proposed onshore substation location.
Image extract from [REP7-019, Appendix 9.1, Fig 2d: Scenario 2]



- 5.3.59. The ExA was invited to view the proposed onshore substation site and Top Farm on an ASI, which was undertaken on 23 January 2020 [EV8-002]. The day before the ASI, at the ISH for Onshore Effects (ISH3) [EV6-001] to [EV6-005], Necton PC presented a physical, scale (unverified) model of the geographic area covered by the plan inserts above in Figures 5.3.3 and 5.3.4, which had moveable parts representing features of the landscape and of the Proposed Development [REP4-029]. Photographs of the model were provided [REP4-029]. Features were added to the model as the description was read out, and Proposed Development objects moved to demonstrate how it could be accommodated on the Top Farm site. The points being made were:
- a. the scale of the overall Proposed Development;
 - b. the converter halls would be very visible because they would be on high ground;
 - c. Top Farm would be less obtrusive; and
 - d. high bunding with planting would achieve better screening than that proposed.
- 5.3.60. The ExA found the explanation and the model extremely helpful in providing an overview of the area, to gain a sense of overall scale and as preparation for what would be pointed out during the ASI the next day.

Figure 5.3.5: Photograph of Necton PC's model. Image extract from [REP4-029]



- 5.3.61. The Applicant has responded to all representations and has consistently explained:
- a. the advantages of the proposed location for the onshore project substation and the process for selecting it;
 - b. the disadvantages of Top Farm as an alternative location; and
 - c. the legal position regarding alternatives.
- 5.3.62. The Applicant's case for locating the onshore project substation on the proposed site is that it would:
- a. be located outside the residential buffer zone and sufficiently far away from residential receptors to limit impacts, primarily noise;
 - b. be sited to utilise topography and screening by existing vegetation;
 - c. be located on relatively flat land which would minimise earthworks;
 - d. meet the Horlock Rules in terms of siting, using landform; and
 - e. be capable of mitigation for adverse landscape and visual effects by planting [REP1-036], [REP2-021, Q9.2.7, Q9.2.8].
- 5.3.63. The arguments the Applicant set out against the Top Farm site being suitable are that it would:
- a. be closer to residential receptors, some in the residential buffer zone;
 - b. be much closer to principal visual receptors including the heavily trafficked A47 and Little Fransham village;
 - c. require significant earthworks to level the site, which would require lengthier pre-construction and construction periods;
 - d. be constrained technically because of the overhead lines;
 - e. be more exposed in the local landscape site; and

- f. have no natural tree cover in this area [REP1-036], [REP2-021, response to Q9.2.7 and Q9.2.8] and [REP7-017, response to Q3.9.2.1].

- 5.3.64. The Applicant also summarised the legal requirement for consideration of alternatives, the relevant EIA Regulations and the NPS guidance on alternatives setting out how these are addressed in the application. The Applicant referred to the guiding principles that the SoS should use when deciding what weight to give to alternatives (NPS EN-1, para 4.4.3). In considering Top Farm within the terms set out in NPS EN-1, the Applicant considered that submissions on Top Farm do not meet the test because they are vague and inchoate, not identified in any detail sufficient to allow appropriate consultation and development of a suitable evidence base, nor with evidence for suitability [REP2-021, response to Q9.2.2].
- 5.3.65. The ExA agrees with the Applicant's reasoning regarding the guiding principles for considering alternatives set out in NPS EN-1, para 4.4.3. Whilst there have been numerous, consistent suggestions that Top Farm would be a better site with a willing landowner, the ExA concludes it can be excluded because it does not meet the tests in NPS EN-1, para 4.4.3.
- 5.3.66. However, the ExA did examine the process, the LVIA and the proposed substation site in terms of topography in order to reach that view. Whilst the ExA agrees with the overall conclusion, there are aspects of the Applicant's case with which the ExA disagrees such as the emphasis the Applicant gave to adverse effects on views for motorists from the A47. This is covered in more detail below under the sub-section on Landscape and Visual Effects.
- 5.3.67. Regarding the Horlock Rules, the ExA is content that the Rules were taken into consideration at the substation siting stage and that it would be appropriate to include mechanisms for post-consent discharge of requirements to be assessed against the content of the guidelines contained within the Rules. This is reported further below under Good Design.

National Grid substation extension and overhead line modification

- 5.3.68. Necton PC and NSAG cited a preference for T-pylons rather than lattice pylons for the new and relocated pylons in Scenario 2 [REP5-063, Q2.5.2.2], [REP5-085, Q2.5.2.2]. The Applicant responded that the new pylon would need to be compatible with the existing overhead line (OHL) and that the detail would be determined post consent as part of detailed design [REP6-014, Q2.5.2.2].
- 5.3.69. The ExA is strongly of the view that a different pylon design for the two new pylons would not be appropriate in this location, where the rest of the OHL is supported by lattice pylons.

ExA's conclusions on alternatives

- 5.3.70. For the reasons stated above under each of the matters relating to alternatives the ExA is satisfied that the Applicant was diligent in its consideration of alternatives and has met the NPS tests (NPS-EN-1, para

4.4.2 to 4.4.3). The ExA acknowledges that IPs, particularly in the Necton area, have opinions on what they consider a better site and on the advantages of another transmission technology. However, the ExA has had regard to policy guidance which does not require the presence of a site with fewer adverse impacts to be a reason for refusal, that physical suitability would need to be demonstrated and that alternatives of any kind would require more detail than those making the case have provided. Notwithstanding this, the ExA is grateful to the IPs in Necton who have provided local knowledge and pointed out details about the area. This has informed the ExA and led to further examination of the role of the local community in post-consent submissions, should the Proposed Development be consented.

Issues: Landscape and Visual Effects

- 5.3.71. The Applicant's landscape and visual impact assessment (LVIA) adopts terminology whereby the nature of the effects is only stated if it is neutral or beneficial, because landscape and visual effects would be likely to be adverse [APP-242, para 33]. The ExA has not adopted this approach in this Recommendation Report, because it considers it is clearer to state the nature of effects (adverse, neutral or beneficial).
- 5.3.72. There were four matters which appeared as issues at the outset, but which were resolved during the Examination. These are covered briefly below and are:
- a. cumulative adverse landscape and visual effects at the cable corridor crossing point with the Proposed Hornsea Project Three OWF at Reepham;
 - b. hedgerows;
 - c. trenched or trenchless crossing at Church Lane, Colby; and
 - d. management and maintenance – locations of and timescales for replacement planting in NNDC.

Cumulative adverse landscape and visual effects at the proposed cable crossing point north of Reepham

- 5.3.73. Broadland DC sought clarification over what the effects on visual and public amenity would be at the proposed crossing point of cable corridors with Hornsea Project Three OWF [REP2-047, Table 7]. The Applicant provided plans and reassurances that there would be no residual impact because land and hedgerows would be reinstated, so the effect would be short and reversible. The Applicant explained that the only significant, adverse cumulative effect would occur on views for footpath walkers on approximately 200m of the long-distance footpath, Marriott's Way and this would be limited in duration [REP3-010, point 5.11], [REP2-021, Q4.1.1] and [REP2-023, Appendix 4.3, Figures 1a and 1b].
- 5.3.74. In the final SoCG with Broadland DC the matter was agreed [REP10-036, Table 7]. The ExA is satisfied that the cumulative adverse landscape and visual effects would be no more than that assessed, and that reinstatement would mean these adverse effects would be short term and reversible. The ExA notes that during construction Reepham

Footpath FP18 would be subject to closure, controlled crossings and a construction access would require management when in use [APP-012, Map 21], [APP-535, Map 5] and [APP-679, Table 1.1].

Hedgerows

- 5.3.75. Hedgerows form part of the Applicant's assessments in LVIA, terrestrial ecology, heritage (in terms of Important hedgerows as defined in the Hedgerow Regulations 1997) and are relevant for green infrastructure (NPS EN-1, Section 5.10). The findings of the LVIA conclude that the adverse effects on hedgerows and hedgerow trees would not be significant for either scenario, but that there would be localised significant adverse effects. The ExA visited the majority of the locations where significant adverse landscape effects were predicted to occur on its Unaccompanied Site Inspections (USIs) [EV2-004].
- 5.3.76. In terms of Important and Potentially Important hedgerows (listed in dDCO Schedule 14), the findings show that Scenario 1 would involve removal of a very limited number of Important hedgerows, only in the district of Breckland in the vicinity of the proposed onshore project substation. For Scenario 2, there would be much more extensive removal of Important hedgerows and Potentially Important hedgerows across all three districts.
- 5.3.77. Initially, Broadland DC felt it was not clear whether hedgerows had been assessed in accordance with the Hedgerow Regulations 1997. But later, agreed the hedgerows have been assessed appropriately and that those hedgerows located within the un-surveyed areas of the onshore project area would be surveyed post consent [REP10-036, Table 7, Page 26].
- 5.3.78. The ExA is content that the hedgerows have been assessed in accordance with the appropriate guidance (covering landscape, visual, heritage and terrestrial ecology) and that the Order, through R18, R19 and R24 (which includes the Hedgerow Management Strategy which forms part of the EcoMP), would ensure that necessary hedgerow retention, removal, replacement and maintenance would be adequately secured for both scenarios.
- 5.3.79. Schedule 14 and associated plans were updated for minor inconsistencies at D14 [REP14-006] to [REP14-009] and D18 [REP18-009]. The ExA has made no other changes to this Schedule in the rDCO. Details of mitigation for removal of hedgerows at Paston Great Barn SSSI as it affects Barbastelle bats are given in Section 5.6 and for Paston Great Barn SAC in Chapter 6 of this Recommendation Report.

Open-cut trench or trenchless crossing at Church Road, Colby

- 5.3.80. This matter, which was resolved during the Examination is reported under construction effects in Section 5.4 of this Recommendation Report.

Management and maintenance – locations of and timescales for replacement planting in NNDC

- 5.3.81. At the start of the Examination there were differences of opinion between the Applicant and NNDC over two matters:
- a. the need for a ten-year maintenance period for planting in North Norfolk District; and
 - b. how mitigation planting could be assured to be located as close as practicable to the location from where trees had been removed in North Norfolk District under Scenario 2 [REP2-087], [REP2-052, Table 10].
- 5.3.82. The agreement to the ten-year maintenance period resulted in amendments to the dDCO at Article 27(12)(a) defining the maintenance period for North Norfolk District by reference to R19(2), and amendments to Article 27(12)(b) which clarified a five-year maintenance period for all other areas. There was addition of a new R19(2), to secure a ten-year replacement period for trees, shrubs and hedgerows within North Norfolk District. R19(3) was also amended to clarify that maintenance in all other areas would be five years. This was included in dDCOV6 [REP7-003], in the Applicant's final dDCO [REP18-009] and is covered in the updated SoCG [REP10-040, Table 10]. It is also included in the updated OLEMS, where references which were subject to landowner agreement were removed [REP10-014, para 22, 71 and 76].
- 5.3.83. The matter regarding replacement planting for trees had hinged on how landowner agreement could be secured if replacement planting would need to be outside the Order limits. Agreement between NNDC and the Applicant was reached such that if landowner agreement could not be secured for replacement tree planting as close as practicable to the location from where they would be removed, an alternative scheme or schemes for replacement tree planting would be prepared ensuring no net loss of trees. This is captured in an update to the OLEMS [REP10-014, para 148, bullets 5 and 6], which is secured through R18 of the dDCO and applies to all districts. The ExA welcomes the agreement reached on these two items between the parties. The ExA agrees with the changes contained in the Applicant's final dDCO and has included them in the rDCO.
- 5.3.84. The more substantive issues which arose during the Examination are:
- a. landscape and visual methodology including the visualisations;
 - b. visual impact of proposed onshore substations and bunding;
 - c. consultation and engagement on proposed substations at Necton; and
 - d. post-consent discharge approvals by local planning authorities.

Landscape and visual methodology including the visualisations

- 5.3.85. The ExA sought clarity on a number of matters relating to LVIA methodology which were satisfactorily answered. Matters which were not resolved or answered satisfactorily are reported and the ExA's reasoning is given in each case:
- localised significant effects in landscape and visual methodology;

- significance;
- visual methodology including long distance views, how distance is included in the visual assessments, visual impact assessment process, public and private views and sensitivity of road users on the A47; and
- accuracy of visualisations and use of the Rochdale envelope.

Localised significant adverse effects

- 5.3.86. In a number of locations, the Applicant's LVIA concludes localised significant adverse effects on landscape and visual receptors. Referencing guidance⁸ the Applicant explained that the meaning of a localised effect was intended to show that the adverse effect would be commensurate with the scale of the landscape type in which it occurred [REP2-021, Q9.0.3]. In the assessment the extent of most of the localised significant adverse effects are limited geographically and/or temporally (e.g. for the construction period, or for the period until mitigation planting achieves screening such as 20 years) [APP-242].
- 5.3.87. The ExA finds that the geographic limits of the localised significant adverse effects in many places are well-defined but that the explanation of the process of arriving at them is not. The ExA accepts that professional judgement would be involved. This is one of a number of aspects of the LVIA which led the ExA to push for more detail of future post-consenting processes to be set out, so that it could be more certain that adverse landscape and visual effects would be mitigated.

Significance

- 5.3.88. The ExA notes the explanation that the LVIA methodology differs from that described in the EIA methodology in ES Chapter 6, in that it concludes effects to be "*significant*" or "*not significant*" rather than "*major*", "*moderate*" or "*minor*", which then compute into "*significant in EIA terms*" or "*non-significant in EIA terms*" [APP-219, Table 6.1].
- 5.3.89. The ExA considers that the binary nature of the assessment of significance leads to less nuanced conclusions on significance of effect. Notwithstanding the definitions for significance of impact and the tabular balancing of factors leading to the significance assessment [APP-242, Table 29.3 and Table 29.4], the ExA has had regard to the large number of not significant adverse landscape and visual effects in considering the weight to attribute against the Order being made to these adverse landscape and visual effects.

Visual methodology – study area parameters, distance and public views

- 5.3.90. The ExA was asked by Necton PC and NSAG to view the existing Necton substation from a distance of 5kms at Ashill Common and from other more distant locations. This was because confusion had arisen over whether the visual assessment considered views from public or private

⁸ Landscape Institute and Institute of Environmental Management and Assessment: Guidelines for Landscape and Visual Assessment 3rd edition 2013 (GLVIA 3)

places, and how residential amenity had been assessed. The ExA visited the requested locations which were publicly accessible on its USI on 16 March 2020 and has viewed the sites for the proposed substations from all the ES viewpoints and from other locations [EV2-004].

- 5.3.91. The ExA is satisfied with the Applicant's response on the study area parameters used in the ES for visual impact assessment are suitable and that a robust and clear process was adopted in selecting and agreeing viewpoints. Also, the ExA is satisfied with the method adopted for viewpoints on public locations, representing views from public and private spaces [REP2-021, Q9.1.1].
- 5.3.92. The ExA queried the way that distance was used in the visual assessment. The Applicant confirmed that distance could be a factor in reaching a judgement on two different strands of the assessment process [REP2-021, Q9.1.4] and [REP5-045, Q2.9.1.1]. Whilst the ExA accepts some logic to this position, there is lack of clarity as to when distance has been used in each of the judgements, and the Applicant's response is based on guidance for landscape receptors (not visual).
- 5.3.93. This led the ExA to question further the findings of the assessment of views by motorists on the A47, when compared with those representing views from private residences in Necton. The Applicant used the proximity of the A47 road users (stated as approximately 20,000 vehicles per day passing the viewpoints) in its case against Top Farm as a site for the onshore project substation [REP7-017, Q3.9.1.1 and Q3.9.1.2].
- 5.3.94. The ExA sympathises with the residents' views as reported by NSAG regarding the apparent emphasis the assessment gives to fleeting views of varying degrees, at speed from the A47, when the Proposed Development which would sit in the context of existing similar infrastructure, versus views from people's homes [REP5-088, Page 12]. The ExA considers this is an example of where distance (or proximity) as used in the assessment leads to conclusions which are questionable. This is another reason, in terms of the LVIA findings, why the ExA explored further what mitigation other than planting could be secured to address adverse visual effects.

Visualisations and the Rochdale Envelope

- 5.3.95. There was sustained disagreement throughout the Examination regarding the accuracy of the ES visualisations (specifically Viewpoint 3 (VP3) [APP-511] and [APP-523], and VP7 [APP-515] and [APP-527]). This was mentioned by the MP for Mid Norfolk at the outset [RR-042] and continually queried throughout the Examination by NSAG, a Necton landowner and other IPs.
- 5.3.96. The crux of the argument was over the level of accuracy of the visualisations in illustrating the actual landform; whether the digital terrain model (DTM) could be interpreting vegetation as landform, thus presenting topographical screening that does not exist. This would mean in the figures below that the trees in the centre left of the baseline photograph (top part of figure) might have been interpreted by the DTM

model as landform rather than vegetation, in the model view (bottom part of figure below). The modelled landform would therefore be higher than the actual ground level, and would provide less landform screening than shown, so more of the substation would be visible.

- 5.3.97. This was particularly the case for VP3, extracts of which, taken from the Applicant's ES, are provided below.

Figure 5.3.6: Extract from ES, Scenario 1 VP3, Figure 29.25b (2 of 2) - View from Lodge Lane North towards proposed onshore project substation and that proposed for Norfolk Vanguard OWF. Image extract from [APP-511]



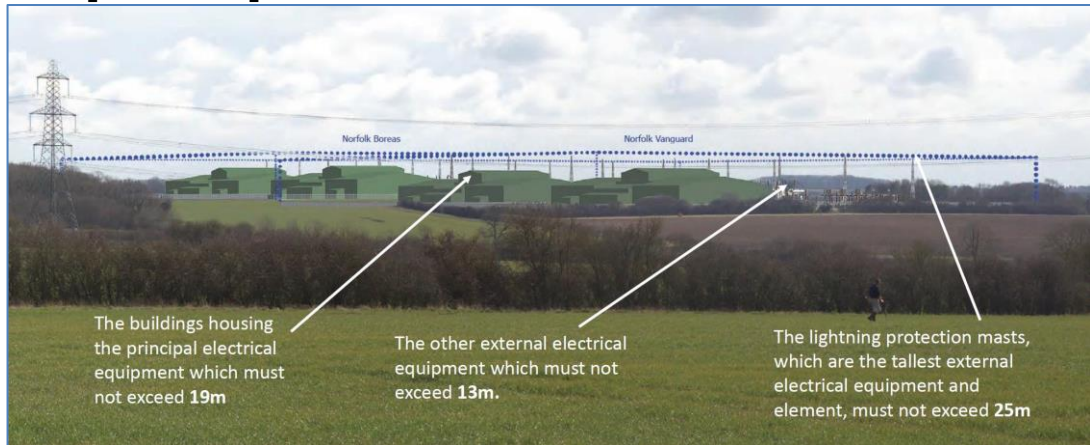
Figure 5.3.7: Extract from ES, Scenario 2 VP3, Figure 29.37b (2 of 2) - View from Lodge Lane North towards proposed onshore project substation. Image extract from [APP-523]



- 5.3.98. The Applicant responded to points raised by the IPs and at the ExA's request provided relevant cross sections. The Applicant explained that there can be subtle differences between modelled landform and actual landform and conceded that the potential VP3 anomaly in the DTM could be a result of the ground DTM having incorporated some surface features (the ExA presumes this to include the trees) by mistake and that there may be a degree of discrepancy in respect of the DTM data for VP3 [AS-024, Table 24, No.4], [REP5-045, Q2.9.1.3] and [REP11-008, Section 1.9].
- 5.3.99. The Applicant explained that visualisations are used to illustrate scale and extent, not detailed design. The Applicant also stated that the visualisations show the blue dotted line for the Rochdale Envelope which "may overestimate the extents to which the development could be visible" and the substation model alone which "may underestimate

visibility” [REP5-045, Q2.9.1.3]. By the substation model, the Applicant means the digital model used to generate the green converter hall buildings on the visualisations, as illustrated in the slides shown at ISH2 provided below as Figure 5.3.8 [REP4-013, Appendix 2].

Figure 5.3.8: Annotated zoomed in extract from ES VP5, Scenario 1, showing height limitations for proposed substations. Image extract from [REP4-013]



- 5.3.100. The Applicant confirmed that the blue dotted lines of the Rochdale Envelope cover the potential extent of the footprint of buildings and that the 25m height represents the upper limit for the lightning masts, whilst the converter halls (buildings housing the electrical equipment) would be limited to 19m i.e. 6m below the blue dotted line. Later the Applicant explained that the Rochdale Envelope was then an overestimate because of the commitment made in the DAS through the Zoning Plans to locate the converter halls in the north part of the site, farthest away from sensitive receptors [REP17-003, point 1.2].
- 5.3.101. There was a difference of opinion as to whether the visualisations do represent the worst case because the buildings could occupy more area covered by the blue dotted lines [REP14-078]. The accuracy of the visualisations was still being raised by IPs at the end of the Examination [REP16-018] and [REP17-016]. The Applicant disagreed, stating that the visualisations represent the worst case [REP17-003, point 1.2].
- 5.3.102. It is clear from the thorough representations from Necton IPs on this matter that there is detailed, intricate knowledge about the local landform. This was also evident on the ASI, when points of interest in the local topography were pointed out to the ExA [EV8-002].
- 5.3.103. However, the ExA agrees with the Applicant’s explanation of the purpose of the ES visualisations and the degree of variance that can be envisaged through their use for this purpose. The ExA does not agree that the visualisations represent the worst case. This is especially the case for Scenario 1, where there would be no control in the Order over matching or complementing massing, height, materials and colour of the Proposed Development converter halls with those of the converter halls for the Norfolk Vanguard OWF, all of which are matters which should be given careful consideration as set out in NPS EN-1, para 5.9.22.

- 5.3.104. The ExA welcomes the constraints imposed by the inclusion of the Zoning Plans in the DAS. The ExA acknowledges the need for some flexibility because the layout, height and finishes of the onshore project substation would not be as they have been modelled for illustrative purposes. The ExA considered that it was more important during the Examination to secure processes for determining the future detailed design, to ensure post-consent discharge of requirements would meet the criteria for good design than to pin down all the detail at this stage.
- 5.3.105. Through various updates during the Examination the final DAS had a process set out which would require the Applicant to present photomontages (as opposed to visualisations) of the details of the proposed converter halls, which would be used in the field alongside colour test panels with consultees to gather feedback [REP14-014, Appendix 1]. The ExA considers that this would present a more accurate opportunity for engagement on all aspects of mitigation, when final ground levels, buildings' footprints, massing and height, extent of bunding and planting can all be input to the digital model used to generate the photomontages. For that reason, because of the detail that would be delivered for post-consent discharge of requirements through the DAS, secured by R16(4) and the LMS secured by R18(2), the ExA is content that the visualisations presented in the ES are fit for purpose, but that they do not illustrate the worst case.

ExA's conclusions on LVIA methodology

- 5.3.106. The ExA found the methodology adopted by the Applicant in its LVIA somewhat complex. Even with terms explained the process adopted to reach the assessment outcome and significance was not easy to follow [REP7-017, Q3.9.1.2]. Later in the Examination the Applicant noted that "*matters relating to LVIA in particular are often subjective*" [REP11-007, Q4.9.2.3]. The ExA notes that there is agreement from the relevant planning authorities on the methods [REP18-030, Table 3.20]. However, in terms of the findings of the assessment and approach to mitigation Breckland Council and the Applicant agree in their final SoCG that "*other screening and mitigation options will be considered as part of the landscaping process if appropriate.*" [REP9-013, Table 8].
- 5.3.107. The ExA found the Applicant's persistent reliance on an LVIA based on a Rochdale Envelope approach, which concluded residual significant adverse effects for up to 25 years in places as a reason for not needing to consider further mitigation or further aspects of design not to be in line with NPS EN-1. The ExA does not consider that 25 years (when the Proposed Development's design life is 30 years) is a reasonable time scale (NPS EN-1, para 5.9.16) before adverse effects would be capable of being reversed.
- 5.3.108. For the reasons set out above and policy matters relating to Good Design, the ExA explored what further mitigation could be secured to address areas of uncertainty arising from the LVIA. This is covered in the sub-section below on Good Design.

Landscape and visual impact of the proposed substations, including mitigation by level changes and bunding

- 5.3.109. The Applicant's landscape and visual assessment in the ES concludes that all residual adverse landscape and visual effects (for both scenarios alone and cumulatively with other developments), all of which are "*localised effects*" are reversible for construction stage after 30 months (the construction period), reversible after three to five years in the case of hedgerow reinstatement and for the operational stage become not significant adverse effects after ten, 20 or 25 years depending on the location [APP-242, Table 29.21]. Views from two viewpoints (VP2 and VP5) would result in beneficial effects after 20 and ten years respectively.
- 5.3.110. The Applicant set out that adverse effects would be mitigated through the implementation of the OLEMS and its maintenance, secured by R18 and R19. The mitigation would include effective, appropriate and suitable landscape screening and planting [REP14-020, Table 4.2]. Mitigation planting plans are provided for Scenario 1 [APP-492], [APP-494], [APP-495] and for Scenario 2 [APP-503], [APP-505], [APP-507], and [APP-508]. The Applicant did not accept in principle that any further mitigation other than screen planting would be required as evidenced by the final version of the Schedule of Mitigation [REP18-017, Table 22].
- 5.3.111. The Applicant's case was that the final design of the proposed onshore project substation and the National Grid substation extension would be subject to post-consent detail design which would ensure blending with the local environment in accordance with a set of design parameters and a design process in the DAS [AS-024, Table 24, No.5].
- 5.3.112. Throughout the Examination representations from the Necton area, including Necton PC, Holme Hale PC, NSAG and other IPs, including landowners and residents raised concerns about the visual impact of the proposed substations. The main matters of concern were:
- a. size of the proposed substations;
 - b. the effectiveness of bunding and screen planting;
 - c. levels; and
 - d. lighting.

Size of proposed substations

- 5.3.113. The height and size of the converter halls at the proposed onshore project substation is the matter about which most concern was raised. Various IPs provide illustrative visual comparisons of the proposed onshore project substation with items of familiarity, as shown below (Figures 5.3.9 to 5.3.12) including double decker buses [REP1-069], the Angel of the North [REP16-018], Necton Farm Barns in the Ivy Todd locality [REP6-052] and [REP7-066], which the ExA has observed during USIs [EV2-004] and in relation to the existing Dudgeon substations [REP13-055].

Figure 5.3.9: Double decker buses (45 long, 5 high) comparison with proposed onshore substation (scale unverified). Image extract from [REP1-069]

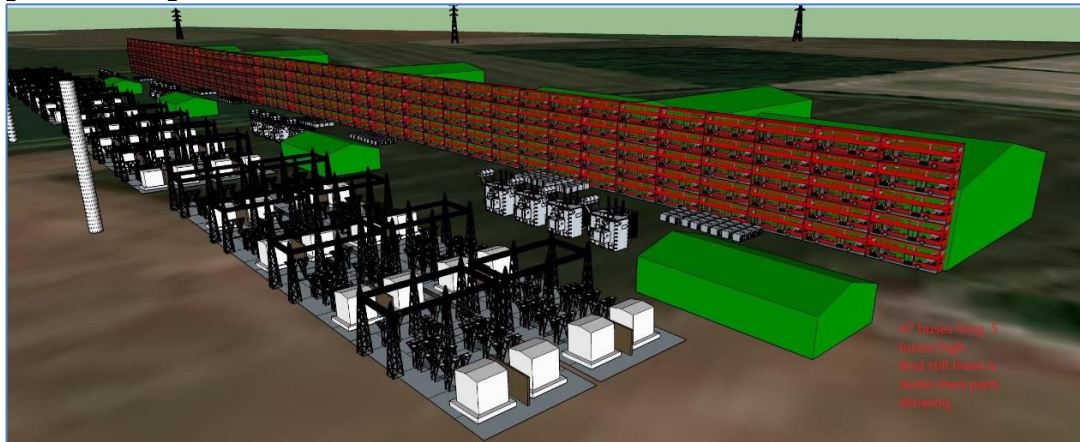


Figure 5.3.10: Angel of the North comparison with proposed onshore substation (scale unverified). Image extract from [REP16-018]

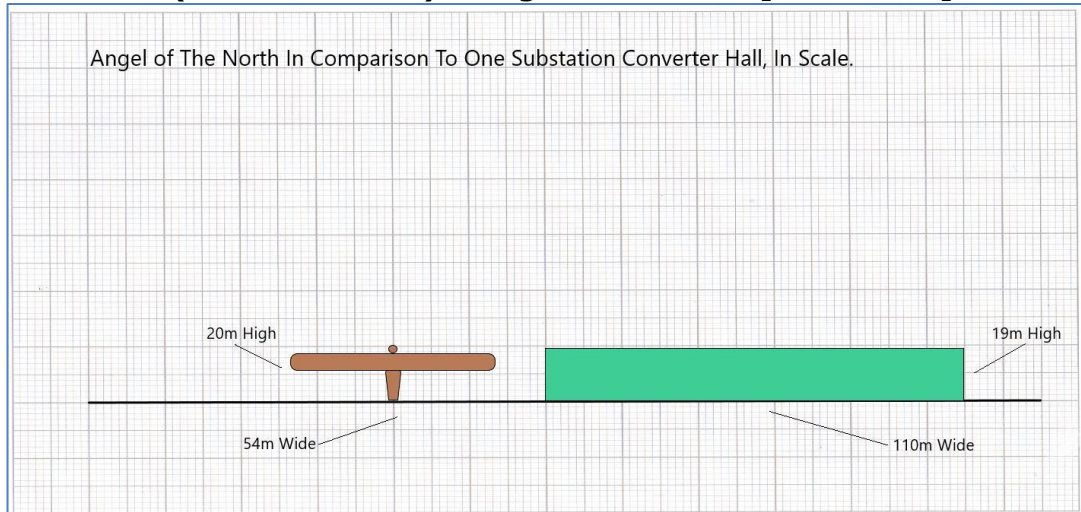
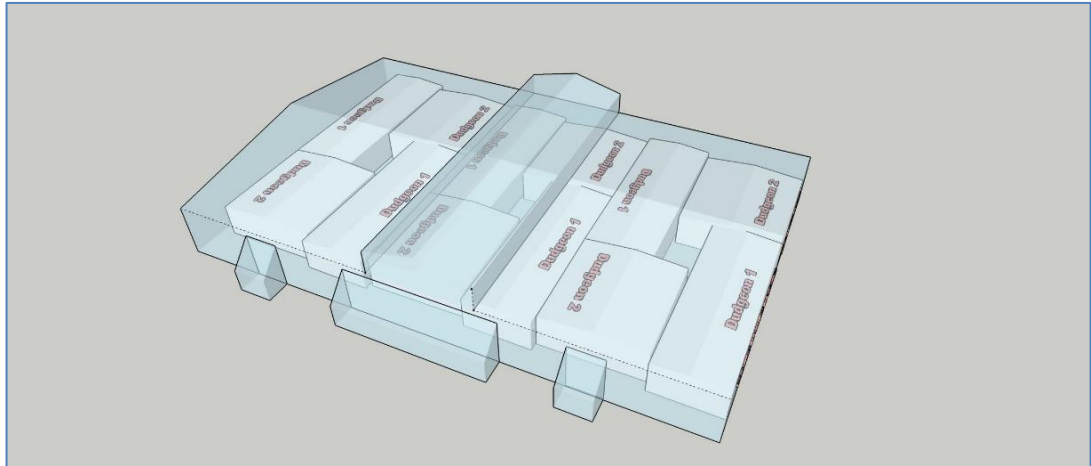


Figure 5.3.11: Necton Farm Barns comparison with proposed onshore substation (scale unverified). Image extract from [REP6-052]

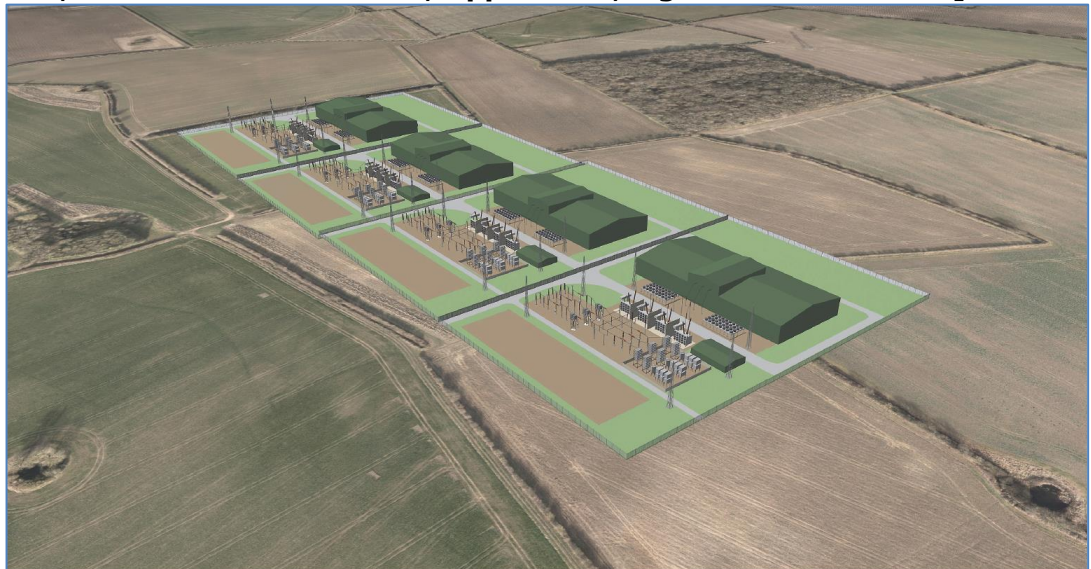


Figure 5.3.12: Existing Dudgeon substations comparison with proposed onshore substation (scale unverified) Image extract from [REP13-055]



- 5.3.114. The Applicant stated that producing visualisations in which the converter halls are placed in a context in which they would never be seen is misleading because there are no especially close range viewpoints so the converter halls would not be experienced at close proximity; and that this was a deliberate intention achieved through the site selection process [REP5-045, Q2.9.4.1].
- 5.3.115. However, the Applicant did include isometric visualisations from an elevated position to the south east of the site in the DAS. They present an indicative interpretation of the proposed onshore project substation's key functional requirements underpinning the Zoning Plan. Scenario 1 is shown below (Figure 5.3.13), which includes the Norfolk Vanguard OWF substation (farthermost two converter halls and electrical infrastructure).

Figure 5.3.13: Applicant's Birds' Eye View. Image extract from [REP14-014, Isometric Visualisation, Appendix 3, Figure 30: Scenario 1]



- 5.3.116. The ExA accepts the Applicant's point regarding the approach for visualisations needing to be contextual. The ExA has based its understanding of the adverse visual effects on the ES information,

submissions from the Applicant and the ExA's USIs and ASI. Notwithstanding this, the ExA found the size comparisons that the local IPs submitted to make their points had some value in appreciating the overall mass of the buildings, as did the Applicant's isometric visualisation.

Effectiveness of bunding and screen planting

- 5.3.117. IPs did not consider that the mitigation planting proposed would provide sufficient screening for either the proposed onshore project substation or the National Grid substation extension. There was an unwavering call for bunding of up to 10m or 15m high on which trees could be planted [REP5-088]. Necton PC and NSAG wanted this requirement set out in the DAS and made suggestions for locations to address views of both substations [REP7-055, page 2] and [REP10-049, Q4.9.6.4]. The bunding's potential function was illustrated at ISH3 using the physical model presented by Necton PC [REP4-029].
- 5.3.118. Bunding was also suggested by landowners [REP10-072], [REP13-050] and [REP13-052]. The NFU/LIG, stated that in its opinion bunding is not always the best solution [REP4-036, Section 3]. The NFU was also one of the IPs requesting that the onshore project substation be constructed into the slope, to reduce its overall height. But the NFU/LIG called for more information in the DAS on the width of bunding and that screen planting should be required on all sides of the convertor building to a width of 30m (not 7m) [REP18-031, Page 16].
- 5.3.119. The Applicant did not consider that high bunding would be appropriate. It argued that subtle earthwork bunds at around 1 to 2.5m would be considered as part of the mitigation at the onshore project substation [REP4-013, Item 4b(ii)]. Regarding bunds at the proposed National Grid substation extension, the Applicant stated that an additional land-take of 80m would be required, thus losing agricultural functionality and necessitating the import of large amounts of fill [REP6-014, Q2.5.2.2].
- 5.3.120. Breckland Council responded to WQ2 that the possibility of bunding around the proposed substation should not be ruled out as details, if necessary and appropriate, would be agreed post-consent between the undertaker and Breckland Council [REP6-041, Q2.5.0.2]. This was later confirmed in the updated SoCG [REP9-013, Table 8, Page 21] and in the updated OLEMS [REP14-020, para 71].
- 5.3.121. There was also a call by some IPs for larger plant material to be used for mitigation at the time of planting [REP13-050, point 5] and [REP18-031, Page 16]. The point being made was that small material would not provide any immediate screening. The Applicant explained that growth rates are generally faster for small plant material like whips, but agreed to amend the OLEMS to incorporate a commitment to larger trees in select locations, where their size would help mitigate adverse visual impact [REP14-036, Q5.9.5.7]. This was added to the OLEMS as was a commitment to explore opportunities for advance planting on land not required for construction purposes [REP14-021, para 66 to 67].

- 5.3.122. Regarding bunding, the ExA agrees with those parties who consider that any bunding should blend with the local landform, which would preclude very high, steep bunding such as that suggested by Necton PC, NSAG and others including landowners. However, the ExA is of the opinion that bunding with planting is only part of what should be considered under good design, when accounting for functionality and aesthetics of the proposed substations (NPS EN-1, para 4.5.1). The ExA welcomes the Applicant's addition to the OLEMS committing to the selective use of larger plant material in prominent locations.

Levels

- 5.3.123. Requests for lowering the ground levels of the proposed substations to reduce the heights and therefore visual impact were made [REP11-029]. At the end of the Examination NSAG repeated its call for sinking substations into the ground as well as for high earth banks [REP17-011, point 2 and 5]. Turning to the proposed National Grid substation extension, IPs had asked for attention to be paid to the ground level for the substation extensions and for them to be as low as possible [REP5-085].
- 5.3.124. Regarding levels, the Applicant explained that it had conducted an indicative cut and fill assessment of the onshore project substation footprints to achieve a uniform platform level with neutral cut and fill, which has informed the "*existing ground level*" to be secured in the dDCO. Also, that some fill would be available from excavation of attenuation ponds and other minor earthworks to use for bunding [REP5-045, Q2.9.3.4].
- 5.3.125. There was an inconsistency between what had been pointed out to the ExA on the ASI regarding how the ground levels for the National Grid substation extension for Scenario 1 would be set and the Applicant's response to WQ3 [REP7-017, Q3.5.3.6]. The Applicant mentioned that a consistent level with the existing substation would need to be maintained. Yet the lower levels of the proposed site had been pointed out during the ASI [EV8-002]. In response the Applicant explained that the ground levels would only be set during detailed design, that safe electrical clearances must be maintained but that where opportunities to use a lower ground level existed, these could be considered [REP10-034, Q4.9.6.2].
- 5.3.126. The ExA asked the Applicant to confirm if R18(2)(g) which includes "*proposed finished heights, form and gradient of earthworks*" within the matters for approval by the local planning authority under the LMS would cover setting of ground levels for Work No.10A (the proposed National Grid substation extension). The Applicant confirmed that it would [REP10-034, Q4.9.6.2(b)]. The Applicant made an addition to the OLEMS, which confirmed that the LMS would be for the onshore project substation and the National Grid substation extension and that bunding and level changes would be considered further in consultation with Breckland Council [REP14-020, para 71].

- 5.3.127. In terms of the ground levels, the ExA is now satisfied that Breckland Council would have a role in terms of approvals regarding the setting of the ground levels for the proposed substations. But this matter would be submitted under two separate requirements; R16(4) in the DAS and R18(2)(g) in the LMS, and forms part of requirements which cover an extensive amount of other information. For Scenario 1, there would be additional complexities of how ground levels for the consented adjacent Norfolk Vanguard OWF substations would be managed. This led the ExA to examine this matter further in terms of a holistic approach to site planning and the complexity of post-consent discharge approvals. These are reported in subsections below.

Lighting

- 5.3.128. NSAG questioned the appropriateness of the proposed lighting at the proposed substations from a visual and wildlife point of view and in terms of dark skies [REP4-045] and [REP4-049]. Another IP was also concerned about adverse effects arising from lighting [RR-038] and one landowner raised questions regarding lighting and refers to the Dudgeon substation, where it is felt light pollution has not been kept to a minimum [REP5-087], [EV13-011] and [REP13-050].
- 5.3.129. The Applicant provided a full explanation of construction and operational lighting requirements which would be mitigated through the approval of an Artificial Light Emissions Management Plan, which would form part of the CoCP. The Applicant explained that during operation the substations would not normally be manned and therefore temporary site lighting would be required only during maintenance activities, which would average once per week [REP5-045, Q2.9.0.1]. The Applicant also responded to points made at OFH3 indicating it had been in dialogue with the landowner and provided details of operating procedures and construction practice [REP13-015, Ref 18].
- 5.3.130. Mitigation of effects of lighting on birds and bats is reported in Section 5.6 of this Recommendation Report and lighting during construction is reported in Section 5.4, the comments in which would apply to the construction stage lighting at the substations.
- 5.3.131. The ExA is content that the levels of lighting secured by R20(2)(c) would be adequate for mitigating adverse visual effects at the substations and adverse wildlife effects during construction and that R24, the EcoMP would make operational provision. The ExA notes that the ES mentions that there are no Dark Sky Places located in Norfolk under tourism [APP-242, para 142]. The ExA is content with the findings of the visual assessment of no significant adverse effect, that permanent lighting is not required because the proposed substations would be unmanned and would be lit only during maintenance activities, but that construction lighting would add to the prominence of the construction activities in winter months.

The ExA's reasoning on the landscape and visual impact of the proposed substations

- 5.3.132. The ExA acknowledges the creative and active engagement by IPs on the matter of the size of the proposed substations and their suggestions regarding mitigation for adverse landscape and visual effects. Whilst the ExA does not recommend the tall screen bunding that some IPs suggest, the ExA welcomes the Applicant and Breckland Council's agreement that further work post-consent would be undertaken in terms of extent and design of bunding and screen planting. This relates intrinsically with the ground level design, which would also be a matter for post-consent submissions and approvals. Regarding lighting the ExA is satisfied that lighting levels are controlled through the dDCO operationally and the OCoCP for construction stage.

Consultation and engagement on proposed substations at Necton

- 5.3.133. The application includes a Consultation Report [APP-027] which is supported by a large number of appendices [APP-028] to [APP-199]. The duty to consult the local community was found to be adequate in accordance with PA2008 Section 47, when the application was accepted [PD-001]. In terms of consultation, the Applicant set out and refers to lessons learned from the Norfolk Vanguard OWF examination in its Consultation Report. The Applicant mentions that there were ongoing concerns by local community stakeholders, specifically citing the choice of location for the proposed onshore substation as one, putting this down to a lack of understanding on the part of the community stakeholders [APP-027, para 822].
- 5.3.134. The ExA is content that the Applicant's consultation was adequate as set out in PA2008. However, the ExA notes that there appear to be frustrations about the consultation from both the Applicant and the local community in Necton, which have if anything, become more pronounced during the course of the Examination.
- 5.3.135. The ExA disagrees with the Applicant's view that local community stakeholders in Necton did not understand matters to do with the proposed substation locations. The ExA found the local community members to be well-informed and knowledgeable about the detail of their local area.
- 5.3.136. It was suggested that the pre-application community consultation on the substations at Necton was insufficient by the local MP for mid Norfolk [RR-042]. Frustrations with the processes used for one consultation event were reported by some of the participants [REP3-025]. There was uncertainty in the minds of locals as to when and what they were consulted upon. This seems to have arisen because of lack of clarity over consultation on the Proposed Development as opposed to that for the Norfolk Vanguard OWF and the move to using two scenarios for this application [REP4-052].
- 5.3.137. As the Examination progressed, submissions indicated that not all IPs had appreciated the potential significance on substation dimensions that the choice of HVDC technology could have. Necton PC stated that "*public consultation in Necton was not complete or adequate and did not use accurate information*" [REP10-049, Q4.9.2.1]. The Applicant strongly

refutes this and states that it consciously set out to far exceed all the standards for adequacy of consultation which are set out by MHCLG [REP11-007, Q4.9.2.1].

- 5.3.138. The ExA pursued this matter because of the importance the ExA attributes to the need for constructive ongoing engagement and consultation on the details that would be secured by R16 and R18 for the proposed onshore project substation in the DAS [REP14-014] and [REP14-016] to [REP14-019]. The ExA considers that should the Order for the Proposed Development be made, trust would need to be rebuilt between the parties in order for the post-consent engagement to progress collaboratively. For this reason, the ExA examined the wording in the DAS and consultation and review arrangements regarding the design process. The ExA also pressed Breckland Council on this matter and listened to the views of the affected landowners.
- 5.3.139. From the outset, the NFU/LIG asked for more information and consultation on behalf of the landowners that would be directly affected by the onshore project substation. The NFU/LIG would like to see the two landowners consulted along with Breckland Council at the first stage of post-consent consultation and made further specific points about how the DAS should be worded, points which remain not agreed with the Applicant in the final SoCG [REP18-031, Pages 12 to 15].
- 5.3.140. On the matter of the NFU's request for the two directly affected landowners to be engaged at the same time as Breckland Council, the ExA agrees with the Applicant that as the discharging authority, it is right that it would be Breckland Council which would determine the purpose and parameters of the engagement process with the Applicant, not the landowners.
- 5.3.141. One of the landowners that would be affected by Scenario 1 land-take for the onshore project substation was concerned about future access arrangements for large machinery to an adjacent land parcel in the same ownership [EV13-011]. A straight edged 12m wide strip (at the narrowest point) was stated to be necessary. The Applicant reported that it had agreed to exclude planting or other constraints to access to address this concern and offered to secure this through private agreement with the landowner [REP13-015, Ref 18]. A plan illustrating the 12m exclusion area was submitted [REP13-020] and incorporated in the mitigation planting plan for the Scenario 1 onshore project substation in the updated DAS [REP14-019]. This still showed a curved edge, but the Applicant explained that this was the minimum area for planting exclusion, not a fencing line [REP15-003, Q5.9.5.1].
- 5.3.142. Breckland Council made it clear in its LIR that it would expect different options to be presented to third parties, which would involve the local community and key stakeholders, for feedback [REP2-062]. The Applicant responded that it would work together with Breckland Council to communicate and implement the design process effectively [REP3-009].

- 5.3.143. Necton PC was concerned that Breckland Council was not representing the views of the residents who would be most affected by the Proposed Development [REP5-064], [REP8-030] and [AS-071]. Breckland Council responded that it needed to take a District-wide view as it represented a wider community, but that it would seek to ensure through the discharge process that the Applicant should maximise screening options including bunding and possible level changes [REP10-044, Q4.9.6.3]. The screening and mitigation options point was reflected in the updated SoCG, [REP9-013, Page 21 to 22]. There was also concern expressed about Breckland Council's ability to resource the post-consenting processes in light of underfunding and understaffing [REP14-075].

The ExA's reasoning on consultation and engagement on substations

- 5.3.144. In later iterations of the DAS, the ExA became slightly more convinced that the wording would help to achieve constructive engagement over the post-consent details. In particular: statements that there would be learning from previous engagement, by naming the range of stakeholders for engagement, and by confirming that Breckland Council and the Applicant would determine what type of process would best enable the desired engagement [REP14-014 para 76 to 81].
- 5.3.145. Yet, there was ongoing strong sentiment expressed at OFH3 (Necton session) and in response to WQ4 regarding the need for post-consent consultation [EV13-011]. This contrasted with the Applicant's conviction that the outline process in the DAS would be sufficient to ensure appropriate dialogue without further protocol. The ExA notes that there is a very strong need for Breckland Council to ensure that the process does indeed result in proactive and meaningful engagement to bring stakeholders' views into the decision-making process, and that the design intention set out in the DAS is delivered. The NFU/LIG added suggestions for consultation in its final SoCG [REP18-031, Pages 12 to 16].
- 5.3.146. The ExA is content that the concerns raised by the landowner have been satisfactorily addressed through the amendment to the DAS and that details of fencing and planting locations that would allow large machinery to access the adjacent field could be agreed post-consent.
- 5.3.147. The ExA notes the stated concern about Breckland Council's resourcing constraints and that there have been staff changes dealing with the Proposed Development at the Council. The ExA considers that the challenges associated with the timing and complexities of onshore post-consent discharge of requirements would be greatest for those relating to the substations. The ExA acknowledges the discussions and stated good intentions regarding Planning Performance Agreements (PPA) but can give no weight as nothing is signed.
- 5.3.148. For this and other reasons described later under Good Design, the ExA explored the potential benefit that the process of design review could bring. It is however also relevant to reflect on the post-consent discharge approvals that would be required.

Post-consent discharge approvals by local planning authorities

- 5.3.149. In response to agenda items for ISH1 and ISH2, the Applicant provided clarity over the rationale for approvals being split over dDCO R16 and R18 [REP4-013, item 4b(i) and Appendix 2]. Diagrams of the different elements of the proposed onshore project substation were provided (Figure 5.3.8). The Applicant suggested that approvals of the LMS under R18 might be submitted in parts such as one for each stage – a stage being geographically determined by local authority boundaries, possibly with a separate stage for the proposed onshore project substation [REP1-041, Requirement 18, item 2].
- 5.3.150. The ExA sought clarification over definition of a “stage”, which was addressed by the addition of a definition in Article 2 of the dDCO, relating a stage to that submitted for approval pursuant to R15 [REP4-013, item 4, page 10]. The Applicant provided a clarification note on phases and stages [REP4-019] and the OCoCP was also updated to include definitions of stages [REP5-045]. The ExA still had concerns over the amount of information to be included within one stage approval. The ExA asked the Applicant and the local authorities their views on sequential submissions for post-consent discharge of requirements and also whether the written scheme setting out the stages under R15(4) should be subject to approval [PD-009, Q2.5.1.5].
- 5.3.151. There was not a consistently held view, other than agreement that disjointed approval requests should be avoided. The definition of “stage” in Article 2 of the dDCO, as provided by the Applicant is retained in the rDCO. Being mindful of the opinions of the post-consent discharging authorities, the ExA has not made any changes to the rDCO to reflect the potential for sequential or partial submissions under requirements. Nor has it amended Schedule 16. However, the ExA remains of the view that the content for approval in R16 and R18 in particular is detailed, complex, expansive in content, contains overlap and inter-relations between the DAS (R16) and the OLEMs (R18), especially for the substations. It also provides for engagement over some elements and would be needed at different times during the design and construction period. There is also overlap between R18, R19 and R24, in particular in relation to hedgerows. It would therefore be incumbent on the post-consent local planning authorities to ensure that they would:
- a. have the right resources to deal with the discharge of requirements;
 - b. be rigorous in commenting on and liaising with the undertaker over the written scheme setting out the stages and any subsequent amendments under R15(4), because the written scheme would be submitted, but not subject to post-consent approval;
 - c. require the written scheme detailing the stages, to include flexibility to account for any potential temporal elements and sequential post-consent staged discharge of requirements if required, as indicated by the Applicant [REP5-045, Q2.5.1.5];

- d. be clear about content, timescales, processes (such as design review) and parties to be engaged or consulted for approvals for R16, R18, R19 and R24;
- e. ensure that final refinements, whilst following detailed technical design, precede construction planning, so that appropriate refinements can be encompassed [REP9-013, Appendix 1]; and
- f. remain aware of and meet the timescales set out in Schedule 16.

Cumulative landscape and visual impact

- 5.3.152. There are two projects which are included in the LVIA's CIA which are Norfolk Vanguard OWF under Scenario 1 comprising long term (20 years), operational significant adverse effects on landscape character and on some visual receptors and Hornsea Project Three OWF under Scenario 2 comprising short term, reversible, construction adverse effects on walkers as visual receptors [APP-242, Table 29.14] and [APP-246, Table 33.14]. The Scenario 1 CIA is stated to have taken Norfolk Vanguard OWF as part of the baseline, as it is assumed to be operational [APP-242, para 125 and para 127]. For all the receptors assessed in the CIA, the overall assessment of significance and duration is the same as for the same receptor for Scenario 1 [APP-242, Table 29.13 and Table 29.18].
- 5.3.153. There are no outstanding matters regarding cumulative impact assessment for landscape and visual matters from parties with whom SoCGs are signed (Breckland Council, Broadland DC, NCC, NNDC and Ørsted) [REP10-035, Table 3.20]. However, many IPs are concerned about what they refer to as cumulative adverse landscape and visual effects from the substations. The ExA has considered these at the same time as Scenario 1.
- 5.3.154. The ExA agrees with the Applicant's statement in its CIA methodology, that two or more developments may complement one another or be discordant with one another [APP-677, para 72]. In the ExA's view it is this matter which must be addressed to meet the NPS requirements for good design (NPS EN-1, Section 4.5). The Applicant's assessment and visualisations assume an "*identical twins*" [REP17-016] approach could be achieved. The ExA disagrees that this is secured. There is nothing secured which would ensure that an holistic design approach to levels, materials, massing, form and landscape design could be enforced post-consent to mitigate cumulative adverse landscape and visual effects other than an addition to the DAS that states for Scenario 1 "*consideration will be given to a design approach which can be applied across both projects*" [REP14-014, para 43].

Issues: Good design

- 5.3.155. The Applicant's LVIA refers to the requirement for demonstrating good design as set out in NPS EN-3 and states that this would be achieved by avoiding sensitive features where possible and the delivery of embedded mitigation measures. The DAS states that the requirements for good design in energy projects are made clear in NPS EN-1, but the DAS does not provide any further specific detail, nor indicate how the Proposed

Development would meet the requirements for good design [REP14-014, Section 2.1.1].

Design Guide

- 5.3.156. At ISH1, the Applicant explained that it had separated out matters subject to Rochdale Envelope parameters in R16 and mitigation through outline plans in R18. The ExA asked the Applicant and Breckland Council to work together to agree what more detail on design and function could/should be secured for the substations and environs in the dDCO [EV3-005, point 12]. During the Examination, in response to this and WQs the Applicant provided additions to R16 and R18, the DAS and the OLEMS which provided further clarification of the design process and commitment to the preparation of a Design Guide for the proposed onshore project substation. These included:
- a. clarifications in terminology around the proposed onshore project substation and its converter halls (R16(1), R16(2), R16(5), R16(6));
 - b. addition of sustainable drainage measures integrated into the landscape approach for the proposed onshore project substation to be included in the LMS (R18);
 - c. addition of guidance on use of materials and colours relating to the onshore project substation to be included in the LMS (R18);
 - d. addition of a flow diagram and explanation of the design process for the proposed onshore project substation (which was updated to signpost which part comprised local design review);
 - e. commitment to producing a Design Guide for the proposed onshore project substation;
 - f. commitment to engagement with Breckland Council and agreement with Breckland Council to collaborate over wider engagement which would include at a minimum Necton PC, Holme Hale PC, relevant landowners and closest residents;
 - g. addition of illustrative zoning plans for the proposed onshore project substation to the DAS which showed that the converter halls, control buildings and lightning masts could be accommodated in the northern zone of the site (furthest away from Necton and Ivy Todd) [REP14-019];
 - h. addition of an outline for the Design Guide at DAS Appendix 1;
 - i. addition of photographs to the DAS illustrating what is meant by "*agricultural style*" [REP14-014, Appendix 2];
 - j. commitment to a colour and material comparative study for the proposed cladding of the onshore project substation including the use of photomontages and test panels for use outside; and
 - k. inclusion of a Preliminary Design Report [REP14-045] and [REP14-014, Appendix 3].
- 5.3.157. During the Examination, the Applicant added a reference to the guidance section in the DAS that the project design would take account of the National Infrastructure Commissions' (NIC) Design Principles for National

Infrastructure⁹, which had been published during the Examination [REP7-005, para 15].

- 5.3.158. The ExA found the explanations of the rationale for approvals being split over dDCO R16 and R18 [REP4-013, item 4b(i) and Appendix 2] helped in explaining which elements of the proposal would still need to be finalised as required by NPS EN-1, para 4.2.7. Cross referencing between the DAS and the OLEMS assisted understanding where matters such as the converter hall details would be covered by both requirements. The ExA is satisfied that the additions and changes to R16(1), (2), (3), (5) and (6) and R18 (2)(i) and (2)(j) aid clarity and consistency and has therefore retained them in the rDCO.
- 5.3.159. The ExA welcomes the additional detail provided in the Preliminary Design Report, appended to the DAS. In terms of materials, the ExA notes the comparative analysis was useful, but considers the findings of sheet metal being the most appropriate would need to be revisited once the equipment had been finalised, as suggested by the NFU/LIG [REP18-031, pages 12 to 13]. Likewise, colour would need further consideration against the final massing and form and dependent on which scenario was being taken forward.
- 5.3.160. The ExA welcomes the inclusion of the NIC's Design Principles for National Infrastructure in the DAS, which are stated to ensure good, unified and environmentally sound design based on principles for climate, people, places and value. If consented, it would be for Breckland Council and the Applicant to satisfy themselves that those principles are being met through the processes they adopt. The ExA urges the Applicant to give serious consideration to the appointment of a Board level design champion for the Proposed Development post-consent, should the SoS be minded to make the Order.

Detail versus flexibility, how this is reflected in the Order

- 5.3.161. There were widely held views that insufficient information on the detailed design of the proposed substations was provided in the application and secured in the dDCO. These included:
- a. Breckland Council called for due regard to be given to the distinctive qualities of proposed structures in terms of their detailing, quality of materials and relation to surroundings [REP2-062];
 - b. Necton PC, NSAG and some local residents called for more detailed information to be provided and for local involvement in details of the proposed substations and landscape mitigation [REP2-083], [REP5-063] and [REP5-085]. This was in part driven by views held that what was built at the Dudgeon substation was different from that which had been consented [EV13-009], [EV13-011];

⁹ National Infrastructure Commission; Design Group, Climate People Places Value, Design Principles for National Infrastructure, February 2020.

- c. Holme Hale PC said that it did not agree with reliance on landscape mitigation rather than design, it understood that finer detail would need to come later, but felt that the Design Guide should have been produced during the Examination [EV13-011] and [REP16-020];
- d. the NFU/LIG and landowners themselves repeatedly called for more information about the substation itself and associated mitigation planting [RR-044], [REP13-050] and [REP18-031];
- e. representation at OFH1, that no references to the design of the substation could be found [REP1-069]; and
- f. representations at OFH2 and OFH 3 (Necton session) asked for more detail, questioned how design would be accounted for, who would make decisions on materials and made points regarding the technically challenging nature of the design details and whether Breckland Council would have the resources to deal with the complexities of these approvals [EV13-009] and [EV13-011].

5.3.162. The Applicant was insistent that more detail was not required because the EIA was conducted on the basis of a 'Rochdale Envelope' series of maximum extents for the project which are secured under R16. The Applicant argued this is in accordance with NPS EN-1, para 4.2.8 making the case for the flexibility needed to allow for the future detail design [REP3-003, Q5.3.3]. However incremental additions were made to the DAS during the Examination, including a Preliminary Design Report [REP14-014, Appendix 3] which responded to some of the IPs' and ExA's concerns.

5.3.163. The ExA notes that the SoS Scoping Opinion had indicated that the ES should provide details of the number of and dimensions of the buildings required along with site layouts [APP-687]. The ExA wholly accepts the Applicant's need to maintain flexibility at the dDCO stage because of unknown technical details and layouts which would differ between suppliers prior to procurement [REP13-015, point 14]. The ExA accepts that the ES had set out the maximum extent to the best of the Applicant's knowledge (NPS EN-1, para 4.2.8).

5.3.164. But the ExA does not accept that the Applicant had gone far enough in meeting the criteria for good design for energy infrastructure (NPS EN-1, Section 4.5). The ExA could not satisfy itself that the Applicant/undertaker would be required to take into account both functionality and aesthetics, nor that consideration would be given to the design and sensitive use of materials to assist in ensuring that the proposed onshore substation would contribute to the quality of the area (NPS EN-1, para 4.5.3 to 4.5.4).

5.3.165. The ExA did not consider that the proposed onshore substation "*demonstrated good aesthetics as far as possible*" (NPS EN-1, para 4.5.1), and was concerned that the post-consent discharging authority would have no basis secured on which to require that the details would deliver good design, other than a commitment to mitigation planting, which would still result in significant adverse effects over a timescale considered unreasonable by the ExA.

Design review

- 5.3.166. Whilst acknowledging the Applicant's need for flexibility, the ExA asked the Applicant to consider the role an independent design review process might play (NPS EN-1, para 4.5.5 and NIC Design Principles for National Infrastructure) and to provide further detail on material options, colours, massing and architectural style for the proposed onshore project substation [EV14-005].
- 5.3.167. The Applicant set out its case, committing to undertaking a design review conducted in a local forum at an early stage and updated the DAS to show certain stages would comprise a local design review [REP14-014, Plate 4]. However, the Applicant raised concerns regarding an independent design review panel because of the functional requirements of the substations, and because it felt a design panel's objectives might differ from the Proposed Development's aim to be as discreet as possible, and might wish to see the substations as more prominent features [REP13-018].
- 5.3.168. The ExA sought opinions on the need for a local and/or an independent design review and without prejudice comments on how this might be secured [PD-022, Q5.9.5.5 and Q5.9.5.6]. Breckland Council agreed with the Applicant's D13 position and supported design review at an early stage locally with local stakeholders [REP14-047, Q5.9.5.5]. The NFU/LIG supported a local forum for design review but would want further detail on the workings of an independent design review before commenting further [REP14-061]. All other parties that responded (Necton PC, Holme Hale PC, NSAG, the two affected landowners) made the case for an independent design panel and most suggest that both local and independent panels should be secured [REP14-051], [REP14-068], [REP14-075], [REP14-078], [REP15-015] and [REP16-020].
- 5.3.169. The Applicant responded that if the ExA is minded to recommend inclusion of design review, wording in R16(4) might be the best place and that there would be no need for it to also be secured in the DAS [REP14-036, Q5.9.5.6].
- 5.3.170. The ExA considers that the Applicant's concerns regarding the approach an independent design panel might take to be speculative and unfounded. The ExA considers there is more than sufficient background in the LVIA and DAS to brief a design panel on a design approach which is based on blending with the existing environs. The ExA has included wording, which was consulted upon during the Examination to secure the onshore project substation design is subject to an early independent design review. This is added to R16(4) of the rDCO, which was the location suggested by the Applicant.
- 5.3.171. The ExA is aware this goes against the views of the Applicant and Breckland Council. The ExA has made this recommendation because of:
- a. the strong representations made by the community regarding the design of the substations and the need for mitigation;

- b. the fraught nature of the engagement that has gone before, which does not convince the ExA that a local forum for a design review could deliver an overview of strategic design decisions;
- c. the concerns expressed by some IPs regarding Breckland Council's resource constraints;
- d. the complexity of the approvals processes over more than one requirement which does not lend itself to an holistic overview;
- e. the need in Scenario 1, where Norfolk Vanguard OWF approval processes could also be running concurrently (or ahead), for an integrated, overall design approach to ensure that adverse landscape and visual effects are minimised through appropriate siting and design details (NPS EN-1, para 5.9.22); and
- f. such an addition to R16(4) is in line with that set out in regard to consenting applications where details are still to be finalised (NPS EN-1, para 4.2.9) and reflects the proposition that applicants should consider taking independent design advice and use a design review service (NPS EN-1, para 4.5.5).

5.3.172. Should the SoS disagree with this addition to R16(4), the ExA can confirm that the additional wording can be deleted from the requirement and there would be no concomitant changes necessary if the SoS were to adopt the wording in the Applicant's final dDCO drafting.

Overall holistic design approach to site planning

5.3.173. As stated earlier, it is the ExA's view that there is potential for more adverse visual effects than those illustrated in visualisations and in the DAS Preliminary Design Report because of the lack of control over the converter hall designs for the two separate, co-located projects. In particular the ExA had concerns about how, under Scenario 1, the undertakers would work together to ensure a holistic design approach for the two different projects and how Breckland Council would be able to control this.

5.3.174. This point is well made in a letter from an IP to the SoS in connection with the Norfolk Vanguard OWF ExA's Recommendation Report, submitted into this Examination, which asks "*what mechanism is in place to cope with such a situation, to ensure a sensible, and coherent total substation construction...*?" [REP17-016, point 10].

5.3.175. The visualisations provided in the colour study in the Preliminary Design Report all illustrate identical design approaches for both projects [REP14-014, Appendix 3, Figures 19 to 27], described as "*identical twins onshore*" [REP17-016]. The visualisations included in the Applicant's Preliminary Design Report assume that there would be mechanisms to deliver a consistent design approach to the converter halls and electrical equipment for the substations from two different OWFs, which would be co-located. In the ExA's opinion, this is not representing the worst case and is not secured in the dDCO for the Proposed Development. Under Scenario 1 it would be down to Breckland Council's post-consent discharge of requirements tied to rather loose wording in the DAS (secured in R16) which says that consideration would be given to a design approach which can be applied across both projects. This would

additionally need to consider the approach to landform, levels and bunding to ensure a strategic site-wide approach.

- 5.3.176. The need for a holistic approach to address good siting, and sensitive use of materials to meet NPS EN-1, para 4.5.3 is another reason why the ExA strongly recommends that the SoS retains the addition to R16(4) to require an early independent design review. The SoS may also wish to satisfy themselves that a co-ordinated approach with Norfolk Vanguard OWF would be addressed through the planned Co-operation Agreement between the Applicant and Norfolk Vanguard OWF [REP5-045, Q2.9.3.4].

National Grid substation extension

- 5.3.177. The ExA noted that the SoS questioned IPs during the decision period of the Norfolk Vanguard OWF as to whether the design of its proposed National Grid substation extension (Work No. 10A) should be controlled further by way of changes to wording of R16(9) [REP3-012, para 18]. As the works involved in the Proposed Development's National Grid substation extension would be very similar (also Work No. 10A, also secured in dDCO R16(9)), the ExA sought views on this matter at ISH2. The Applicant was clear that the SoS's proposed changes could not be accommodated for technical reasons, because design and requirements are predetermined by international standards and National Grid's technical specifications [REP4-013, item 4b(iii) and (iv)].
- 5.3.178. Breckland Council called for powder coating which would minimise glare [REP4-026]. The Applicant explained this could not be secured for technical reasons because the materials used are dictated by electrical and structural performance characteristics for operating equipment at 400kV [REP5-045, Q2.5.3.3]. Further points were made at OFH3 (Necton session) about the reflectivity and shininess of the Dudgeon substation [EV13-011]. Both the Applicant and National Grid stated that it would not be possible to alter the appearance of finishes, but that the busbars would dull overtime as they oxidise [REP14-036, Q5.9.5.2] and [REP14-062].
- 5.3.179. The ExA notes that no further controls were added to R16(9) in the made Order for the Norfolk Vanguard OWF. The ExA is content with the Applicant's explanation regarding the reasons for no further controls for Work No. 10A in the dDCO. Accordingly, the ExA has not made changes to dDCO R16(9) in the rDCO.

The ExA's conclusions on good design

- 5.3.180. Whilst the ExA agrees that some elements of how the design process had been conducted and how the design had evolved were demonstrated in the application (NPS EN-1, para 4.5.4), further information was provided during the Examination, which aided understanding. The ExA is also mindful of the strong community feeling regarding consultation (which has been reported earlier) and the desire for more detail. The ExA is keen to ensure that the further evolution of the detailed design for the proposed onshore substations benefits from constructive local

engagement on matters that can be influenced as well as independent design advice.

- 5.3.181. The ExA welcomes the additions to the DAS including the Design Guide and the commitment to use a local design review process. The ExA also welcomes the Zoning Plans, which would limit the taller converter halls to part of the site farthest from sensitive visual receptors, thereby constraining the original Rochdale Envelope.
- 5.3.182. The ExA notes the Local Plan policies to which Breckland Council's LIR referred and considers that not all these policy requirements would be capable of being met. But that through outputs from the design process, including design review (local and independent) and the proposed Design Guide, better adherence to those policy requirements could be achieved.
- 5.3.183. The ExA considers that successful outcomes would depend on:
- a. Local authorities having the right resources in place at the right time to engage with the Applicant serially over time for the discharge of requirements R16, R18, R19 and R24 in the rDCO and to meld this with any similar discharge of requirements which might be taking place for the Norfolk Vanguard OWF, particularly in the area of the substations;
 - b. taking on board the findings from an early, well-briefed, independent design review panel secured by the ExA's inclusion of R16(4) in the rDCO;
 - c. the Applicant engaging with Breckland Council, the local community representatives, residents and landowners at appropriate times, sufficiently early for there to still be opportunity for parties to influence the detail, conducted in an agreed format for local design review. This would be achieved via the DAS secured by R16(4) in the rDCO; and
 - d. the local community, with whom the Applicant engages, understanding where they can influence the design process, and where technical and functional priorities would need to take priority.

Issues: Open Space and Green Infrastructure

- 5.3.184. There are two areas of open space which could be affected identified by the Applicant; the beach and foreshore at the landfall at Happisburgh South and the crossing of the Marriot's Way long distance footpath. No surface work is proposed at either location due to the use of trenchless crossing techniques and there is no loss of open space or impact on public access. The ExA therefore considers that there is no requirement for the application to consider the provision of new or additional open space. This is also described in Chapter 8 of this Recommendation Report.

- 5.3.185. In terms of effects on green infrastructure¹⁰, the connectivity currently provided by the hedgerow networks would be fragmented. The Applicant set out the additional lengths of hedgerow replacement over that removed (1,040m for Scenario 1 and 3,364m for Scenario 2) and stated that it has been designed to connect existing habitats [REP5-045, Q2.9.3.2]. The Applicant explained where opportunities to enhance biodiversity would be taken including areas at the substations which would increase the area given over to wildlife [REP2-021, Q2.0.3].
- 5.3.186. Replanting for hedgerow removal would be replaced in situ apart from 6m gaps over cables. The strategic role that the mitigation planting would play at the substations and their surroundings is shown to be designed for connectivity and consolidating green corridors for wildlife in the case of both scenarios [APP-495] and [APP-508]. The multifunctional aims of the mitigation planting (in addition to a screening function) would include strengthening landscape character, restoring historic enclosure patterns (suggested off-site enhancements to address cumulative adverse heritage effects such as hedgerow bolstering and planting are not secured [APP-241, para 329 to 330]) providing connectivity, increasing biodiversity and attenuating run-off. This is set out in the OLEMS, secured by R18 [REP10-015, para 52].
- 5.3.187. It would be for the post-consent discharging authorities, together with the relevant nature conservation body, to satisfy themselves that this multifunctionality would be achieved through the detailed designs and maintenance plans submitted in the LMS under R18(2), R19 and the EcoMP in R24. This is another matter for which the availability of sufficient and relevant capacity to carry out post-consent discharge of requirements included in the rDCO would be important.
- 5.3.188. During the course of the Examination, the Applicant added the details of the sustainable drainage measures to be integrated with landscape details for the onshore project substation to the matters for approval in the LMS at R18(2)(i). The ExA agrees with this addition and has retained it in the rDCO.
- 5.3.189. The case made for adopting a net gain approach, the Applicant's response setting out its case against and the ExA's conclusion are reported in Section 5.6 of this Recommendation Report.

Decommissioning

- 5.3.190. The detail and scope of the onshore decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning, agreed with the regulator and a decommissioning plan would be provided. As such, for the purposes of a worst case scenario, impacts as for the construction phase have been assumed [APP-242,

¹⁰ "Green infrastructure is a network of multi-functional green spaces, both new and existing, both rural and urban, which supports the natural and ecological processes and is integral to the health and quality of life of sustainable communities." (NPS EN-1, footnote 130)

Section 29.7.6]. This is covered in the Schedule of Mitigation [REP18-017, Table 22, Ref 22.11].

Compliance with the NPPF

- 5.3.191. The ExA is satisfied that the requirements from the NPPF including satisfactorily addressing cumulative landscape and visual effects, taking a strategic approach to green infrastructure networks and the need to achieve good design would be met with the requirements in the rDCO. These would be dependent on future approvals, which if in line with the NPS and Local Plan policies would also meet those of the NPPF.

Conclusions

Alternatives

- 5.3.192. The ExA has considered the points made in detail regarding alternatives for the proposed landfall, cable corridor routeing, HVDC technology and locations for substations and overhead line modifications. Whilst the ExA disagrees with the weight the Applicant attributes to the visual effects for A47 motorists in discounting the Top Farm site, the ExA agrees that there is not an alternative for any aspect of the Proposed Development put forward which would meet the tests set out in NPS EN-1, para 4.4.3. The ExA therefore concludes that the Applicant has undertaken its consideration of alternatives for landscape and visual matters adequately and the requirements of NPS EN-1, Section 4.4 have been met.

Landscape and visual effects

- 5.3.193. In terms of methodologies used, the ExA is satisfied that the visualisations used in the LVIA in the ES are fit for purpose, although they are not representative of the worst case, in the ExA's opinion. The ExA welcomes the commitment that photomontages would be used for future post-consent consultations. It would be important that under Scenario 1, accurate representation of the Norfolk Vanguard OWF infrastructure is incorporated.
- 5.3.194. Turning to the LVIA generally, the ExA finds the methodology unduly complicated which leads to uncertainty over the accuracy of the findings. The ExA found it telling that the Applicant itself commented that "*matters relating to LVIA in particular are often subjective*" [REP11-007, Q4.9.2.3]. Even with the additional explanations of methodology, it is not clear to the ExA how and where professional judgement has been applied. The ExA does not question the role of professional judgement in an assessment. However, the ExA notes that the assessment methodology which adopts a binary assessment of significance, results in the majority of the adverse effects being not significant. Having made that point, the ExA did not, and does not challenge the overall findings, but has borne this in mind in reaching other conclusions on landscape and visual matters and the need for mitigation. Nevertheless, the ExA is satisfied that the assessment has followed guidance and covered construction and operational stages and assessed the effects of the cable

corridor (NPS EN-1, para 5.9.5 to 5.9.7, NPS EN-3, par 2.6.37 and NPS EN-5, para 2.8.2 in as much as it applies).

- 5.3.195. The ExA agrees with the Applicant's LVIA findings for the landfall and cable corridor for both scenarios. In this regard the adverse operational stage landscape effects would not be significant after mitigation through the replacement planting, which would be subject to post-consent discharge of requirements for detailed design. Likewise, adverse operational stage visual effects for the landfall and cable corridor would be addressed and mitigated in the same way.
- 5.3.196. The adverse visual operational stage effects of the proposed substations for both scenarios, the acceptance by both the Applicant and Breckland Council that further mitigation may be appropriate, the absence of detail over precise levels, height, mass, extent and colour of structures, the noted frustrations surrounding the consultation that had been undertaken and the complexities of the approvals processes in particular for R16, R18 and R24 are all matters which convinced the ExA of the need to examine matters and secure more detail for future approvals in the DAS and OLEMS. Additionally, although the Applicant provided examples of the proposed architectural typology, it was unable to provide examples of a similar scale (NPS EN-1, para 5.9.19).
- 5.3.197. In terms of effects on landscape character at Necton in the vicinity of the proposed substations, the ExA finds that for the reasons stated above regarding the Applicant's methodology the adverse effects of the Proposed Development on the landscape character types and landscape character units in which the substation sits could be understated when an accumulation of not significant adverse effects are also taken into account.
- 5.3.198. Even acknowledging that virtually all energy NSIPs will have an effect on the landscape and are likely to have adverse visual effects for receptors round the proposed sites (NPS EN-1, para 5.9.8 and 5.9.18), the ExA has taken into account that the proposed onshore project substation (for both scenarios) would result in residual significant and not significant adverse landscape and visual effects.
- 5.3.199. The ExA gives particular weight to the longevity of the adverse landscape and visual effects, which in the ExA's opinion are not capable of reversal in a reasonable timescale (NPS EN-1, para 5.9.16). Other matters which in the ExA's view could impede careful consideration being given to design details, such as siting, landscape integration, colour and materials (NPS EN-1, para 5.9.17, 22) include the complexities of the post-consenting approvals processes, the resources that would be available to local authorities to enact their role in discharge of requirements and the utmost importance under Scenario 1 of taking an integrated design approach to all the substation infrastructure proposed to minimise harm to the landscape (NPS EN-1, para 5.9.17).
- 5.3.200. However overall, it is the ExA's opinion that the adverse landscape and visual effects do not outweigh the benefits of the Proposed Development

(NPS EN-1, para 5.9.15 and 5.9.18), but that effort must be made in terms of both mitigation and detail design. The ExA does not consider that reduction in function is necessary (NPS EN-1, para 5.9.21); rather focus needs to be put on design. Taking all the matters reported above, the ExA ascribes medium weight against the Order being made to the adverse landscape and visual effects.

Good Design

- 5.3.201. The ExA initially was not satisfied that the DAS presented sufficiently robust controls to achieve a good design outcome. The updated DAS has taken on board a range of additions, which the ExA considers would give Breckland Council more grounds on which to base post-consent discharge of requirements for the design process and final design. However as stated above, the ExA has ongoing concerns about the post-consent process for discharge of requirements in terms of complexity, timing, local authority resourcing and how Scenario 1 would deliver an integrated design approach bearing in mind the made Order for Norfolk Vanguard OWF.
- 5.3.202. Therefore, the ExA has included an addition to R16(4) in the rDCO which states that the details should be subject to an early independent design review (NPS EN-1, para 4.5.5). The ExA considers this would help to alleviate concerns that it has about complexities and timing of approvals (particularly for Scenario 1, where approvals for the Norfolk Vanguard OWF substations would also be a consideration) where consenting could take place with details still to be finalised (NPS EN-1, para 4.2.9). In the ExA's opinion it would also give more certainty to a strategic design approach that would be sensitive to place and demonstrate good aesthetics as far as possible (NPS EN-1, para 4.5.1).
- 5.3.203. The ExA considers this would help to ensure that it would demonstrate good design in terms of siting relative to existing landscape character, landform and vegetation and the sensitive use of materials, taking account of both functionality and aesthetics (NPS EN-1, para 4.5.3). Even so, this is not assured; and the ExA recommends that the SoS pays particular attention as to what mechanisms, such as the Co-operation Agreement between the Applicant and Norfolk Vanguard OWF, could be put in place in the Necton area to give more certainty that the requirements of NPS EN-1, Section 4.5 and EN-3, Section 2.4 can be met.
- 5.3.204. Balancing functionality with aesthetics (NPS EN-1, para 4.5.3) would need to be part of the design process, in which the respective roles of all parties that would be engaged (Applicant, local authorities, landowners and the local community) would be clear, so that all parties could work collaboratively to achieve high quality inclusive design.
- 5.3.205. The ExA is satisfied that the Applicant explained its strategic design approach with reasons and how this led to the embedded project mitigation (NPS EN-1, para 4.5.4). The ExA is also satisfied that elsewhere, other than at the proposed substations, in terms of siting and

use of appropriate technologies, the policy objectives have been met (NPS EN-1, para 4.5.2).

- 5.3.206. Taking all matters reported into consideration and bearing in mind there would be many post-consent decisions still to be made which could influence the final aesthetics of the proposed substations, the ExA ascribes little weight against the Order being made to matters of good design. This is predicated on the ExA's recommended addition of an early independent design review secured in the rDCO. Without this, the weight against the Order being made would be greater for the reasons set out above.

Open Space and Green Infrastructure

- 5.3.207. The ExA considers that there is no requirement for the application to consider the provision of new or additional open space because there is no loss of open space or sustained adverse effect on public access (NPS EN-1, para 5.10.6 and 5.10.24).
- 5.3.208. The ExA is content that the mitigation planting and other matters relating to its multifunctionality, as described in the OLEMS and secured in the LMS in R18 and R19 and the EcoMP in R24 of the rDCO, would deliver green infrastructure, which would ensure as far as possible (in the context of the proposed footprints of the substations which would fragment biodiversity networks), that connectivity would be maintained in the vicinity of the Proposed Development (NPS EN-1, para 5.10.20) and new green infrastructure would be provided (NPS EN-1, para 5.10.6). The ExA acknowledges the enhancement which would be delivered through improved connectivity to species-poor existing hedgerows near the substations. The ExA is content that the OLEMS and mitigation planting plans which form part of the rDCO is secured (NPS EN-1, para 5.10.21).
- 5.3.209. As with landscape and visual matters and good design, the role of the local authorities in the discharge of requirements and ongoing monitoring would be key to ensuring that the green infrastructure policy objectives would be met. In this regard the SoS may wish to satisfy themselves that a PPA would be in place. Taking all the matters reported above into consideration, including fragmentation in some areas and enhancement elsewhere, the ExA concludes that open space and green infrastructure matters do not weigh against the Order being made.

5.4. ONSHORE CONSTRUCTION EFFECTS

Background and policy context

Introduction

- 5.4.1. In the Initial Assessment of the Principal Issues, the ExA identified onshore construction effects including effects from dust and exhaust emissions of the Proposed Development as a principal issue [PD-006].

This Section considers the effects of pre-construction, construction, operation, and decommissioning of the onshore elements of the Proposed Development. The effects of noise and vibration have been discussed in Section 5.5 of this Recommendation Report. Air quality effects on Biodiversity are covered in Section 5.6.

National Policy Statements

- 5.4.2. During the construction, operation and decommissioning of energy infrastructure, NPS EN-1 requires the Applicant to assess:
- a. environmental, social and economic effects (NSP EN-1, para 4.2.3)
 - b. the potential for insect infestation and emissions of odour, dust, steam, smoke and artificial light to have a detrimental impact on amenity (NPS EN-1, para 5.6.4); and
 - c. any significant air emissions, their mitigation and any residual significant emissions from any road traffic generated by the project (NPS EN-1, 5.2.7); and
 - d. identify the impacts of land-based traffic and transport and noise and proposals for their avoidance or mitigation (NPS EN-3).
- 5.4.3. In reaching a decision the SoS should:
- a. be satisfied that an assessment of construction effects, such as from artificial light and dust has been carried out and that all reasonable steps have been taken, and would be taken to minimise any such detrimental impacts (NPS EN-1, Para 5.6.7);
 - b. give air quality considerations substantial weight where a project would lead to a deterioration in air quality, even if this does not lead to any breaches of national air quality limits (NPS EN-1, Para 5.2.9);
 - c. consider whether mitigation measures would be needed both for operational and construction emissions, through a construction management plan and measures to mitigate air emissions from transport (NPS EN-1, paras 5.2.11, 5.2.13);
 - d. be aware of the effects of the cable if the route for the cable from the wind farm to the onshore substation is known (NPS EN-3, para 2.6.37).

Other legislation and policies

- 5.4.4. The legislation and guidance relevant to onshore construction effects discussed in this Section, are set out in the ES Chapter 26 [APP-239, Section 26.2], the national, regional and local planning policies are in the Planning Statement [APP-693] and the ES [APP-216]. Key legislation and policy are identified in Chapter 3 of this Recommendation Report.

The application

Application material

- 5.4.5. The aspects of onshore construction effects discussed in this Section have been described in the ES Chapter 5 Project Description [APP-218]. Matters relating to the potential Air Quality effects and the associated

mitigation for the construction and decommissioning of the onshore elements of both Scenario 1 and Scenario 2 of the Proposed Development are discussed in Chapter 26 Air Quality [APP-239]. Some matters discussed in this Section have been covered in ES Chapter 24 Traffic and Transport [APP-237], Chapter 25 Noise and Vibration [APP-238], and Chapter 29 Landscape and Visual Impact Assessment [APP-242].

- 5.4.6. Related documents that provide relevant details for construction activities and the proposed mitigations are:
- a. Outline Code of Construction Practice [REP18-020];
 - b. Outline Landscape and Ecological Management Strategy [REP14-021];
 - c. Schedule of Mitigation [REP18-018]; and
 - d. ES Figures 5.3 to 5.6 [APP-267 to APP-270].

Environmental Statement

- 5.4.7. Under Scenario 1 Norfolk Vanguard OWF would have already undertaken construction activity, including installation of ducts to house cables for the Proposed Development, A47 junction works and installation of a shared access road up to the substation, and overhead line modifications at the Necton National Grid substation. In Scenario 2, the Proposed Development would proceed to construction first, and would be responsible for implementing all elements [APP-218, Section 5.5], [APP-267] and [APP-268].
- 5.4.8. The landfall location would be at Happisburgh South and would comprise 0.25km stretch of coastline. It would extend approximately 500m inland taking account of natural coastal erosion risk. The main construction activities at the landfall for both scenarios would include landfall compounds, cable duct installation via Horizontal Directional Drilling (HDD) transition pits and link boxes and cable pulling.
- 5.4.9. The onshore cable route would be 45m wide from Happisburgh South, to the onshore project substation near Necton. The construction elements required in Scenario 1 are cable pulling, accesses, cable logistics area, jointing pits and link boxes. In addition, Scenario 2 would include cable duct installation, cable duct crossings, trenchless crossings, and mobilisation areas.
- 5.4.10. The onshore project substation would consist of an HVDC substation, including up to two similar converter stations, located within the single onshore project substation footprint. In Scenario 1, the construction activities required would include access road to onshore project substation and construction of onshore project substation. In addition, Scenario 2 would require A47 junction improvement and screening.
- 5.4.11. The existing Necton National Grid substation would require an extension to accommodate the connection points for the Proposed Development. The extension would be in the easterly direction for Scenario 1 and

westerly direction for Scenario 2. Overhead line modifications would be required for Scenario 2 only.

- 5.4.12. Onshore operational phase effects on Air Quality were scoped out of the assessment, as this would be limited to operational phase traffic movements, which are anticipated to be negligible [APP-239]. The Applicant carried out an assessment of potential adverse effects associated with construction phase dust and fine particulate matter emissions, and construction vehicle exhaust emissions at human and ecological receptors.

Mitigation proposed

- 5.4.13. The Applicant has proposed two different types of mitigation for construction effects:
- a. Embedded mitigation measures that are common across the project are set out in Section 5.1.
 - b. Standard mitigation for construction effects would comprise:
 - activities and measures secured through the CoCP in R20;
 - Landscaping Management Scheme secured through R18 and Ecological Management Strategy secured through R24;
 - best-practice mitigation measures included in the draft Air Quality Management Plan (AQMP) as part of the CoCP secured through R20; and
 - Mitigation for the construction effects related to Traffic and Transport are discussed in Section 5.2 of this Recommendation Report.

Local Impact Reports

- 5.4.14. Local Impact Reports were submitted at D2 by Breckland Council [REP2-062], Broadland DC [REP2-065], NNDC [REP2-087] and NCC [REP2-085].
- 5.4.15. Norfolk County Council delegated detailed matters relating to construction noise to the relevant District Councils and therefore, did not raise any concerns.
- 5.4.16. NNDC considered that Requirement 20 – Code of Construction Practice and Requirement 26 – Construction Hours in the dDCO would provide an effective way to help to minimise any adverse impacts of noise and vibration during the construction phase.
- 5.4.17. Broadland DC raised a concern regarding the onshore cumulative effects of construction traffic, including on air quality, associated with the Proposed Development, the proposed Norfolk Vanguard OWF, the Hornsea Project Three OWF on the villages of Oulton and Cawston, and the surrounding areas. Broadland DC's concerns also relate to cumulative adverse effects of the construction traffic, noise and vibration, and cable corridors crossing north of Reepham. These issues have been discussed in Sections 5.3, 5.5 and 5.8 of this Chapter.

- 5.4.18. Breckland Council states that the maximum sizes for the temporary compounds (mobilisation areas and their compounds and the cable logistics area) should be captured in the DCO.

Issues

Pre-commencement work

- 5.4.19. The Applicant states that the scope of the OCoCP includes the management measures that contractors would be required to adopt and implement for the Proposed Development and related off-site activities. The works and locations within the scope of this document would include site preparation works, infrastructure construction, and commissioning phases of the project for onshore works [REP18-019, Section 1.5].
- 5.4.20. The ExA was concerned that the OCoCP did not cover pre-commencement work, which was covered in the dDCO R20(4). The ExA sought further clarification to understand the proposals for controlling and managing these activities in written questions [PD-008, Q5.3.7] [PD-009, Q2.5.3.9] and at ISH3 [EV6-001 to EV6-006].
- 5.4.21. The Applicant responded that pre-commencement works would be undertaken prior to the production of the final management plans. Each pre-commencement activity would require a specific plan that would be produced in accordance with the relevant outline management document and would be submitted to and approved by the relevant planning authority. The plans would be developed post-consent when the details of the types and timings of pre-commencement works were known. The plans would be submitted to the relevant planning authority based on the proposed area of works, with each planning authority providing approval for works in their authority. Because the plans would be produced in advance of the detailed management plans, they would be stand-alone documents separate to the final management plans [REP1-041, Pages 31, 32] [REP4-018] [REP5-045].
- 5.4.22. Pre-commencement work would be managed via the following specific requirements in the dDCO:
- a. R20(4) Code of Construction Practice - Pre-commencement screening, fencing and site security works plan;
 - b. R21(3) Traffic – Pre-commencement access management plan to enable archaeological investigations;
 - c. R23(4) Archaeology Written Scheme of Investigation – Written scheme of archaeological investigation works; and
 - d. R24(3) Ecological Management Plan – Ecological management plan for site clearance works.
- 5.4.23. The Applicant updated the note on requirements and conditions in the DCO to include a diagram illustrating how Management Plans and Pre-commencement Plans would interrelate and correspond to Requirements [REP18-014, Annex 1], included in Section 5.1.

- 5.4.24. The ExA notes that none of the relevant planning authorities raised any concerns about their role in the discharge of pre-commencement requirements. The ExA is content that the scope of pre-commencement works and the approvals process from relevant planning authorities is secured within the rDCO: R20(4) for site security, R21(3) for early access for archaeological investigations, R23(4) for archaeological surveys and R24(3) for site ecological and landscape aspects of site clearance.
- 5.4.25. The ExA found the diagram added to the Note on Requirements and Conditions helpful [REP18-014, Annex 1]. If consented, the ExA encourages parties involved in post-consent approvals to adopt use of the onshore part of this document.

Onshore cable corridor width

- 5.4.26. The OCoCP [REP18-019] sets out the definition of onshore cable route in the glossary of terminology which specifies that the onshore cable route would be up to 35m working width within a 45m wide corridor. The ExA asked the Applicant for justification for the proposed cable corridor width.
- 5.4.27. In response the Applicant stated that 35m width was required for cable corridor construction requirements and an additional 10m for micro-siting [REP2-021, Q12.0.3]. A temporary haul road (described as a 'running track' in this application) is included within the cable corridor. The construction requirements within the cable corridor would include land to store stripped topsoil, separate land to store excavated subsoil, up to two trenches, a running track for access and delivery of materials to the excavation site and temporary perimeter fencing. The construction requirements are also set out in the ES [APP-218, Section 5.7.2, Plate 5.15].
- 5.4.28. The ExA sought further clarification about when the running track would be removed in both scenarios. The Applicant explained that in Scenario 2, the running track would be removed when the duct installation for a cable route section which the running track was supporting had been completed. For both scenarios, all running track, including any short sections of running track required to be temporarily reinstated for cable pulling would be removed once the cable has been pulled [REP5-045, Q2.12.0.4].
- 5.4.29. The ExA notes that no IPs raised concerns about the onshore cable corridor width. The ExA accepts the Applicant's justification for the 35m working width within a 45m wide corridor. The OCoCP, secured through the rDCO R20, defines the cable corridor width as explained here. With these measures in place the ExA is content with the arrangements for the onshore cable corridor.

Cable Duct Installation Workfront Strategy

- 5.4.30. The Applicant has proposed an onshore cable duct installation strategy, which proposes that construction teams would work on short lengths of the cable corridor (approximately 150m per section) in turn, and each length would be backfilled after laying of cable ducts before the next

section would be started [APP-218, paras 422, 423]. The 150m length of onshore cable route within which duct installation works would occur has been referred to as the workfront in the glossary of terminology [APP-218, Table 5.1].

- 5.4.31. The ExA was concerned if the implications of deviating from the cable duct installation strategy had been assessed in the ES and asked the reasons for the flexibility afforded to the proposed strategy by the language “*where possible*” in the OLEMS. The Applicant stated that the flexibility is needed for instances when the 150m length would be considered to not be the most appropriate length, and would need to differ to maintain the principle of the mitigation (excavate, install and reinstate within a 1-2 week period). The Applicant explained that the assumptions for the worst case that is assessed in the ES, were that workfronts could be longer than 150m in some instances, and may not be reinstated immediately, but that works would not extend beyond two weeks at each location [REP2-021, Q2.2.1], [REP5-045, Q2.12.0.1] and [REP7-017, Q3.12.0.1].
- 5.4.32. The Applicant explained that the cable duct installation strategy is a part of the project-wide mitigation embedded (excavate, install and reinstate within a 1 to 2 week period) and has been used within the impact assessment presented in several ES Chapters. The 150m workfront is secured by being detailed in the OLEMS, which would be finalised post consent, secured under R24 of the dDCO [REP2-021, Q12.0.1]. The Applicant subsequently included the reason for flexibility in the workfront length to the OLEMS to clarify that the cable duct installation strategy would apply at all times, however the length of the workfront could differ from 150m during the construction process to maintain the principle of mitigation (excavate, install and reinstate within a 1 to 2 week period) [REP14-022, Table 4.1, Page 10].
- 5.4.33. The ExA notes that no other IPs raised any concerns about the cable duct installation strategy, proposed length of the workfronts, and the flexibility needed in the workfront length.
- 5.4.34. The ExA accepts the Applicant’s justification that the use of the sectionalised approach to duct installation would minimise the amount of land being worked on at any one time, and thereby limit the adverse effects of construction of the cable route to only a limited area at any given time. The ExA also accepts that there would be a need for flexibility in adhering to the 150m length of workfront to respond to conditions on the ground that emerge during construction.
- 5.4.35. The ExA notes that the cable duct installation strategy is part of the embedded mitigation that is common across the Proposed Development and is therefore content that related construction effects have been taken on board in the EIA. Overall, the ExA agrees with the Applicant’s assessment that the construction effects specific to the installation of the ducts would not be significant. The ExA is satisfied that the workfront strategy is secured by being detailed in the OLEMS, which would be finalised post consent, secured under R24 of the rDCO.

Visual effects of Mobilisation Areas (MA)

- 5.4.36. Mobilisation areas (MA) would be required for construction compounds and to store equipment, located adjacent to the onshore cable route, accessible from the local highways network and suitable for deliveries. MAs would be a maximum of 100m x 100m on their own, or 150m x 100m if combined with a trenchless crossing compound [APP-218, Section 5.7.2.5.1].
- 5.4.37. The ExA was not convinced that the measures in the OCoCP would mitigate adverse construction effects on visual and other amenity for sensitive receptors in proximity to MAs. NNDC suggested that while some of these issues could be addressed through the OCoCP, details of height and colour of construction compounds should be covered by a Requirement in the dDCO [REP6-043, Appendix A, Q2.12.1.3]. As indicated above, Breckland Council felt that maximum sizes for the MAs should be captured in the DCO [REP2-062].
- 5.4.38. The Applicant proposed changes to the OCoCP and the OLEMS to give more certainty to the height, footprint and approvals process. The OCoCP already included a provision that the final CoCP would include a site layout showing the location of MAs and other temporary construction compounds. The Applicant added further provisions, so that the layout plan would be designed to minimise effects on sensitive receptors in proximity to MAs. In addition, site-specific control measures would be identified when further details of the construction activities were available post-consent to ensure the most appropriate mitigation, such as a 3m height restriction for temporary storage units [REP7-016, Pages 16 to 17] and [REP18-020, Section 3.2.1]. The Applicant updated the OLEMS to link its OCoCP commitment to the reinstatement of all temporary construction areas, including the MAs as soon as is reasonably practicable [REP18-020, para 83] and [REP14-020, Page 16].
- 5.4.39. In addition to the changes to the OCoCP and OLEMS, the Applicant also proposed changes to the dDCO to ensure the control measures and approvals processes are secured. The OCoCP states that the site-specific control measures would be included in the Construction Method Statement, which under R20(2)(g) would be subject to approval by the relevant local planning authority as part of the Construction Method Statement. The Applicant made an addition to the dDCO at R16(15), which set out maximum parameters for the footprints of MAs. The ExA also notes that pre-commencement screening and site security works would be subject to approval of a specific plan under R(20)(4).

ExA's reasoning

- 5.4.40. NNDC confirmed that it was content with the additional wording that the Applicant has added to the OCoCP [REP7-072, Q3.12.1.1]. The ExA is satisfied that the rDCO now has sufficient measures secured to ensure that the approach to detailing each of the MAs would be set out for submission to and approval by the relevant planning authority, and that appropriate parameters are secured in the rDCO, as requested by Breckland Council. It would be for those relevant planning authorities to

satisfy themselves that the details submitted meet the criteria and parameters set out.

- 5.4.41. The ExA welcomes the addition which the Applicant made to the dDCO by including R6(15) in connection with temporary works areas generally which covers MAs. The ExA also welcomes the additions to the OCoCP and to the OLEMS, which provide more details and parameters against which the relevant planning authorities would assess pre-commencement submissions.

Access arrangements and location of MA2, MA5b and MA11

MA2

- 5.4.42. In WQ2 the ExA pursued concerns about the access arrangements for MA2 based on what it had observed on a USI. The Applicant stated that details of the access arrangements for MA2 are included in the OTMP [REP2-021, Q12.1.1]. The ExA notes that the OTMP includes specific upgrading of the junction and the access arrangements for this access point (AC159) [REP18-021, Section 4.4.1]. Since AC159 is an access off the A47 it has been agreed with Highways England (HE) as part of the A47 Cable Crossing Access Technical Note (CCATN) [REP16-008, Appendix 2].
- 5.4.43. The ExA notes that the approaches set out in the CCATN are agreed to the satisfaction of HE, noted in the final SoCG [REP16-008]. The ExA is satisfied with the access arrangement for MA2 set out in the OTMP [REP18-021, Section 4.4.1] and in the CCATN [REP16-008, Appendix 2].

MA5b

- 5.4.44. The ExA asked for justification of the location of MA5b on the edge of the settlement of Sparham, in particular with regards to the proximity to the properties on Well Lane. The Applicant argued that proximity to residents was unavoidable, due to the need to accommodate the other criteria of embedded mitigation and that assessment of adverse effects on properties on Well Lane (including, noise and air quality) concluded negligible adverse effects for sensitive receptors with standard mitigation [REP2-021, Q12.1.1].
- 5.4.45. The ExA is satisfied that with the additional measures for post-consent, pre-commencement approvals as described above in relation to MA2 that the relevant planning authority would be able to control layout and mitigation at MA5b.

MA11

- 5.4.46. One IP raised concerns about the lighting of MA11 [RR-053] on Happisburgh Road east of Ridlington. The IP was also concerned about the location of MA11, to reduce the effects on the Happisburgh Road which would not be suited to 2-way HGV traffic.
- 5.4.47. The Applicant explained that the location of MA11 had been driven by NCC's (local highway authority) requirement to avoid an access in close

proximity to the existing crossroads, and to avoid siting the zone any closer to residences on the north [REP2-021, Q12.1.1]. The mobile traffic management (pilot vehicles) would control low HGV demand on lightly trafficked narrow roads as set out in the OTMP [REP18-021, Section 4.1] with final pilot control routes confirmed in the TMP secured in R21 of the rDCO.

- 5.4.48. The ExA notes that the Applicant's HGV traffic projected for Link 67, Happisburgh Road is assessed as not significant [REP18-021, Section 4.1, Table 4.1]. No other concerns were raised by IPs and NCC. The ExA is persuaded by the Applicant's justification for the location of MA11. The ExA is content that the proposed strategy of mobile traffic management (pilot vehicles) would adequately mitigate the effects of low HGV movement on Happisburgh Road, and is secured in the OTMP and R21 of the rDCO.
- 5.4.49. Regarding site lighting, the Applicant highlighted its commitment to producing an Artificial Light Emissions Management Plan (ALEMP) for approval by the local authorities prior to construction secured under R20(2)(c) of the dDCO [REP18-009]. This plan would detail the mitigation measures to address concerns raised regarding ALEMP disturbance to nearby residences and wildlife. The ExA is satisfied that the ALEMP in the final CoCP, secured through R21 provides adequate controls for lighting levels for construction stage. Effects of lighting at the proposed onshore substations are reported in Section 5.3.

Open Cut Trench or Trenchless Crossing at the B1149

- 5.4.50. Locations where trenchless crossings would be required are listed in the dDCO at R16(13), and in Schedule 6 Part 2. At the outset of the Examination, the location where the cable corridor would cross the B1149, north east of Cawston and south of the junction with The Street to Oulton, was not a trenchless crossing location.
- 5.4.51. From the start of the Examination, there was disagreement between the Applicant and NCC over whether this location required a trenchless crossing, when considered cumulatively [REP2-050, Table 6, Page 25]. NCC's concerns related to 1.2m safety zone to accommodate a large volume of abnormal loads delivering cable drums to the Hornsea Project Three OWF main compound at Oulton. NCC stated that the Applicant's method of working would not be safe because the verge on one side of the road is too narrow and would not accommodate the 1.2 m safety zone related to the potential for trench shoring and consideration for ground conditions and angle of repose in the soil [REP2-050]. The Applicant responded with a revised design for an open cut trench which included a 1.5 m safety zone within the current order limits [REP8-029, Appendix 3]. NCC noted at D10, that the Applicant accepted that it would be possible to provide a trenchless crossing using HDD method within the current Order limits, and reiterated its view that an open cut trench at this location would not be appropriate [REP10-050, Q4.12.01].
- 5.4.52. Broadland DC stated that the open cut trench and the diversion lane would have an adverse effect on natural environment, and for that

reason as well as on grounds of safety the crossing should be trenchless, [REP7-017, Q3.5.3.8]. The Applicant responded that the adverse landscape and visual effects would be short-term and not significant using micro-siting to avoid trees [REP8-015, Q3.5.3.8].

- 5.4.53. The Applicant had set out, as requested on a without prejudice basis, the changes which would be required to the dDCO should the SoS be minded to include a trenchless crossing at the B1149 [REP7-017, Q3.5.3.7].
- 5.4.54. Following the SoS's decision and made Order for Norfolk Vanguard OWF, which includes the B1149 in the list of trenchless crossings and other related changes; the Applicant made corresponding amendments to the dDCO [REP18-009]. These comprised an addition to R16(13)(t) to include a trenchless crossing at the B1149, only in the event of Hornsea Project Three OWF being consented and its development commencing. The Applicant stated that it may be necessary to cross plot 19/05 for a trenchless crossing. The B1149 is already included in Schedule 6, Part 2, Scenario 2 under the section of 'Minor crossings inc. highway' but is now also included under the section of 'Minor crossings inc. highway required to be undertaken by trenchless crossing'. Also a new Works Plan was included to locate the additional trenchless crossing, on which reference to R16(13)(t) is made [REP14-003, Sheet 19 of 42].
- 5.4.55. The ExA notes the positions of NCC and the Applicant in the final SoCG under topics on cumulative impacts of the B1149 and under DCO wording of requirements [REP16-012, pages 33 to 35, 38]. In terms of effects of cumulative traffic, NCC notes that the Applicant has conceded that there would be driver delay due to single traffic flow, which NCC states would be on the cusp of acceptability. NCC also disagrees with the Applicant's approach for open cut trench because of long term maintenance liability with the potential for weakening surface construction and risk of carriageway failure. The Applicant's proposed timeframe for a detailed construction method statement via the CoCP would be too late for further consideration by NCC and also on safety grounds (a point made strongly from the outset by NCC). These points are not agreed by the Applicant.
- 5.4.56. The ExA has decided to include the crossing of the B1149 as a trenchless crossing for Scenario 2 in the rDCO. The ExA finds that NCC's concerns on safety and risk of carriageway failure are not specifically related to cumulative effects with traffic from Hornsea Project Three OWF. The ExA has therefore removed from R16(13)(t) all reference to the Hornsea Project Three OWF Order being made and its development commencing.
- 5.4.57. Taking all these matters together, the ExA considers that a trenchless crossing should be secured at this location under Scenario 2 irrespective of the outcome and timescale for Hornsea Project Three OWF. The ExA has therefore removed all wording in R16(13)(t) in the rDCO apart from "*B1149 (Work No. 6)*", which now reflects that provided by the Applicant on a without prejudice basis, referred to earlier. It does not necessitate any changes to the Land Plans. It does require the removal of Plot 19/05 from Schedule 6, Part 2, Scenario 2 "*Minor crossings inc. highways*" (as set out by the Applicant on a without prejudice basis) because there

would not be a situation where a crossing that was not trenchless would require this plot. It also requires an addition to Schedule 8, to include Plot 19/05, the omission of which the ExA considers is an oversight on the part of the Applicant in its dDCO. These changes have been made to the rDCO.

- 5.4.58. Should the SoS disagree with the deleted reference to Hornsea Project Three OWF from R16(13)(t), the ExA can confirm that the deleted wording can be added back into the requirement to adopt the wording in the Applicant's final dDCO drafting. The SoS would not need to remove the added Plot 19/05 from Schedule 8, but would need to add Plot 19/05 back into Schedule 6, Part 2, Scenario 2, "*Minor crossings inc. highways*".

Open Cut Trench or Trenchless Crossing at Church Road, Colby

- 5.4.59. Until D10 of the Examination, there was a difference of opinion between the Applicant and NNDC over whether a trenchless crossing would be needed at Church Road, Colby under Scenario 2 [REP2-087, para 13.17 to 13.20 and Appendix F].
- 5.4.60. The Applicant responded to the ExA's questions and NNDC's request for a trenchless crossing to address adverse landscape and visual effects arising from an open cut approach through the submission of a Position Statement [REP7-035]. This provided further detail in respect of numbers and quality of trees and proposed additional text to be included in the OLEMS, capturing the commitment to micro-siting and to replacement planting nearby with no net loss [REP8-005, Section 9.1.3]. This resulted in NNDC withdrawing its request for a trenchless crossing [REP10-051, Q3.12.0.3].
- 5.4.61. The ExA agrees with the position reached between the parties over an open cut trench approach at Church Road, Colby for Scenario 2. The mitigation, which would include micro-siting, resulting in no net loss of trees, is now secured in the OLEMS. Therefore, the ExA is content with the drafting in the rDCO.

Effects of construction traffic on air quality in Cawston and Oulton

- 5.4.62. To control construction dust and fine particulate matter for both Scenario 1 and Scenario 2, the Applicant's proposed mitigation measures would include minimising the production and transmission of dust from construction activities, and the requirement to carry out visual on-site and off-site inspections of dust deposition levels [APP-239, Para 135, 136, 137], secured through the CoCP R20 in the rDCO. With the implementation of the mitigation measures, dust impacts can be considered to be not significant and cumulative impacts with other relevant projects are also assessed as being not significant.
- 5.4.63. The Applicant's air quality assessment finds that construction vehicle exhaust emissions for human receptors indicate that annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} are predicted to be below the respective Air Quality Objectives in the year of peak construction (2024)

under Scenario 1 and 2, both 'without' and 'with' the Proposed Development [APP-239, Para 140].

- 5.4.64. Concerns were raised by Cawston PC in its response to ExA WQ1 [REP2-067] regarding the effects on residents from poor air quality arising from large numbers of diesel vehicles trying to negotiate the village centre and stated that this has not been adequately assessed. Initially Broadland DC stated in the first SoCG, that as NCC highways had not agreed the mitigation proposals, it was not possible to confirm the adverse air quality effects on residents and businesses on High Street [REP2-047, Page 14].
- 5.4.65. The Applicant reiterated the findings in the ES that the air quality assessment considered two receptor locations in Cawston (identified by reference numbers R17 and R18) adjacent to the B1145 Aylsham Road, where the impact of development-generated traffic, including cumulative flows with Hornsea Project Three OWF is considered. The assessment highlights that pollutant concentrations, without and with the Proposed Development, would be well below the relevant air quality objectives for NO₂, PM₁₀ and PM_{2.5}, and in line with World Health Organisation annual mean air quality standard, the Government's Clean Air Strategy, Institute of Air Quality Management (IAQM) guidance and Environmental Protection UK (EPUK) guidance [REP3-003].
- 5.4.66. At D8, the Applicant submitted a clarification note [REP8-028] providing assessment on the potential noise, vibration and air quality effects of road traffic as a result of the proposed Revised Highway Intervention Scheme (HIS) [REP5-025]. More information on the revised HIS has been reported in Section 5.2 of this Recommendation Report. The assessment concludes that during working hours the HGV conflict areas would give rise to idling vehicles along the B1145 as a result of the revised HIS. Additional receptors were added on the B1145 to consider effects at locations adjacent to potentially idling vehicles. The Applicant states that although the revised HIS would give rise to additional emissions and associated pollutant concentrations at receptors, it would not lead to the exceedance of the Air Quality Objectives, or significant adverse air quality effects. Subsequently, Broadland DC confirmed that the air quality effects as outlined in the clarification note would be acceptable in Cawston [REP10-036].
- 5.4.67. Oulton PC highlighted [REP2-094] that Link 68 and Link 75 are missing from air quality assessments and maps for Scenarios 1 and 2, raising concerns about the residential property (Old Railway Gatehouse) within two metres of Link 68 being exposed to increase in emissions from cumulative construction traffic. Broadland DC was concerned that the submitted air quality assessment, especially near Old Railway gatehouse, does not take full account of the existing baseline air quality [REP2-047, Page 12].
- 5.4.68. In response the Applicant states [REP3-003] that the cumulative increase in traffic movements on Links 68 and 75 from the Proposed Development and Hornsea Project Three OWF are below the IAQM and the EPUK

screening criteria, and therefore air quality impacts are considered to be insignificant, and in accordance with the guidance not required to be included in the air quality assessment. While Link 68 and Link 75 are not included in the detailed assessment, a further modelling study was carried out, principally at the Old Railway Gatehouse, to determine the potential effect of queuing traffic on Link 68 [REP2-047]. The results show that air quality impacts would be negligible, in accordance with IAQM and EPUK guidance, and that pollutant concentrations would be well below the respective Objectives.

5.4.69. The matter was agreed with Broadland DC in the final SoCG, which confirms its position that the OTMP secured through dDCO R21 would provide sufficient mitigation for adverse effects to air quality arising from construction traffic at the Street in Oulton [REP10-036].

5.4.70. The ExA notes the concerns relating to emissions from construction traffic in Cawston and Oulton. However, the assessment methodology, findings and approach to mitigation were subsequently agreed by Broadland DC [REP10-036]. The ExA is persuaded by the evidence submitted by the Applicant and concludes that the emissions from construction vehicles would be in line with the respective Air Quality objectives. The ExA also accepts the Applicant's assessment that construction dust and fine particulate matter would be controlled by the proposed mitigation in the AQMP in the CoCP secured through R20.

Cumulative effects of construction traffic on air quality

5.4.71. The Applicant has assessed the potential direct cumulative effects for Scenario 1 with Norfolk Vanguard OWF and Hornsea Project Three OWF, and for Scenario 2 with Hornsea Project Three OWF. The Applicant states that there would not be significant cumulative adverse effects associated with construction phase dust emissions, and peak construction traffic associated with the construction and decommissioning phases for Scenarios 1 and 2 [APP-239, Section 26.8].

5.4.72. Issues considered during the Examination were cumulative effects of construction traffic on air quality in Cawston and Oulton, and the ExA is satisfied with the Applicant's assessment.

Decommissioning

5.4.73. While no decision has been made regarding the final decommissioning policy for the project, it is likely the cables would be pulled through the ducts and removed, with the ducts themselves left in situ. As such, the Applicant states that there would be no significant effects for any receptor upon decommissioning at the landfall or along the onshore cable route [APP-239, Para 156]. The ExA accepts the Applicant's assessment.

Conclusions

5.4.74. The ExA considers that matters raised during the Examination regarding pre-commencement works, the onshore cable corridor width, the cable duct installation strategy, the mobilisation areas, open cut trench or

trenchless crossing at Church Road, Colby, and construction traffic effects on air quality in Cawston and Oulton have been satisfactorily resolved. The ExA highlights that a trenchless crossing has been secured at B1149 in the rDCO, through changes in R16(13)(t), Schedule 6, and Schedule 8. The ExA is content that relevant mitigation, including the AQMP, are secured through R20 CoCP, R21 OTMP, R18 Landscaping Management Scheme and R24 Ecological Management Strategy in the rDCO.

- 5.4.75. The ExA is content that with regard to the onshore construction effects discussed here, the Applicant's assessment and proposed mitigation has satisfactorily met the policy requirements set out in NSP EN-1 paras 4.2.3, 5.6.4, 5.2.7 and NPS EN-3. The ExA concludes that the Proposed Development would meet the policy requirements of NPS EN-1, paras 5.6.7, 5.2.9, 5.2.11, 5.2.13, and NPS EN-3, para 2.6.37. With regard to the onshore construction effects discussed here, the ExA attributes little weight against the making of the Order.
- 5.4.76. The ExA notes that there would be a reliance on post-consent approvals by the relevant local authorities in order for management plans to secure and deliver the required mitigation. The ExA notes the absence of Planning Performance Agreements (PPA), which cannot be secured within the scope of the Examination. As such, the ExA highlights to the SoS that post consent approvals are numerous and complex, and measures would need to be in place that ensure the relevant local authorities have the right skills and resources to handle the submissions and approvals adequately within the timescales set.
- 5.4.77. The ExA considers that construction effects have also been discussed in various parts of this Recommendation Report, to cover matters relating to construction traffic, visual effects, noise and vibration, water resources and flood risk, land use and agriculture, and physical and mental health. Taking into account the totality of adverse effects of construction activities, the ExA attributes medium weight against the making of the Order.

5.5. NOISE AND VIBRATION

Background and policy context

Introduction

- 5.5.1. The ExA's initial assessment of principal issues [PD-006] identified effects of noise and vibration as a matter of consideration under onshore construction effects. This section considers the noise and vibration effects and associated mitigation for the construction, operation and decommissioning of the Proposed Development. Noise effects on terrestrial biodiversity and ecology have been assessed in Section 5.6, and in relation to marine biodiversity and ecology are discussed in Section 5.9.

National Policy Statements

- 5.5.2. The assessment for noise and vibration as set out in NPS EN-1, requires from the Applicant:
- a. the identification of noise sensitive areas that may be affected, description of the noise generating aspects of the development, the changes in the noise environment day-to-day and over the course of the proposed development, and measures to be employed in mitigating noise (NPS EN-1, para 5.11.4);
 - b. mitigating the adverse effects of noise with the use of good design and appropriate technologies (NPS EN-1, Para 4.5.2); and
 - c. assessment of operational noise with respect to human receptors using the principles of the relevant British Standards and other guidance (NPS EN-1, Para 5.11.6).
- 5.5.3. In reaching a decision the SoS should be satisfied that:
- a. the Proposed Development demonstrates good design through suitable selection of plant, containment of noise within buildings, optimisation of plant layout, and the use of landscaping, bunds or noise barriers (NPS EN-1, Para 5.11.8);
 - b. significant adverse impacts relating to noise are avoided, mitigated and minimised (NPS EN-1, Para 5.11.9);
 - c. mitigation measures using engineering solutions, layout and good design, and administrative methods and restricting activities are adequate (NPS EN-1, Para 5.11.11); and
 - d. if further noise mitigation is required through improved sound insulation to dwellings (NPS EN-1, Para 5.11.13).

Other legislation and policies

- 5.5.4. The legislation and guidance relevant to Noise and Vibration is set out in the ES Chapter 25 [APP-238, Section 24.2]. Key legislation and policies are identified in Chapter 3 of the ES [APP-216]. The Applicant's Planning Statement sets out the national, regional and local planning policies that are considered relevant to the Proposed Development [APP-693].

The application

Application material

- 5.5.5. The ES provided an overview of the potential airborne noise and vibration effects and the associated mitigation for the construction, operation and decommissioning of the onshore elements of both Scenario 1 and Scenario 2 of the Proposed Development, in Chapter 25 Noise and Vibration [APP-238].
- 5.5.6. Related documents that provide relevant details for development activities and the proposed mitigations include, the Outline Code of Construction Practice [REP18-019]. The ES chapters and related documents are supported by figures [APP-469] to [APP-470] and appendices [APP-657] to [APP-660].

- 5.5.7. Potential effects in relation to noise and vibration inter-relate with a number of other areas covered in different parts of this Recommendation Report, and cross-referenced where relevant, in particular Traffic and Transport in Section 5.2.

Environmental Statement

- 5.5.8. The potential noise effects during construction in Scenario 1 include those arising from: landfall, the cable pulling through pre-installed ducts, construction of onshore project substation and extension to National Grid substation [APP-218, Table 5.32] and [APP-238, 25.8.5.3]. Scenario 2 is considered to present the worst case and the Applicant has assessed the potential effects during construction in the following areas [APP-238, Section 25.8.5.1]:
- a. Daytime noise – Landfall, Onshore cable route, and the Onshore project substation and National Grid substation extension;
 - b. Evening and Weekends – Landfall and Onshore Cable Route; and
 - c. Night-time – Landfall and Onshore Cable Route
- 5.5.9. In the operational phase, Scenario 1 is considered to have a greater potential impact due to additional onshore infrastructure associated with Norfolk Vanguard. The Applicant has assessed the potential effects during Operation [APP-238, Section 25.8.6] cumulatively with Norfolk Vanguard, as the two onshore project substations would operate simultaneously.
- 5.5.10. The National Grid substation extension and overhead line modifications are not considered within the operational noise assessment; the Applicant expects that the normal operational noise levels would be minimal as there would be no transformers on the site. The Applicant states that this has been agreed with stakeholders [APP-238, para 147].

Noise Sensitive Receptors (NSR) and noise sensitive locations

- 5.5.11. The effects of noise have been assessed along landfall, cable route and the substations, at identified specific receptor locations called NSR. NSRs are residential premises, schools, places of worship, recreational areas and noise sensitive commercial premises. The full list of NSRs are presented within the ES [APP-238, Table 25.27], and have been identified in the maps in Figure 25.2 [APP-470]. The receptor locations include:
- a. NSRs around landfall (reference numbers LFR1H to LFR4H)
 - b. NSRs along the cable route (reference numbers CRR1E to CRR4G, and CRR1 to CRR33)
 - c. NSRs around the substations (reference numbers SSR1 to SSR11)
- 5.5.12. NSRs around landfall and the cable route would be affected by construction activities, and these are described in the OCoCP, including identification of NSRs that would require enhanced mitigation [REP18-019, Section 9].
- 5.5.13. The NSRs in the vicinity of the onshore project substation would be affected by construction activities, as well as ongoing operational noise.

These specific NSRs have been defined in the dDCO as noise sensitive locations. Operational noise at noise sensitive locations would be monitored to ensure compliance with the agreed noise levels, and to implement any remedial measures if required. This is secured through R27 in the rDCO.

- 5.5.14. Matters relating to NSRs and monitoring of operational noise at noise sensitive locations was discussed in the Examination and have been reported on later in this Section.

Mitigation proposed

- 5.5.15. Embedded mitigation that is common across the project is set out in Section 5.1.
- 5.5.16. Embedded mitigation for noise and vibration includes adhering to the principle of Best Available Techniques (BAT) for operation and onshore infrastructure, and maintenance of the onshore project substation to minimise noise, including regular visits by staff for routine checks and maintenance [APP-238, Section 25.8.1, Table 25.33].
- 5.5.17. Standard mitigation for adverse construction noise effects would comprise of the Construction Noise Management Plan (CNMP) which forms part of the CoCP. The CNMP would include standard construction noise mitigation practices and captures good practice construction management. The CNMP is secured through the rDCO R20(2)(e) [REP18-009] and listed in the Schedule of Mitigation [REP18-017, Table 18]. The Applicant states that while the outcome of adopting the methods set out in the CNMP cannot be precisely quantified, it has made a conservative assumption of 5dB(A) reduction by incorporating these mitigation measures [APP-238, Section 25.8.5.6].
- 5.5.18. Enhanced mitigation measures would be required to augment standard mitigation to ensure noise effects at specific NSRs are further minimised. The enhanced mitigation measures would be drawn up and agreed as part of the CNMP, and would include measures that are listed in the Schedule of Mitigation, such as localised screening, temporary noise barriers and construction plant selection [APP-238, Section 25.8.5.7] [REP18-017, Table 18].
- 5.5.19. Enhanced mitigation to minimise construction traffic noise would be implemented through a Traffic Management Plan (TMP) secured in the rDCO R21 [REP18-009].

Enhanced mitigation for operation noise effects

- 5.5.20. Enhanced mitigation for operation noise effects would be identified to ensure noise emissions do not exceed the noise limits imposed on the existing Dudgeon substation [APP-238, paras 109, 299]. This was agreed with Breckland Council [REP9-013]. This is secured through rDCO R27 [REP18-009], which specifies maximum noise rating levels.

Local Impact Reports

- 5.5.21. Broadland DC's concerns relate to cumulative adverse effects of the construction traffic associated with the proposed Norfolk Vanguard OWF and Hornsea Project Three OWF with the Proposed Development on the villages of Oulton and Cawston. Broadland DC's concerns are inter-related to traffic and transportation effects and have been discussed in Section 5.2 of this Chapter [REP2-065].
- 5.5.22. North Norfolk DC (NNDC) considers that the R20 Code of Construction Practice and the R26 Construction Hours in the dDCO would provide an effective way to help to minimise any adverse impacts from noise and vibration during the construction phase [REP2-087].

Issues

- 5.5.23. Matters arising during the Examination relating to noise and vibration resulting from increased traffic are discussed in Section 5.2 of this Recommendation Report. These include:
- a. the effects on properties on either side of the High Street in Cawston;
 - b. the effects of construction traffic on Old Railway Gatehouse at Oulton; and
 - c. the effects on properties on Little London Road, North Walsham.

Rationale for the location of NSRs and enhanced mitigation

- 5.5.24. The ExA sought clarification at WQ1 and WQ3 on the definition of NSRs and the rationale for the distribution of receptor locations and at various points along the landfall, the cable route and near the substation [PD-008, Q12.2.1]. In the Statement of Common Ground (SoCG) Broadland DC raised concerns on the appropriateness of the position of certain NSRs [REP6-026]. NNDC highlighted in its ISH3 post-hearing submission that matters relating to the definition and identification of NSRs during construction were under discussion with the Applicant [EV-001] to [EV-006] and [REP4-031].
- 5.5.25. The Applicant acknowledged that there would be other NSRs in close proximity to the landfall and the onshore cable route that are not specifically assessed within the ES. To explain its methodology the Applicant highlighted two things: Table 9.1 in the OCoCP which provides a description and examples of high, medium, low and negligible sensitivity NSRs [REP18-019, Table 9.1], and the NSRs identified in the ES to assess construction noise effects are representative locations based on the OCoCP Table 9.1 [APP-238, Table 25.27]. The Applicant explained that locations identified in the ES and the definition table in OCoCP would be used during detailed design stage to identify other potential receptor locations at similar distances from the cable route where further noise assessment, and enhanced mitigation measures could be required. Additional NSRs and enhanced mitigation measures would be included in the CNMP, which would be reviewed by the relevant planning authority as part of the final CoCP under discharge of dDCO R20 (2) [REP2-021, Q12.2.1], [REP5-045, 2.12.2.5] and [REP7-017, Q3.12.2.1]. Broadland DC was content with this explanation and welcomed the opportunity to

identify additional NSRs and process to review the final CNMP, secured through the OCoCP under rDCO R20(2) [REP7-036].

- 5.5.26. NNDC proposed further minor amendments to the sensitivity description and examples listed in Table 9.1 in the OCoCP. Additionally, NNDC requested the addition of address and map references for the NSRs identified as potentially requiring enhanced mitigation in Table 9.2 in the OCoCP. The Applicant accepted these amendments which are reflected in the final OCoCP [REP18-019]. The agreed position between all three parties is set out in a joint position statement [REP7-034], and the final SoCGs [REP10-040] and [REP10-036].
- 5.5.27. The Applicant has stated that the ES [APP-238, 25.4.1.1] has utilised the threshold based 'ABC' method for assessing noise impacts during construction projects (BS 5228:2009+A1:2014), where Category A set out lower threshold values for ambient noise levels than Category B. NNDC raised concern over the use of higher ambient noise levels (Category B) for some NSRs, with particular reference to night working, and suggested that selecting Category A would be more appropriate to protect NSRs from night-time noise disturbance [REP6-043]. The Applicant has incorporated NNDC's suggestion to adopt the 45dBA threshold (i.e. BS 5228 Threshold Category A at all receptors) for all residential receptors during any night time working by revising the OCoCP [REP18-019, para 137], which is secured in rDCO R20(2)(e).
- 5.5.28. The ExA asked about the process of identifying the receptor locations that would require enhanced mitigation and for further details about the design and effectiveness of noise barriers at WQ1, WQ2 and WQ3. The ExA also sought assurance from relevant planning authorities whether the Applicant's commitment in the OCoCP to engage with them to agree additional receptor locations requiring enhanced mitigation was adequate.
- 5.5.29. The Applicant stated that the contractor would identify the specific NSRs that require enhanced mitigation during detailed design stage and include them in the CNMP. The CNMP would be submitted for review by the relevant planning authority as part of the final CoCP and discharge of R20 [REP2-021, Q12.2.4] [REP5-045, 2.12.2.5] and [REP7-017, Q3.12.2.3-6]. Revised wordings in the OCoCP include a process whereby relevant local authorities can review the CNMP as part of the discharge of R20 [REP18-019, Section 9.2]. The Applicant confirmed that the OCoCP includes the commitment that the specification and location of noise barriers would be presented in the CNMP and subject to agreement with the relevant planning authority [REP18-019, para 144]. Additionally, the relevant planning authorities were satisfied that the Applicant's commitment in the OCoCP and the R20 (CoCP) and R27 (operational noise) in the dDCO [REP18-011] provide control [REP7-036] and [REP10-040].

ExA's reasoning

- 5.5.30. The ExA accepts the Applicant's rationale regarding the description and identification of NSRs as described in the ES and OCoCP. The ExA is also

satisfied with the approach agreed between the Applicant, NNDC and Broadland DC that the identification of additional NSRs and potential enhanced mitigation measures would happen at detailed design through the CNMP. The ExA considers that this approach has been satisfactorily captured in the OCoCP.

- 5.5.31. The ExA welcomes the changes to the OCoCP to adopt the Category A 45dBA noise threshold for all residential receptors during any night-time working, and notes that this meets NNDC's noise threshold requirement. The ExA is satisfied with the changes in the OCoCP, [REP18-019, Section 9.2 and para 144] and considers that these changes ensure that the assessments of noise effects at NSRs, identification of additional NSRs, and details of enhanced mitigation measures would be augmented with ongoing discussion, review and approvals from the relevant planning authorities.
- 5.5.32. In light of agreement with the relevant planning authorities, the ExA is content that matters relating to identification of NSRs and enhanced mitigation, would be covered in the CNMP and CoCP and secured through R20 in the rDCO.

Operational noise at Ivy Todd Farm

- 5.5.33. There was consistent disagreement between an IP at Necton and the Applicant regarding the effects of operational noise at Ivy Todd Farm (reference number SSR2) [REP5-091]. Here the ExA would like to clarify that for operational noise, Scenario 1 cumulative noise effects presents the worst case, and is the matter being discussed.
- 5.5.34. One IP and Necton Parish Council (Necton PC) challenged the baseline noise survey at Necton with particular reference to the duration of baseline noise monitoring at the NSR SSR2 at Ivy Todd Farm [REP5-091] [REP5-064]. The Applicant has provided further details and specified that the survey was undertaken in accordance with relevant technical standards BS7445:2003 and BS4142:2014. Furthermore, the Applicant highlights that the survey dataset was agreed with local authorities and other stakeholders at the Expert Topic Group (ETG) as being representative of each receptor, forming the basis for assessment reported in the ES [REP6-013]. Breckland Council confirmed this position that the noise and vibration monitoring survey collected sufficient data in appropriate locations to undertake the noise assessment and that the baseline environment that underpins the ES is appropriate [REP6-041], [REP9-013].
- 5.5.35. The IP further challenged that the distance of the NSR SSR2 at Ivy Todd Farm which is at a distance of 750m from the proposed onshore project substation [REP5-091], [REP8-035], potentially leaving the intervening farm area of 768 acres with higher noise levels. The Applicant explained that the receptor locations reflect the locations of the closest human receptors. In that regard, residential receptors are considered to be of medium sensitivity and have a limited tolerance of effect, and agricultural land is considered to have negligible sensitivity where noise is not expected to be detrimental [REP9-011]. The Applicant also stated that

the locations and methodology were discussed and agreed in consultation with Breckland Council detailed in the SoCG [REP9-013]. The distance of SSR2 represents the nearest residential receptors, and as such the Applicant's position is that no change is necessary to accommodate land used for agricultural purposes.

- 5.5.36. The IP raised concerns about the suitability of the noise threshold limit of 32dB(Z) 100hz agreed by the Applicant with Breckland Council. The IP stated in their assessment the Applicant's Baseline Noise Survey Appendix 25.1 demonstrated that noise levels were lower at survey points surrounding the substations, and therefore the substations would be heard at surrounding locations and at Ivy Todd Farm [REP5-091].
- 5.5.37. The Applicant highlighted the findings in ES Chapter 25 [APP-238, Table 25.44] that show that the Scenario 1 cumulative noise effects (worst case) assume that onshore project substation for the Proposed Development, along with the Norfolk Vanguard onshore substation and Dudgeon substation fully operational and mitigated (where necessary), would still fall within the noise threshold limit of 32dB(Z) 100hz [APP-238, para 295]. Additionally, the Applicant confirmed that the predicted noise levels demonstrated negligible impact at identified receptor locations in accordance with the relevant technical standards (BS 4142:2014) [REP6-013] [REP7-016].
- 5.5.38. The Applicant highlighted that R27(1) and (2) secure the noise rating level for the substation operation which must not exceed 35dB at any time at a free field location immediately adjacent to any noise sensitive location. As such, the noise threshold limit is not specific to SSR2, but must apply at any time at a free field location immediately adjacent to any NSR. The Applicant stated that according to noise assessments, with the use of noise reduction technology and procurement of low noise emitting equipment, this requirement could be achieved, and no impacts would occur [REP11-008]. The ExA notes that 18.10 and 18.11 in the Schedule of Mitigation identify measures and technology to minimise operational noise [REP18-017].
- 5.5.39. The ExA visited the Dudgeon and National Grid Necton substations at the ASI on 23 January 2020 [EV8-002] and listened to low hum from transformers and crackle from open conductors. The ExA sought clarification from Breckland Council and in particular asked if Breckland Council was satisfied that the noise rating levels would be achieved at the most suitable location with respect to the nearest receptor location [PD-008]. Breckland Council did not respond to specific questions asked by the IP regarding the appropriateness of the agreed noise threshold limit at SSR2. However, the ExA notes that the Council reiterated its position that the limit agreed for the noise rating level at the substation is agreed and appropriate [REP6-041]. This is confirmed in the SoCG [REP9-013].
- 5.5.40. The ExA asked the Applicant and Breckland Council to explain what action could be taken should monitoring identify that the noise rating levels specified in R27 are exceeded. Subsequently, the Applicant brought forward revisions to R27 in the dDCO as a result of a suggested

addition from the Secretary of State for the Norfolk Vanguard applicant, and the revisions include a commitment in R27(3) that the Applicant would submit to the relevant planning authority “no later than 28 days following completion to confirm the rating level of operational noise emissions do not exceed the levels specified in subparagraphs (1) and (2), including details of any remedial works and a programme of implementation should the emissions exceed the stated levels”.

- 5.5.41. The Applicant’s responses through the Examination, the proposed changes in the dDCO and Breckland Council’s position did not satisfy the IP, and the matter has been raised in several representations, in almost all Examination deadlines and hearings. At the close of the Examination, while the matters relating to operational noise at the onshore project substation was agreed between the Applicant and Breckland Council, it remained unresolved with the IP [REP17-016].

ExA’s reasoning

- 5.5.42. The ExA acknowledges that the effects of noise and vibration during construction and ongoing operational phase, is a real concern for local residents. This is evident from the numerous representations during the Examination deadlines and hearings, made by residents, NSAG and the Parish Councils. Although IPs raised concerns and provided evidence anecdotally, this view was not supported by Breckland Council.
- 5.5.43. The ExA is persuaded by the Applicant that the baseline noise survey is adequate. The ExA notes that the survey findings and baseline was agreed with local authorities at the ETG and underpinned the assessment in the ES. Additionally, Breckland Council confirmed during the Examination that it was content with the baseline noise survey. The ExA also takes note that the Applicant, as stated in the ES, has followed the relevant British Standards to determine the baseline. The ExA is persuaded by the Applicant’s argument that the location of SSR2 is based on the closest human receptors, which is considered to be of high sensitivity, rather than be located in agricultural land which is of negligible sensitivity. The ExA agrees with the location of SSR2, which was agreed with local authorities, as were all other SSRs.
- 5.5.44. The ExA has considered the numerous representations that came forward regarding the appropriateness of the noise threshold limit for operational noise from the project substations. However, the ExA has seen no evidence to challenge the expertise of Breckland Council and its confirmation that the noise rating level as stated in R27 is appropriate. Additionally, the ExA did not see any evidence from IPs that convincingly challenges the arguments put forward by the Applicant and its agreement with Breckland Council. As such, the ExA accepts the agreed noise rating limit as stated in R27.
- 5.5.45. The ExA is reassured by the worst case assumption made by the Applicant, regarding Scenario 1 that all substations included in the CIA are fully operational to achieve the noise ratings limit set in R27. In that regard, the ExA accepts the Applicant’s assertion that the noise threshold limit is achievable. Additionally, the ExA is convinced by the

commitments as secured through rDCO R27 and agrees with this change to R27 that have been brought forward through the Examination, to monitor compliance with the noise rating levels together with any remedial works should the emissions exceed the agreed levels.

- 5.5.46. In light of the evidence submitted by the Applicant, the agreement of matters with Breckland Council, and in the absence of any substantive evidence to the contrary, the ExA accepts the Applicant's approach to assessing the noise and vibration effects of the onshore project substation, and that the residual effects would be adequately monitored through R27(1) and (2) and mitigated through R27(3) and the OCoCP.

Decommissioning

- 5.5.47. While no decision has been made regarding the final decommissioning policy for the onshore cables, it is likely the cables would be pulled through the ducts and removed, with the ducts themselves left in situ. The Applicant anticipates that the worst case scenario for noise effects would be similar to those during construction. The decommissioning methodology would be agreed with the relevant authorities and statutory consultees, and the works could be subject to a separate licencing and consenting approach [APP-238, Section 25.8.7]. The ExA accepts the Applicant's assessment.

Cumulative effects

- 5.5.48. The following projects have been assessed for noise and vibration cumulative effects relating to construction, operation and decommissioning activities, for both Scenarios 1 and 2 of the Proposed Development unless otherwise stated:
- a. Norfolk Vanguard Offshore Wind Farm (Scenario 1 only);
 - b. Hornsea Project Three Offshore Wind Farm; and
 - c. Dudgeon Offshore Wind Farm.
- 5.5.49. The Applicant states that for CIA Scenario 1 is the worst case, and the predicted noise levels reported at each NSRs for the Proposed Development and cumulatively with the Norfolk Vanguard scheme (with mitigation), demonstrate compliance with the proposed requirements in accordance with BS 4142:2014 [APP-238, para 295]. The Applicant has agreed with Breckland Council that the cumulative effects from noise and vibration have been appropriately assessed, and the effects would not be significant in EIA terms [REP9-013]. The ExA is content that the cumulative effects of noise and vibration during the operational phase has been integral to the assessment in the ES and proposed mitigation, and is as such secured through R27 of the rDCO.

Conclusions

- 5.5.50. Regarding the definition and location of NSRs and the proposed enhanced mitigation, the ExA agrees with the changes made to the OCoCP over the course of the Examination, which are agreed with relevant planning authorities and secured through R20 in the rDCO. In that respect the ExA is content that the Proposed Development complies with NPS-EN1 paras

4.5.2 and 5.11.4. In accordance with para 5.11.8 and 5.11.9 of NPS-EN1, the ExA is satisfied that through the measures secured in R20 (CoCP), the Proposed Development would employ good design to mitigate adverse noise effects.

- 5.5.51. The ExA notes and sympathises with the concerns raised regarding operational noise at the project substation. Here the ExA relies on the confirmation from Breckland Council, and is persuaded by the Council and the Applicant that the approach to assess, monitor, and implement remedial measures with respect to operational noise and vibration from the substation of the Proposed Development alone, and cumulatively with Norfolk Vanguard OWF and Dudgeon substation, is sound. The ExA is, therefore, content to conclude that the Proposed Development, subject to the changes in the rDCO complies with NPS-EN1 para 5.11.6.
- 5.5.52. The ExA acknowledges that agreement was reached between the Applicant and all planning authorities, noted in the SoCGs. The ExA is content that the measures set out in R20 (CoCP), and R27 (operational noise) would provide an effective way to minimise adverse onshore noise and vibration effects. However, the ExA highlights that there are matters that were unresolved between IPs and the Applicant at the close of the Examination regarding the noise effects of construction traffic (discussed in Section 5.2). The ExA has taken into account the inter-related and cumulative adverse effects of construction and operation noise at Necton, Cawston, Oulton, North Walsham and Happisburgh, which would affect the day to day life of residents and businesses in a significant way. This has been reported in Section 5.22 of this Recommendation Report. The ExA concludes that residual noise and vibration carry little weight against the making of the Order.

5.6. TERRESTRIAL BIODIVERSITY, BIOLOGICAL ENVIRONMENT, AND ECOLOGY

Background and policy context

Introduction

- 5.6.1. This section of the report deals with the EIA effects of the Proposed Development on terrestrial biodiversity, biological environment and ecology. Natura 2000 sites are subject to Habitats Regulations Assessment (HRA) and are detailed in Chapter 6 below. As there is a high degree of overlap between the EIA and HRA process, where relevant, issues are cross-referenced to Chapter 6.
- 5.6.2. Biodiversity, biological environment and ecology were identified as a principal issue in the ExA's initial assessment, as reported in Chapter 4 of this report. The principal issues included the onshore effects on protected flora and fauna and designated sites. These and others raised during the Examination, are reported below.

- 5.6.3. The effects on water resources, including designated water resources, are discussed in detail in Section 5.7 of this report.

National Policy Statements

- 5.6.4. The Overarching National Policy Statement for Energy (NPS EN-1) provides the primary basis for decision making in relation to onshore ecology. The policy tests for biodiversity and geological conservation are given in NPS EN-1 Section 5.3.
- 5.6.5. NPS EN-1 para 5.3.7 states that as a general principle development should aim to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. Where significant harm cannot be avoided then appropriate compensation measures should be sought. Para 5.3.8 states that the decision-maker should *"ensure that the appropriate weight is attached to designated sites of international, national and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment."*
- 5.6.6. NPS EN-1 para 5.3.11 requires that where a development is likely to have an adverse effect on a Site of Special Scientific Interest (SSSI), development consent should not normally be granted. An exception to this should only be made *"where the benefits (including need) of the development at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs."* The decision maker *"should use requirements and/or planning obligations to mitigate the harmful aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest."*
- 5.6.7. Para 5.3.17 requires the decision-maker to ensure that species and habitats that receive statutory protection or have been identified as being of principal importance for the conservation of biodiversity, are protected from the adverse effects of development by using requirements or planning obligations. The decision-maker should *"refuse consent where harm to the habitats or species and their habitats would result, unless the benefits (including need) of the development outweigh that harm."* The decision-maker should *"give substantial weight to any such harm to the detriment of biodiversity features of national or regional importance which it considers may result from a proposed development."*
- 5.6.8. The Habitats Regulations provide statutory protection for those sites identified through international conventions and EU Directives. These internationally designated sites are detailed in Chapter 6 Findings and Conclusions in Relation to Habitats Regulation Assessment.

The National Planning Policy Framework

- 5.6.9. The National Planning Policy Framework (NPPF) establishes that the planning system should contribute to and enhance the natural and local

environment by protecting and enhancing sites of biodiversity value. It states that development should minimise impacts on and provide net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

- 5.6.10. The NPPF states that if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.

The application

Environmental Statement

- 5.6.11. The Applicant's assessment of impacts on terrestrial ecology is set out in the following documents:

- a. ES Chapter 22 Onshore Ecology [APP-235];
- b. ES Chapter 23 Onshore Ornithology [APP-236];
- c. ES Chapter 33 Onshore Cumulative Impact Assessment [APP-246];
- d. ES Chapter 34 Summary [APP-247].

- 5.6.12. Each of these volumes is supported by a number of figures and appendices that contain technical reports and details of surveys and data collection.

- 5.6.13. European designated sites are considered in Chapter 6 of this report. The primary terrestrial ecology issues in relation to the Proposed Development therefore are impacts of construction activities on other designated sites, protected species and habitats.

- 5.6.14. As the majority of the onshore Proposed Development area covers the same footprint as the Norfolk Vanguard project, the data collected as part of the Norfolk Vanguard project has been used to characterise the baseline for this Proposed Development and to inform the EIA [APP-235]. This approach was agreed with Natural England (NE) [REP16-010] and Norfolk County Council (NCC) [REP16-012].

- 5.6.15. The main EIA issues considered during the Examination included:

- a. the use of Horizontal Directional Drilling (HDD) and the need for safeguarding affected waterbodies, which is discussed in detail in Section 5.7;
- b. the adequacy of the hedgerow mitigation plan;
- c. consultation on Water Crossing Plans;
- d. inclusion of mitigation for impacts on air quality;
- e. impacts on Norfolk hawk dragonfly;
- f. classification of chalk rivers;
- g. net environmental gain; and
- h. post construction monitoring.

- 5.6.16. The ExA examined these issues with reference to the appropriate legislation and policies described in Chapter 3, through written questions

and in an ISH on Thursday 14 November 2019 [EV5-001 to EV5-006]. Concerns relating to these issues were expressed throughout the Examination by NE and the Environment Agency (EA). The Applicant's approach to the potential HDD effects to the River Wensum are considered in Section 5.7 of this Recommendation Report in relation to EIA deliberations and in Chapter 6 in relation to HRA considerations. The Applicant's approach to mitigation for Paston Great Barn are considered both in this Section in relation to EIA deliberations and in Chapter 6 in relation to HRA considerations.

- 5.6.17. The Applicant has proposed two types of mitigation to minimise adverse effects:
- a. embedded mitigation which is secured through the design of the proposed development and through the Outline Code of Construction Practice [REP5-010] and Outline Landscape and Ecological Management Strategy [REP5-022];
 - b. additional mitigation, described in Section 6.5.5.2 of ES Chapter 6 [APP-219], which was adopted by the Applicant during the EIA process to reduce or eliminate any predicted significant impacts as detailed in the Schedule of Mitigation [REP18-017] and secured through various control documents and rDCO requirements.
- 5.6.18. Embedded mitigation in relation to onshore ecology is detailed in Section 22.7.1 of ES Chapter 22 [APP-235] and for onshore ornithology in Section 23.7.1 of ES Chapter 23 [APP-236]. This includes:
- a. avoidance of international and national designated sites for nature conservation during route selection;
 - b. refining the route to avoid where possible standing water bodies, trees and agricultural ditches;
 - c. minimising the width of gaps in hedgerows; use of trenchless crossing techniques at all County Wildlife Sites, including proposed sites, to minimise impacts on habitats;
 - d. designing the construction programme for the onshore cables to minimise the duration and extent of impacts to ecological receptors along the onshore cable route; and
 - e. mitigation planting at the onshore Proposed Development substation to help consolidate green corridors for wildlife.
- 5.6.19. Additional, or further mitigation, is detailed in Sections 22.7.5 and 22.8 of ES Chapter 22 [APP-235] and Sections 23.7.5 and 23.8 of ES Chapter 23 [APP-236]. These sections include site specific details regarding sediment management and pollution prevention measures for River Wensum SSSI and Wendling Beck trenchless crossings; hedgerow mitigation at Paston Great Barn SSSI and other important bat commuting/foraging areas to minimise effects on commuting and foraging barbastelle bats; and botanical surveys and clearance of pioneer woodland species at Wendling Carr County Wildlife Site (CWS).
- 5.6.20. For protected species, additional mitigation includes reinstatement of pond habitats lost during construction; relocation of active badger setts; pre-construction survey, displacement and reinstatement of water vole

habitat; control of night works to minimise indirect effects on otters; pre-construction surveys and precautionary methods of working to avoid harming Great Crested Newts and reptiles; pre-construction surveys at Reepham Stream and Booton Watercourse to assess suitability for supporting spawning bullhead and brown trout; developing an Invasive Species Management Plan; and design of a lighting scheme during operation to minimise light spill to reduce effects on bats.

- 5.6.21. With respect to ornithology, additional mitigation at Pigney's Wood Local Nature Reserve (LNR) and land south of Dillington Carr CWS includes adherence to Joint Nature Conservation Committee's scheme to reduce disturbance to waterfowl during severe winter weather; reinstating habitats which are temporarily lost during construction; and best practice construction mitigation to minimise dust, noise and light emissions.
- 5.6.22. For the onshore cable route, additional mitigation includes only working for one winter period in consecutive years to minimise potential effects on lapwing and other species using arable land habitats; reinstating habitats which are temporarily lost during construction; and if land north of Penny Spot Beck within the River Wensum floodplain was used during construction, then works would take place outside of the winter period or if this was not possible, an area of the floodplain habitat to be agreed with NE post-consent would be left undisturbed to provide wintering habitat for waders/wildfowl using the site for the duration of the works in that area.
- 5.6.23. Additional mitigation for breeding bird species includes the removal of all nesting habitat for common breeding birds outside of the bird breeding season; keeping the winter crop stubble within the onshore Proposed Development area low during the bird breeding season in order to minimise the chance of notable ground nesting birds nesting prior to the works; setting aside ground-nesting bird areas outside of 50m of the cable route prior to construction works to be agreed with NE post-consent; reinstatement of hedgerows following the guidance within the Norfolk hedgerow Biodiversity Action Plan (BAP); and adhering to recommendations for birds in the Bat Conservation Trust's (BCT's) Artificial Lighting and Wildlife Guidance (2014) during temporary works at the HDD compounds.
- 5.6.24. For mitigation of habitats and bird species during operational and maintenance activities a lighting scheme would be designed for the permanent infrastructure, which would include measures to minimise light spill following the recommendations regarding birds set out in the BCT Artificial Lighting and Wildlife Guidance (2014). The lighting scheme is secured in the Outline Landscape and Ecological Management Strategy (OLEMS) [REP14-020].

Ecological receptors assessed by the Applicant

Statutory Designated Sites

- 5.6.25. The Applicant based the study areas for onshore ecological receptors depending on the sensitivity and habitat preferences of receptors,

standard guidance and professional judgement [APP-235]. The study areas are given in Table 5.6.1 below.

Table 5.6.1 Study areas for different onshore ecology receptors

Site/Survey	Study area
Statutory designated site	Within 2km of the onshore Proposed Development area
Statutory designated site located	Within 200m of site access routes which exceed set air quality criteria
Non-statutory designated site	Within 2km of the onshore Proposed Development area
UKHPI and Norfolk LBAP habitat	Within 50m of the onshore Proposed Development area
Protected and notable species (except great crested newts <i>Triturus cristatus</i>)	Within 50m of the onshore Proposed Development area
Great crested newts	Within 250m of the temporary onshore Proposed Development area and within 500m of the permanent onshore Proposed Development area
Ornithological species	Within 50m of the onshore Proposed Development area

5.6.26. The statutory sites identified were detailed by the Applicant in Table 22.10 of ES Chapter 22 [APP-235] and Table 23.12 of ES Chapter 23 [APP-236] and are:

- a. Norfolk Valley Fens SAC
- b. River Wensum SAC, SSSI
- c. Paston Great Barn SAC, SSSI
- d. Beetley & Ho Meadows SSSI
- e. Dereham Rush Meadow SSSI
- f. Foxley Wood SSSI
- g. Dillington Carr, Gressenhall SSSI
- h. East Ruston Common SSSI
- i. Holly Farm Meadow, Wendling SSSI
- j. Honeypot Wood, Wendling SSSI
- k. Whitwell Common SSSI
- l. Bryant's Heath, Felmingham SSSI
- m. Cawston and Marsham Heaths SSSI
- n. Happisburgh Cliffs Geological SSSI
- o. Booton Common SSSI
- p. Felmingham Cutting Local Nature Reserve (LNR)
- q. Knapton Cutting LNR
- r. Pigney's Wood LNR

5.6.27. In terms of statutory designated sites, Norfolk Valley Fens SAC, River Wensum SAC and Paston Great Barn SAC are discussed in Chapter 6.

Non-Statutory Designated Sites

5.6.28. A total of 95 non-statutory designated sites, CWS and Roadside Nature Reserves have been identified within the designated sites study area, as

shown in Figure 22.3 of Chapter 22 Onshore Ecology [APP-235]. Five sites are located directly within the onshore Proposed Development area and have potential ornithological interest(s). These sites are:

- a. Wendling Carr CWS (CWS no. 1013);
- b. Little Wood CWS (CWS no. 2024);
- c. Land South of Dillington Carr CWS (CWS no. 1025);
- d. Marriott's Way CWS (CWS no. 2176) (crossed twice); and
- e. Paston Way and Knapton Cutting CWS (CWS no. 1175).

- 5.6.29. Of the remaining 90 sites, seven are located adjacent to the onshore Proposed Development area, 11 are located within 300m of the area and the remaining sites are located between 300m and 2km from the onshore Proposed Development area.
- 5.6.30. In addition, there is a proposed CWS which, if it is designated, would be located within the onshore Proposed Development area at Kerdiston between Kerdiston Hall and the Marriott's Way ('Kerdiston Old Hall Meadows'). This site has potential ornithological interest in its grassland and hedgerow areas.
- 5.6.31. With the exception of NE, there was no comment from any IP on the identification of sites throughout the Examination. NE [RR-099] required Broadland SPA and Ramsar to be scoped in with the same mitigation as provided for in the Norfolk Vanguard OWF application. This was done by the Applicant [AS-003] and NE confirmed its satisfaction [REP3-022].
- 5.6.32. Having taken into account the relationship between the Proposed Development and the statutory and non-statutory designated sites, the ExA concurs with the Applicant's identification of sites.

Residual Impacts

- 5.6.33. The residual impacts on both statutory designated and non-statutory sites for Scenario 1, in relation to onshore ecology, are set out in Table 22.31 of Chapter 22 Onshore Ecology [APP-235] and for Scenario 2 in Table 22.32. For onshore ornithology, the residual impacts are given in Table 23.34 of Chapter 23 Onshore Ornithology [APP-236] for Scenario 1 and Table 23.35 for Scenario 2. No significant effects were identified by the Applicant for any of these sites.
- 5.6.34. The ExA agrees with the conclusions drawn by the Applicant and is content that any measures to ensure effects would not be significant are adequately described and secured. Where there were discussions during the Examination about these sites, these are presented below.

Species

- 5.6.35. As the majority of the onshore Proposed Development area for both Norfolk Boreas and Norfolk Vanguard cover the same footprint, the Applicant has used the data collected as part of the Norfolk Vanguard project, collected between 2016 to 2018, to characterise the baseline for this Proposed Development and in turn to inform the EIA [APP-235]. This approach was agreed with NE [REP16-010]. In addition, an extended

Phase 1 Habitat Survey Report was undertaken in 2018 to provide targeted data to cover selected gaps in the existing baseline data for the study areas. These surveys [APP-592] to [APP-599] confirmed the presence of a wide variety of terrestrial habitats, summarised in Table 22.11 [APP-235] and protected, notable and invasive species.

- 5.6.36. The residual effects for both habitats and species for Scenario 1, in relation to onshore ecology, are set out in Table 22.31 of Chapter 22 Onshore Ecology [APP-235] and for Scenario 2 in Table 22.32. For onshore ornithology, the residual impacts are given in Table 23.34 of Chapter 23 Onshore Ornithology [APP-236] for Scenario 1 and Table 23.35 for Scenario 2. The only significant effects identified were the result of moderate adverse impacts to hedgerows and bats under Scenario 2.

Local Impact Reports

- 5.6.37. Local Impact Reports were submitted at D2 by Breckland Council [REP2-062], Broadland DC [REP2-065], NNDC [REP2-087] and NCC [REP2-085].

Breckland Council

- 5.6.38. Policy ENV05 of the new Local Plan states that "*development proposals would be expected to contribute to and where possible enhance the local environment by recognising the intrinsic character and beauty of the countryside. Development should have particular regard to maintaining the aesthetic and biodiversity qualities of natural and man-made features within the landscape*".
- 5.6.39. Breckland Council considers that the Norfolk Boreas substation and National Grid extension works would be of such a scale that it would be difficult to argue that they would complement the natural landscape, natural features and built form that surround them. It advises that due regard needs to be had to the distinctive qualities of the proposed structures and their surroundings and the contribution new development makes to the qualities of these features.

Broadland District Council

- 5.6.40. Broadland District Council defers ecology and ornithology matters to NCC.

North Norfolk District

- 5.6.41. In terms of ecology and ornithology, NNDC is broadly supportive of the Proposed Development. It supports the Ecological Management Plan subject to agreement to the final OLEMS document [REP14-020] which underpins the requirement, and which should ensure key ecological objectives are met.

Norfolk County Council

- 5.6.42. NCC notes that the ecological baseline information provided in the Preliminary Environmental Information Report (PEIR), on which Chapters 22 and 23 of the ES [APP-235] and [APP-236] are based, for the Proposed Development is essentially the same as that in the PEIR and DCO submission for the 'sister' Norfolk Vanguard OWF project, although some additional ecological surveys are described that were undertaken in 2018. The County Council is supportive of the approach taken with regards to ecology and agree the baseline data presented in the PEIR is appropriate.

Issues

- 5.6.43. A number of IPs, including NE, NCC and EA commented on the assessment of impacts for a number of habitats and species during the Examination as set out in the following sections.

The use of HDD drilling and the need for safeguarding affected waterbodies

- 5.6.44. The EA [RR-095] and NE [RR-099] expressed concerns regarding trenchless crossings and the potential risk of bentonite breakout affecting water bodies. The resolution of this issue is detailed in Section 5.7: Water Resources and Flood Risk and Chapter 6 of this Recommendation Report.

SSSI Consent

- 5.6.45. NE [REP3-022] advised that the Applicant may need to include SSSI consent under The Wildlife and Countryside Act 1981 as amended. If an environmental incident should occur while the Applicant was undertaking activities as part of the cable installation as agreed in the DCO then the local planning authority, not NE, is the regulator as the activities are part of an existing plan or project.
- 5.6.46. To ensure that NE was consulted, and SSSI consent sought immediately an agreed set of words [REP9-058, Issue 27] are included in the OCoCP [REP18-019]. No further discussion took place on this issue.

The adequacy of the hedgerow mitigation plan.

- 5.6.47. NE [RR-099] expressed concern that the scope of the study area extending 2km from designated sites was not sufficient to incorporate wide ranging mobile species. It recommended that the study area for Paston Great Barn SSSI Barbastelle bats should cover foraging areas and supporting habitat. The Applicant agreed a 5km study area from Paston Great Barn SSSI with NE and NCC [AS-025]. This was confirmed by NE [REP2-080]
- 5.6.48. NE [RR-099] advised that prior to removal of hedgerows, a mitigation plan should be drawn up and agreed. The plan should include for the improvement of the hedgerows either side of the section to be removed including any gapping up, tree management and the development of scrub/rough grassland margins. The mitigation plan should be in place for 7 years or until the original hedgerow has recovered fully. There

should also be a monitoring commitment to ensure that hedgerows identified as of medium to high importance have been re-established to the same or higher quality.

- 5.6.49. The Applicant included the above mitigation measures in the OLEMS [REP14-020] with wording agreed by NE at D3 [REP3-022]. No further discussion took place on this issue and the ExA is satisfied that all necessary mitigation has been secured.

Inclusion of mitigation for impacts on air quality

- 5.6.50. NE [RR-099] noted that there was no mitigation included regarding reducing any potential air quality impacts from traffic and transport on habitats and species of conservation concern, in particular River Wensum SSSI and Felbrigg Woods SSSI.
- 5.6.51. In discussion with NE [REP3-024] the Applicant confirmed that final traffic numbers were below that which could lead to significant effects and agreed to include reference to the locations of designated sites in the Outline Traffic Management Plan (OTMP) [REP18-021]. The Applicant also agreed to include the following in the OTMP: *"In the event that the final vehicle movements differ from those set out in Appendix 1 and Appendix 2, then the assessment of air quality impacts upon designated sites presented within the Norfolk Boreas ES would be revisited to ensure that the impact level upon designated sites remains not significant."*
- 5.6.52. At D9 [REP9-058], NE considered that the air quality matter has been resolved.

Impacts on Norfolk hawker dragonfly

- 5.6.53. The ExA at First Written Questions (WQ1) [PD-008] sought from the Applicant how it would be determined whether there was any risk to the Norfolk hawker dragonfly from any changes to the Proposed Development and how further surveys resulting from such changes would be secured.
- 5.6.54. The Applicant [REP2-021] provided an explanation of the measures that would be taken to protect the dragonfly if the Proposed Development should interact with suitable habitats. However, at D5 [REP5-045] the Applicant explained that mitigation for the Norfolk hawker dragonfly would only be required in the event that a trenched method was used to cross the River Bure. As trenched methods would not be permitted under the rDCO, which requires a trenchless technique to be used for this crossing (Schedule 1 Part 1: Requirement 16(13)(d)), mitigation is not required and therefore not secured. The ExA is content with this position.

Cable Corridor depth

- 5.6.55. The ExA at WQ1 [PD-008] sought confirmation from the Applicant on how the depth of the onshore cable burial should be secured. The Applicant responded [REP2-021] that the minimum depth has been included in the private land agreements being sought for all affected land interests. The minimum depth, of 1.2m to the top of duct across all land,

would be included in Construction Method Statements as required by the OCoCP [REP18-019] and secured in R20 of the rDCO. No further discussion took place on this issue.

Consultation on Water Crossing Plans

- 5.6.56. The EA [RR-095] and NE [RR-099] expressed concerns regarding where the commitment to provide site specific water crossing plans were incorporated in the DCO. NE was particularly concerned regarding where the onshore cable route may impact upon water-dependant designated sites and the need for NE to be consulted. The resolution of this issue is detailed in Section 5.7 of this report.

Classification of chalk rivers

- 5.6.57. The EA [RR-095] expressed concerns regarding potential bentonite breakout during trenchless crossings of several rivers including chalk rivers, in particular the Rivers Bure and Wensum. The resolution of this issue is detailed in Section 5.7 of this report.
- 5.6.58. The EA [RR-095] also disputed the Applicant's definition of chalk rivers, which are priority habitats under the UK Biodiversity Action Plan. In response, the Applicant [REP1-018] refers to ES Chapter 22 Onshore Ecology [APP-235] which explains that rivers are UK Habitats of Principal Importance but are not included under the Norfolk Local BAP priority habitat. However, the Applicant has given UK Habitats of Principal Importance the highest level of importance ('high importance') within the Ecological Impact Assessment [APP-235]. Therefore, the Applicant argues, discrepancies in the definition of this habitat do not change the outcome of the assessment because rivers, including the relevant chalk rivers, have been classified as the highest importance.
- 5.6.59. The Applicant provided a Clarification Note for Trenchless Crossings and Potential Effects of Breakout on the River Wensum [REP1-039] which assesses both the River Wensum SSSI and SAC. The EA in its SoCG [REP16-007] is satisfied with the content of the Clarification Note, and the ExA is satisfied that the matter has been resolved.

Net Environmental Gain

- 5.6.60. NE [RR-099] noted that there is no policy included regarding net gain either within the Onshore Ecology Chapter of the ES [APP-235] or the Planning Statement [APP-693]. While accepting that there is no current requirement for the Applicant to demonstrate net gain, NE refers to the Government's 25 Year Environment Plan which states that it "*will ensure that we support development and the environment by embedding the principle that new development should result in net environmental gain*". Furthermore, the spring statement from the Chancellor (13th March 2019) also made specific reference to mandating biodiversity net gain, in which he said: "*Following consultation, the government will use the forthcoming Environment Bill to mandate biodiversity net gain for development in England, ensuring that the delivery of much-needed infrastructure and housing is not at the expense of vital biodiversity*". NE

concludes that in order to future-proof the Proposed Development DCO application, net gain should be incorporated into the design at the earliest opportunity.

- 5.6.61. In response the Applicant [AS-024] referred to Defra's Net Gain Summary of responses and Government response (July 2019) which confirms that "*nationally significant infrastructure and net gain for marine development will remain out of scope of the mandatory requirement in the Environment Bill*". At D2, responding to the WQ1 [PD-008, Q2.0.4] the Applicant [REP2-021] continued that habitat enhancements which would count as the creation of habitat units using the Defra biodiversity metric have been included within the OLEMS [REP8-005], however it would not undertake to provide net gain for the Proposed Development.
- 5.6.62. By the end of the Examination, both parties maintained their positions. NE [REP16-010] continued to recommend that net gain should be incorporated where possible as an example of best practice so that NSIP projects leave a lasting legacy. The Applicant would only include biodiversity enhancement measures in the OLEMS [REP14-020], which were deemed necessary on the basis of the assessment of impacts of the construction, operation and decommissioning of the onshore project area.
- 5.6.63. After due consideration, the ExA accepts that the Applicant has complied with current policy requirements.

Onshore Ornithology

- 5.6.64. NE [RR-099] noted that during the Norfolk Vanguard OWF examination that onshore ornithology surveys undertaken were not linked to crop rotations and were of insufficient duration. NE therefore considered that it was not possible to comment on potential direct effects on functionally linked habitats utilised by Broadland SPA and Ramsar species during construction. The Applicant committed to providing ornithological mitigation in a Clarification Note and the Norfolk Vanguard OLEMS. NE requested that these commitments should be included in the Norfolk Boreas integrity matrices, HRA, Schedule of Mitigation or OLEMS.
- 5.6.65. The Applicant included the necessary commitments in the Schedule of Mitigation [REP18-018], OLEMS [REP14-020] and dDCO Schedule 1, Part 3 Requirement 24(4) [REP18-009]. NE considered the matter resolved at D3 [REP9-058].

Post construction monitoring

- 5.6.66. At WQ1 [PD-008] the ExA asked NE if it was content with the Applicant's explanation [AS-024] of why there is no post-construction monitoring of bird habitat temporarily disturbed during construction. NE responded [REP2-080] that it was content in relation to the mitigation area for Broadland SPA species detailed in the OLEMS [REP14-020] which would be set aside for sugar beet during the construction phase.

- 5.6.67. The RSPB [REP2-095] supports the need to ensure post-construction monitoring is appropriate to enable the success of mitigation measures to be measured. Should the mitigation measures implemented prove unsuccessful, monitoring provides the opportunity to review and revise the scheme to ensure damaging impacts from the scheme are addressed.
- 5.6.68. No further discussion took place on this issue. The ExA is content with NE's response that post-construction monitoring is not necessary.

Cumulative Impacts

- 5.6.69. The assessment of cumulative effects for both scenarios [APP-235] was agreed by both NE [REP16-010] and the EA [REP16-007] as being appropriate and consistent with agreed methodologies.
- 5.6.70. The Applicant's Cumulative Impact Assessment [APP-246] determined that there would be no significant effects for onshore ecology or ornithology during construction, operation or decommissioning. No IP raised any comment relating to these issues during the Examination.

Conclusions

- 5.6.71. In terms of terrestrial biodiversity, biological environment, and ecology there was no major disagreement between parties on any issue. Most of the discussions were for clarification and alignment with Norfolk Vanguard commitments. The issues raised were equally applicable to both Scenario 1 and Scenario 2.
- 5.6.72. The only issues which were not agreed by all parties by the end of the Examination were net gain and the need for post-construction monitoring.
- 5.6.73. Regarding net gain, the ExA accepts the Applicant's view that it has complied with current regulation. However, the ExA suggests that the SoS may wish to consider requesting the Applicant to provide net gain, which should be agreed with NE, in the event that the DCO is made.
- 5.6.74. While the RSPB supports the need for post-construction monitoring of bird habitat temporarily disturbed during construction, after due consideration of the evidence, the ExA is content with NE's assessment that as the land in question would be set aside during the construction period, post-construction monitoring would not be necessary.
- 5.6.75. The ExA is content that for terrestrial biodiversity, biological environment, and ecology the Proposed Development would not result in significant effects and that all mitigation is secured appropriately. The ExA considers that the Proposed Development complies with the requirements of NPS EN-1 for biodiversity.
- 5.6.76. In terms of compliance with the requirements of NPS EN-1 and EN-3 the ExA concludes that the Applicant has complied with the requirements in that the Proposed Development aims to avoid significant harm to biodiversity and geological conservation interests, including through

mitigation, and has given consideration of reasonable alternatives. There would be no adverse effect on any SSSI and species and habitats that receive statutory protection or have been identified as being of principal importance for the conservation of biodiversity, would be protected from the adverse effects of development by using requirements in the rDCO.

- 5.6.77. The ExA therefore concludes that no weight should be given in respect of terrestrial biodiversity, biological environment, and ecology for and against the order being made.

Draft DCO and schedule of mitigation

- 5.6.78. The OCoCP [REP18-019] has been revised to ensure that NE would be consulted and SSSI consent sought immediately if an environmental incident should occur close to or in a SSSI.
- 5.6.79. A hedgerows mitigation plan has been included in the OLEMS [REP14-020]
- 5.6.80. Reference to the locations of designated sites has been made in the Outline Traffic Management Plan (OTMP) [REP18-021]. The Applicant also added in the OTMP *"In the event that the final vehicle movements differ from those set out in Appendix 1 and Appendix 2, then the assessment of air quality impacts upon designated sites presented within the Norfolk Boreas ES would be revisited to ensure that the impact level upon designated sites remains not significant."*
- 5.6.81. The minimum depth of 1.2m to the top of ducts across all land within the cable corridor would be included in Construction Method Statements as required by the OCoCP.
- 5.6.82. Schedules 9 and 10 Part 4 Condition 14(1)(l) is rewritten to secure the timing for submission and detail contained in an ornithological monitoring plan.
- 5.6.83. The Applicant included the necessary commitments in the Schedule of Mitigation [REP18-018], OLEMS [REP14-020] and dDCO Schedule 1, Part 3 Requirement 24(4) [REP18-009].

5.7. WATER RESOURCES AND FLOOD RISK

Background and policy context

Introduction

- 5.7.1. This Section reports matters related to water resources (to include flood, drainage and irrigation matters), having been identified as a principal issue in the ExA's initial assessment [PD-006]. This Section also reports on ground conditions and contamination which are matters closely related to water resources, but not identified as a separate principal issue in the ExA's initial assessment.

- 5.7.2. Related terrestrial ecological matters are discussed in Section 5.6 of this Recommendation Report. Offshore and intertidal water quality considerations are covered in Section 5.9. Effects on the water environment at landfall are covered in Section 5.10. Climate change matters are covered in more detail in Section 5.14.

National Policy Statements – Flood Risk

- 5.7.3. The Overarching National Policy Statement for Energy (NPS EN-1) Part 5.7 Flood Risk requires the SoS in reaching a decision on this DCO application to be satisfied that:
- a. the application is supported by an appropriate Flood Risk assessment (FRA), the development proposals are compatible with relevant national or local flood risk management strategy, are appropriately flood resilient and resistant, and that any residual risk can be safely managed over the lifetime of the development (NPS EN-1, para 5.7.9);
 - b. the Sequential Test has been applied as part of site selection; and a sequential approach has been used at site level to locate the most vulnerable uses to areas of lowest flood risk (NPS EN-1, para 5.7.9);
 - c. priority has been given to the use of Sustainable Drainage Systems (SuDS) and the DCO or associated planning obligations provide for the adoption and maintenance of any SuDS by the most appropriate body taking into account the nature and security of the infrastructure proposed (NPS EN-1, paras 5.7.10 and 5.7.19); and
 - d. the Sequential and Exception test requirements have been met for any development in Flood Zone 2 or 3 (NPS EN-1, paras 5.7.12 to 5.7.17); or
 - e. exceptionally, where an increase in flood risk elsewhere cannot be avoided or wholly mitigated, the increase in flood risk can be mitigated to an acceptable level taking account of the benefits of, and the need for the NSIP development and advice provided by the EA and other relevant bodies, and taking account of climate change (NPS EN-1, para 5.7.17).
- 5.7.4. NPS EN-1 Section 4.8 (Climate change adaptation) relates to flood risk and is covered in detail in Section 5.14 of this Recommendation Report. The National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) requires the Applicant to set out to what extent the Proposed Development is expected to be vulnerable to climate change, and, as appropriate, how it would be resilient to flooding, among other matters (NPS EN-5, para 2.4.1).

National Policy Statements – ground conditions and contamination

- 5.7.5. Policy tests relevant to ground conditions and contamination are included in NPS EN-1 Section 4, Pollution control and other environmental regulatory regimes at paras 4.10.3 to 4.10.8. In particular, the SoS should be satisfied that "*the relevant pollution control authority is*

satisfied that potential releases can be adequately regulated under the pollution control framework” and that cumulative effects of pollution are not unacceptable (NPS EN-1, para 4.10.7).

National Policy Statements – water resources

- 5.7.6. Other policy tests for water quality and resources are set out in NPS EN-1 Section 5 paras 5.15.4 to 5.15.8. In summary, the SoS should:
- a. have regard to the control regimes regulating water abstraction activities and works to and structures in, on or under a ‘controlled water’ and to considerations in NPS EN-1 Section 4.10 on the interface between planning control and pollution control for activities that discharge to the water environment (NPS EN-1, para 5.15.4);
 - b. be satisfied that a proposal meets the requirements of the Water Framework Directive (WFD) and has regard to relevant River Basin Management Plans and Water Resources Management Plans (NPS EN-1 paras 5.15.5 and 5.15.6);
 - c. consider whether requirements and/or planning obligations are needed to mitigate adverse effects on the water environment (NPS EN-1 paras 5.15.7); and
 - d. consider whether mitigation measures are needed over and above any which may form part of the application for DCO consent (NPS EN-1 paras 5.15.8).

National Planning Policy Framework

- 5.7.7. The National Planning Policy Framework 2019 (NPPF) is a relevant consideration for NSIP development proposals in respect of flood risk and responsibilities to mitigate risks to health and the natural environment arising from land contamination and pollution.

Other legislation and guidance

- 5.7.8. The Applicant’s Planning Statement sets out the national, regional and local planning policies that are considered relevant to the Proposed Development [APP-693]. The legislation and guidance relevant to Water Resources and Flood Risk effects is set out in the ES Chapter 20 [APP-233, Section 20.2] and for Ground Conditions and Contamination in the ES Chapter 19 [APP-232, Section 19.2]. Key legislation and policy are identified in Chapter 3 of the ES [APP-216].
- 5.7.9. The WFD is important and relevant to consideration of this Application. It establishes a legislative framework for the protection of surface waters and groundwater. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 transposes the WFD into law in England and Wales. In considering an application for development the SoS has a specific duty under NPS EN-1 to be satisfied that the Proposed Development has had regard to the relevant River Basin Management Plan (RBMP) or plans; and any supplementary plans made under it; and meets the requirements of the WFD. The Anglian River Basin District:

River Basin Management Plan (2015) applies to this Proposed Development.

- 5.7.10. North Norfolk District Council's (NNDC's) Development Management Policy EN10 – 'Development and Flood Risk' applies to this Proposed Development. Policy EN 9 on Biodiversity Appendix B (North Norfolk Ecological Network) recognises the importance of the chalk rivers in the district. This is discussed in Section 5.6 of this Recommendation Report (Terrestrial biodiversity, biological environment and ecology).

The application

Environmental Statement

- 5.7.11. The Applicant's assessment of impacts on Water Resources and Flood Risk is set out in ES Chapter 20 [APP-233] and of impacts on Ground Conditions and Contamination in the onshore environment in ES Chapter 19 [APP-232]. Both of these chapters are supported by appendices that contain figures, technical reports and details of consultation and data collection.
- 5.7.12. Embedded mitigation that is common across the onshore part of the project is set out in Section 5.1 of this Recommendation Report. Embedded mitigation for effects on Water Resources and Flood Risk is described in ES Section 20.7.1 [APP-233] and the Schedule of Mitigation [APP-688, superseded by REP18-017] which tabulates how mitigation measures are secured in the dDCO, and these include commitments to:
- a. use of SuDS including attenuation of surface water run-off at the proposed onshore project substation (Scenarios 1 and 2) and the proposed National Grid substation extension;
 - b. sediment management during construction of the onshore cable route; and
 - c. trenchless crossing techniques at major watercourses under Scenario 2 (under Scenario 1, ducts at watercourse crossings would have been constructed by the Norfolk Vanguard OWF project).
- 5.7.13. Embedded Mitigation for effects on Ground Conditions and Contamination is described in ES Section 19.7.1 and Table 19.14 [APP-232] and summarised in the Schedule of Mitigation [APP-688, superseded by REP18-017]. This includes sectionalised duct installation along the onshore cable corridor and trenchless crossing techniques at major watercourses (under Scenario 2).
- 5.7.14. Additional mitigation for effects on Water Resources and Flood Risk is detailed in Sections 20.7.1 and 20.7.4 of ES Chapter 20 [APP-233] and for effects on ground conditions and contamination is detailed in Sections 19.7.4 of ES Chapter 19 [APP-232].
- 5.7.15. The Applicant's assessment in Chapter 19 concluded that there is low potential for significant ground contamination to be present within the study area [APP-232 Section 19.6.2]. The ES concludes that residual

potential impacts resulting from construction disturbance of potentially contaminated land would be no worse than minor adverse and therefore not significant in EIA terms after additional mitigation secured as part of a Contaminated Land and Groundwater Plan and a Site and Excavated Waste Management Plan as daughter plans to the Code of Construction Practice (CoCP) secured by dDCO Requirement 20 (R20) [APP-232 Section 19.7.4.6].

- 5.7.16. Under either Scenario 1 or Scenario 2 potential effects on the principal groundwater aquifer as a result of disturbance of contamination, trenchless crossing techniques or piling is considered to be moderate to major adverse before mitigation, however after additional measures to mitigate effects on Source Protection Zones (SPZ) SPZ1 and SPZ2 (secured by dDCO R20), the residual effects after mitigation under both scenarios are assessed by the Applicant in ES Chapter 19 to be minor adverse [APP-232 Section 19.7.4].
- 5.7.17. This additional mitigation would be secured by dDCO R20 within a Code of Construction Practice (CoCP) to be agreed post-consent with the relevant authority, and would be based on the Environment Agency's Pollution Prevention Guidance and would include the following secured daughter plans:
- a. Contaminated Land and Groundwater Plan;
 - b. Construction Surface Water and Drainage Plan (CSWDP);
 - c. Site and Excavated Waste Management Plan (SEWMP); and
 - d. Materials Management Plan (MMP).
- 5.7.18. The Outline Code of Construction Practice (OCoCP) requires ground excavation work to be designed to minimise groundwater disturbance. If works are required in SPZ1 or SPZ2 areas, best available techniques would be adopted, in accordance with the Energy Network Engineering Recommendations [APP-688, superseded by REP18-017].
- 5.7.19. The dDCO also secures under R25 site-specific watercourse crossing plans to be produced and agreed post-consent with the relevant authority that would mitigate effects including direct disturbance of water bodies and increased sediment supply.
- 5.7.20. The ES Chapter 20 assessed two potential residual effects of construction as moderate adverse after mitigation and therefore considered significant:
- a. effects associated with open-cut watercourse crossings within certain sub-catchments reflecting the worst case of construction of multiple permanent culverts [APP-233 paras 125 to 127 and Tables 20.22 and 20.23]; and
 - b. effects of increased sediment supply from duct installation and watercourse crossings [APP-233 paras 145 to 146 and Table 20.28].
- 5.7.21. Potential residual effects to human health (including construction workers and general public) associated with localised potential sources of

contamination identified within the study area (primarily in relation to railway land and to the site of a 1996 plane crash) are assessed in the ES to be minor adverse after mitigation and not significant [APP-232 Section 19.7.4.6].

- 5.7.22. Matters concerning potential effects on human health and biodiversity are reported in more detail in Section 5.8 (Socio-Economic Effects) and 5.6 (Terrestrial biodiversity, etc.) of this Recommendation Report.

WFD Assessment

- 5.7.23. The ES confirms that the Proposed Development lies within the Anglian River Basin District: River Basin Management Plan (2015). The Applicant's WFD compliance assessment is set out in ES Appendix 20.2 which concludes that, subject to control measures set out in that document, the Proposed Development is compliant with the requirements of the WFD [APP-587, Tables 6.1, 7.1 and para 131-133]. In summary, it assesses that after mitigation there would be no non-temporary effects sufficient to result in deterioration in status of the water bodies and groundwater assessed, nor prevention of objectives being achieved.
- 5.7.24. The control measures proposed in regard to the water environment and ground conditions are described above and would be secured in the CoCP and its daughter plans under R20 of the dDCO. A hydrogeological risk assessment meeting the requirements of Groundwater Protection Principles and Practice (GP3) (Environment Agency, 2017), would be undertaken for any trenchless crossing locations in SPZ1 or SPZ2 areas. Potential effects to watercourses resulting from the use of temporary culverts at watercourse crossings would be mitigated by appropriate design of size and level of culverts
- 5.7.25. ES Chapter 9 covers Marine Water Quality and Sedimentation [APP-222] supported by Appendix 9.1 Water Framework Directive Compliance Assessment-Marine WFD Water Bodies [APP-554]; these matters are covered in this Recommendation Report at Sections 5.9 Marine biodiversity etc. and 5.10 Marine and Coastal Processes.

Flood Risk Assessment

- 5.7.26. The onshore project area falls under the authority of Norfolk County Council (NCC) which is the Lead Local Flood Authority (LLFA) and the following local authorities: Breckland Council; Broadland District Council; and NNDC. The Proposed Development would also cross main rivers, which are under the authority of the Environment Agency. The area of the Proposed Development lies within the Internal Drainage District (IDD) of the Norfolk Rivers Internal Drainage Board (IDB) and is in close proximity to that of the Broads (2006) IDB (which have together taken part in this Examination under the auspices of the Water Management Alliance (WMA)); and the Proposed Development lies within the watershed catchments of both IDBs.
- 5.7.27. The Applicant's FRA is documented in ES Appendix 20.1 Flood Risk Assessment which reports that the proposed onshore substations, the

landfall and the construction mobilisation areas are all located within Flood Zone 1, with low fluvial or surface water flood risk. The Applicant concludes that this 'Essential Infrastructure' development is deemed acceptable under the Sequential Test [APP-586].

- 5.7.28. The Applicant's FRA also reports that the onshore cable route would pass primarily through Flood Zone 1, with a small number of locations in Flood Zone 2 and 3 associated with watercourse crossings or topographically low-lying areas (including two trenchless crossings within Flood Zone 2 and four within Flood Zone 3, due to the associated river crossings) [APP-586].

Inter-related effects and interactions

- 5.7.29. ES Chapter 20 assesses likely inter-related adverse effects arising from the impact of the Proposed Development on water resources and flood risk receptors as follows [APP-233, Table 20.45]:
- a. potential effects to designated surface waters could impact upon ecological receptors supported by these features as assessed in ES Ch 22 Onshore Ecology (covered in Section 5.6 of this Recommendation Report); and
 - b. potential effects on ground conditions as covered in ES Ch 19 Ground Conditions and Contamination could affect groundwater and hydrologically connected surface waters (as discussed below in this Section 5.7).
- 5.7.30. The ES [APP-233 para 249 and Table 20.46] reports that the potential for effects to interact with each other which could produce synergistic impacts which are taken account of in the worst case assessments, as follows:
- a. during construction, direct disturbance of water bodies interacting with effects of increased sediment supply, accidental release of pollutants or changes in surface water drainage and flood risk; and
 - b. during operation at the substation site, supply of sediments interacting with increased surface water run-off and changes to groundwater flows or flood risk.

Potential cumulative impacts and effects

- 5.7.31. ES Chapter 19 concludes that cumulative residual effects on ground conditions and contamination together with the Hornsea Project Three OWF project would be limited to a negligible magnitude.
- 5.7.32. ES Chapter 20 concludes that there is the potential for minor to moderate adverse cumulative residual effects during construction under Scenario 2 from direct disturbance of surface watercourses for the Blackwater Drain, River Bure and River Wensum sub-catchments where construction activities from Norfolk Boreas Scenario 2 and Hornsea Project Three are both proposed to take place, based on a worst case assumption of multiple culverted crossings, whilst the impact of individual crossings would not result in significant effects [APP-233, paras 224 to 226 and para 252].

- 5.7.33. ES Chapter 20 also concludes that there is the potential for minor to moderate adverse cumulative residual effects during construction under Scenario 2 of increased sediment supply when assessed on a whole sub-catchment basis for the Blackwater Drain, River Bure and River Wensum sub-catchments where construction activities from the Proposed Development Scenario 2 and the Hornsea Project Three OWF are both proposed to take place [APP-233, paras 230 to 232].
- 5.7.34. Under Scenario 1, the worst case effects of direct disturbance to watercourses and increased sediment supply arising from works to install transmission cable ducts would have been undertaken by the Norfolk Vanguard OWF project, for which an Order has been made.
- 5.7.35. For Scenario 1, cumulative additional impacts on ground conditions and contamination during construction with the Norfolk Vanguard OWF and the Hornsea Project Three OWF projects were assessed by the Applicant in ES Chapter 19 as negligible after mitigation [APP-232, Section 19.8.1].

Decommissioning

- 5.7.36. The Applicant states that full EIA would be carried out ahead of any decommissioning works being undertaken for the onshore project substation and would be in line with relevant policy and legislative requirements at that time. The time schedule for decommissioning would be similar in duration to the construction phase of 24 to 30 months. [APP-218, Sections 5.6.3.8, 5.7.3.8]. The Applicant states that decommissioning of onshore cables would also be subject to industry best practice, rules and legislation prevailing at the time; and that it is likely that cables would be removed from the ducts and recycled, with jointing pits and ducts capped, sealed and left in-situ [APP-218, Section 5.6.2.7].
- 5.7.37. The Applicant states that detail and scope of the decommissioning works would be determined by the relevant legislation and guidance in force at the time of decommissioning, and a decommissioning plan would be provided and would need to be agreed with the regulator. As such, cumulative impacts on ground conditions and contamination during decommissioning are assumed by the Applicant to be the same as those identified during the construction stage [APP-232, section 19.7.6]. The Applicant assesses that decommissioning impacts on the water resources and flood risk receptors would be no worse than assessed for construction under either scenario and decommissioning works could be subject to a separate licencing and consenting process [APP-233, para 208-209].

Local Impact Reports

Norfolk County Council

- 5.7.38. In its LIR [REP2-085] NCC agrees that the approach laid out in the Outline Operational Drainage Plan (OODP) [APP-712] is acceptable to the

LLFA in principle, noting dDCO requirements which enable surface water drainage matters to be resolved post-consent through an Operational Drainage Plan (ODP) secured under R32; a Code of Construction Practice (R20); and site-specific Watercourse Crossing plans (R25).

District Councils

- 5.7.39. North Norfolk District Council's (NNDC) LIR [REP2-087] defers to the expert advice of the Environment Agency, NCC as LLFA in respect of local flood risk management; and Norfolk Rivers IDB.
- 5.7.40. Broadland District Council's (Broadland DC) LIR [REP2-065] defers to NCC on water resources and flood risk matters.
- 5.7.41. Breckland Council's LIR [REP2-062] defers to NCC on matters relating to flood risk.

Issues

- 5.7.42. The following issues concerning effects of construction on the water environment, flood risk and ground conditions and contamination are reported below:
 - a. potential for bentonite breakout from trenchless crossings;
 - b. effects of multiple permanent culverts for open-cut watercourse crossings;
 - c. effects of construction on surface water fed by groundwater;
 - d. disturbance of 1996 air crash site;
 - e. effects to field drainage at substation sites in relation to climate change;
 - f. Sustainable Drainage Strategies (SuDS);
 - g. surface water run-off at substation sites;
 - h. effects on surface water drainage and flood risk during construction;
 - i. Article 15(6) wording regarding environmental permitting;
 - j. proposed disapplication of secondary consents;
 - k. Flood Risk Assessment;
 - l. Water Framework Directive compliance; and
 - m. cumulative impacts.
- 5.7.43. The ExA examined these issues with reference to the appropriate legislation and policies described in Chapter 3, through written questions, site inspections and in an ISH on Thursday 21 January 2020 [EV6-001 to EV6-008].

Potential for bentonite breakout from trenchless crossings

- 5.7.44. The EA expressed concerns in respect of potential for adverse impacts on groundwater quality in the principal aquifer (including SPZ areas) from trenchless crossings and particularly potential for bentonite breakout from horizontal directional drilling (HDD) [RR-095].
- 5.7.45. NE advised that a commitment to use best available techniques and a precautionary methodology should be adopted and that the worst case

scenario environmental impacts of potential bentonite breakout should be assessed by the Applicant, with particular attention to the floodplain of the River Wensum [RR-099].

- 5.7.46. In response, a clarification note on trenchless crossing was provided by the Applicant [REP1-039]. This explained that site-specific measures to contain any breakout of drilling fluid would be detailed in a contingency plan post-consent to be included in the final Code of Construction Practice (CoCP), developed in consultation with Natural England and the Environment Agency. This is secured under R20 of the dDCO to be in accordance with the Outline CoCP (OCoCP) which is a certified document under the dDCO and in which the mitigation for HDD breakout is outlined at Section 11.1.6 [REP18-019]. NE confirmed in its SoCG that it is satisfied with detail provided in the Clarification Note and Method Statement and a significant effect on the River Wensum from HDD breakout would be unlikely following mitigation [REP16-010].
- 5.7.47. In answer to WQ2, the EA confirmed that having reviewed the Applicant's methodology for trenchless crossings the EA is satisfied that trenchless crossings could be undertaken without contamination to water resources, recognising that drilling fluids would be inert and 'breakout' monitoring would be in place to stop any breakout of drilling fluids as soon as possible [REP5-070].
- 5.7.48. The Applicant subsequently confirmed that the updated OCoCP commits the Applicant to undertaking more detailed hydrogeological risk assessments for any trenchless crossings proposed in SPZ1 or SPZ2 post-consent as part of pre-construction investigations and in accordance with Groundwater Protection Principles and Practice (GP3) (Environment Agency, 2017) and in consultation with the Environment Agency [REP6-014].
- 5.7.49. The SoCG with the EA also agreed that the locations for trenchless crossings detailed in dDCO R16(13) are appropriate; that details would be agreed at each location post-consent; and that R20 of the dDCO secures a breakout contingency plan to be included in the CoCP [REP16-007]. This agreement was conditional on wording being added to the OCoCP to include reference to informing the EA response team. The EA confirmed that it is satisfied that the revised wording of the OCoCP properly secures mitigation of effects arising from watercourse crossings [REP10-056, Q4.15.0.2]. The ExA is satisfied that the requisite wording is in fact included in the final revision of the OCoCP at D16 [REP16-012].
- 5.7.50. The ExA is therefore satisfied that adequate mitigation of potential adverse effects of trenchless crossing construction on the water environment is secured through R20 of the dDCO and the ExA does not consider potential adverse effects on the water environment of bentonite breakout from construction of trenchless watercourse crossings as a factor that would prevent the making of the Order.

Effects of multiple permanent culverts for open-cut watercourse crossings

- 5.7.51. In its RR, the EA expressed concerns in respect of assessed adverse effects of construction of crossings of watercourses and notably from crossings of two chalk rivers, the Bure and the Wensum; the EA emphasised the need for site-specific watercourse crossing plans to be produced by the Applicant [RR-095].
- 5.7.52. In answer to WQ1, the Applicant clarified that the ES assessment of moderate residual adverse effects on the water environment in the River Bure and River Wensum catchments under Scenario 2 (due to direct disturbance of water bodies and increased sediment supply from open-cut watercourse crossings) is based on a worst case of multiple permanent culverts being constructed within a river basin sub-catchment [REP3-003, Q16.1.1]. The Applicant also confirmed that permanent culverts would only be needed where it is not possible to use a temporary watercourse crossing technique for watercourses 1.5m or deeper and that individual trenched crossings would not result in significant effects [REP3-003, Q16.1.1].
- 5.7.53. In response to WQ2 the EA confirmed its understanding that the assessment of adverse effects is based on a worst case and that it understood that culverts would be avoided wherever possible and the EA expects refined conceptual site models to be included in a site-specific plan for each watercourse crossing. The EA noted that whilst for multiple reasons its policy strongly discourages building new permanent culverts, it expects the Applicant to demonstrate in each specific case why culverting is "*both necessary and the only reasonable and practicable alternative*", and where permanent culverts are shown to be required then additional mitigation and compensation for ecological impacts would be required [REP5-070, Q2.15.0.2].
- 5.7.54. The Applicant confirmed that in Section 11 of the updated OCoCP it commits to develop a scheme for each crossing with site specific details for sediment management, pollution prevention measures, appropriate ecological enhancements and post-construction monitoring, supported by a pre-construction record of baseline conditions, and each scheme would be submitted to the relevant planning authority for approval in consultation with NE, secured by R25 of the dDCO [REP6-014, Q2.15.0.2].
- 5.7.55. In its SoCG the EA confirmed that, should the DCO be made, the post-consent development and approval post-consent of a CoCP would provide appropriate control for each stage of the works; [REP16-007]. The EA also agreed the wording of the updated OCoCP produced at Deadline 5, subject to the inclusion of the EA as a consultee in the approval of the final CoCP [REP16-007]. This was subsequently added to the OCoCP [REP18-020, paras 154 and 186]. The EA also welcomed the Applicant's commitment to further investigation and development post-consent of site-specific conceptual models, and confirms that the EA requires to review and comment on the refined conceptual site models prior to construction to clarify the potential impacts on controlled waters and proposed mitigation measures [REP16-007].

- 5.7.56. The EA also agreed that should the DCO be made, the development of a CoCP and a Construction Surface Water and Drainage Plan (CSWDP) post-consent is appropriate mitigation to protect sensitive water bodies from the effects of sediment and soil mobilisation within the working areas [REP16-007]. The ExA is satisfied that this mitigation is satisfactorily secured through R20 and R25 of the rDCO and under the OCoCP Section 11.1 [REP18-020].
- 5.7.57. The ExA has carefully reviewed this issue, and having considered the Applicant's and the EA's representations responses during the Examination the ExA accepts that the worst case scenario is conservative as EA policy strongly discourages building new permanent culverts and refined conceptual site models and detailed mitigation measures must be agreed with the EA for each watercourse crossing prior to construction, and therefore the ExA is content that significant residual adverse effects from individual watercourse crossings are unlikely for the reasons given in the ES Chapter 20 (APP-233).
- 5.7.58. However the ExA also notes the ES assessment of moderate adverse residual effects of construction more generally for the East Ruston Stream, River Bure, Blackwater Drain and Wendling Beck sub-catchments *"are based on a worst case scenario which reflects the cumulative impact of construction activities (e.g. cable trenching and watercourse crossings) within each sub-catchment, rather than the potential impacts on any individual watercourse. When assessed alone, potential impacts on the individual watercourses which make up each sub-catchment are not considered to give rise to significant effects"* [APP-233, para 146]. The ExA notes that there has been no disagreement with this specific assessment regarding sediment supply under Scenario 2.

Effects of construction on surface water fed by groundwater

- 5.7.59. The ES Chapter 19 concludes that potential impacts of construction on surface water fed by groundwater under both scenarios is expected to be negligible to minor adverse and therefore not significant in EIA terms. The EA considered that this matter had not been addressed sufficiently and further risk assessment was needed [RR-095]. The Applicant confirmed that a preliminary Conceptual Site Model has been submitted as Appendix 19.2 of the ES [APP-584] which identifies potential contamination sources, pathways, receptors and effects, however specific mitigation measures would be developed for each site following ground investigation [AS-024].
- 5.7.60. In response, the EA said that, prior to construction, it would wish to review and comment on the Applicant's further assessment of impacts of construction and effects of contaminants on quality of surface water fed by groundwater [REP2-070]. The Applicant responded that the EA would be consulted on further investigations and on refined conceptual site models prior to construction, secured through dDCO R20(2)(d) [REP3-003, Q16.2.3].

- 5.7.61. In its SoCG the EA confirmed that, should the DCO be made, the post-consent development and approval post-consent of a CoCP would provide appropriate control for each stage of the works; [REP16-007]. The EA also agreed the wording of the updated OCoCP produced at Deadline 5, subject to the inclusion of the EA as a consultee in the approval of the final CoCP; and the clarification that the EA emergency response teams must be notified of spillage or potential contamination of watercourses or drains [REP16-007]. These were subsequently added to the OCoCP [REP18-020, paras 154 and 186]. The EA also welcomed the Applicant's commitment to further investigation and development post-consent of site-specific conceptual models, and confirms that the EA requires to review and comment on the refined conceptual site models prior to construction to clarify the potential impacts on controlled waters and proposed mitigation measures [REP16-007].
- 5.7.62. The ExA understands from responses made by the EA as noted above that it now accepts the Applicant's assessment in ES Chapter 19 that potential impacts of construction on surface water fed by groundwater under both scenarios is expected to be negligible to minor adverse and therefore not significant in EIA terms. The ExA is satisfied that the proposed mitigation is secured through rDCO R25 and the OCoCP Section 6.1 under dDCO R20 [REP18-020 para 102].

Disturbance of site of 1996 air crash

- 5.7.63. RRs were made by a local landowner and by the MP for Mid Norfolk about potential adverse impact to the aquifer due to construction disturbance of land in the area of a 1996 Royal Danish Air Force (RDAF) military aircraft crash [RR-042 and RR-109]. The ExA explored these IP concerns at ISH3 [EV6-002 to EV6-007]. The Applicant responded that the crash site is not designated as a contaminated site by the local authority or the EA and that post-consent ground investigations and further risk assessment would be undertaken [REP4-013 Page 22]. The EA confirmed subsequently that it was satisfied that the requirement for EA approval to the CoCP at each stage secured through R20 provides the EA with a means of checking the adequacy of proposed methods and timeframes [REP7-062].
- 5.7.64. At OFH3 a local IP again raised the issue of potential radiological contamination at the crash site [REP14-082]. The Applicant confirmed that it has amended the OCoCP to confirm that in the area of the historic military jet crash contamination investigations would include a radiological investigation by a specialist contractor [AS-080]. The ExA is satisfied that this amendment securing radiological investigation has been made to the OCoCP [REP18-020, para 102]. The SoCG with the EA confirmed agreement that the Applicant's proposed approach secures appropriate measures to be approved by the EA for managing the discovery of potential contamination and this is secured by the OCoCP para 102 and R20 of the dDCO [REP16-007 Page 17]. The ExA therefore considers this issue to be resolved.

Effects to field drainage at substation sites

- 5.7.65. A local IP raised a concern about effects to agricultural land drainage that would be affected by constructing the proposed project substation and grid substation extension [RR-038]. The Applicant responded that, should the DCO be made, the CSWDP would be developed and agreed with the relevant drainage authorities post-consent and implemented to ensure continuity of drainage of surrounding land, and secures that existing land drains at the onshore project substation would be reinstated following construction. This is secured through the OCoCP Section 11.1.7 [REP18-020].
- 5.7.66. The SoCG with NFU/LIG agreed that suitable wording securing mitigation for effects to land drainage and soil aftercare has now been included in the OCoCP and that the SoCG would be an Appendix to the voluntary Deed of Easement documentation with landowners [REP18-031]. This is reported further in Chapter 8 of this Recommendation Report. The ExA is satisfied that a detailed CSWDP is secured by R20(2)(i) of the rDCO.

Sustainable Drainage Strategies (SuDS)

- 5.7.67. The ExA notes that the OODP, proposed as a certified document in the dDCO, commits the undertaker to develop a drainage strategy according to the principles of the SuDS discharge hierarchy and to develop within the final ODP a maintenance and management plan detailing the activities required and details of who would adopt and maintain all the surface water drainage features for the lifetime of the development [APP-712, paras 8 and 18].
- 5.7.68. In response to WQ2, the Applicant reported that the Design and Access Statement (DAS) [REP14-014] has been updated to provide further reference to the operational drainage design and Table 4.3 of the DAS sets out the Design Principles including the development of the SuDS drainage strategy, and the DAS and the Outline Landscape and Ecological Management Strategy (OLEMS) [REP14-021] (both of which are listed as certified documents under the dDCO) include cross-reference to the ODP and reference to the SuDS requirements [REP5-045, Q2.15.0.6]. NCC agreed that dDCO R32 provides appropriate and adequate security for the final ODP to be developed in consultation with NCC according to the principles of the OODP [REP16-012]. The ExA is satisfied that SuDS has been given appropriate attention in the Proposed Development, that sustainable drainage strategies would be applied where appropriate, and that suitable security is provided in the dDCO.

Surface water run-off attenuation at substation sites in relation to climate change

- 5.7.69. A local IP submitted photographic evidence to support their concerns about flood risk downhill from the sites of the proposed onshore project substation and grid substation extension, in relation to discharge from surface water attenuation ponds [REP4-052] and [REP16-018].
- 5.7.70. The Applicant clarified that a post-consent ODP, to be approved by the local planning authority following consultation with EA and NCC, would define site-specific methods for discharging surface water at the onshore

project substation and would provide details of who would adopt and maintain all the surface water drainage [REP5-045]. The Applicant also confirmed that the OCoCP has been updated at Section 13, para 188 to refer specifically to a Flood Warning and Evacuation Plan (FWEP), which would be produced post-consent as part of the Environmental Emergency/Incident and Response Plan (EEIRP) [REP5-045, Q2.15.0.9].

- 5.7.71. In regard to the design capacity of surface water attenuation at the proposed substations, WQ2 asked the EA and the Applicant to clarify the allowance made for climate change above that required for a 1-in-100-year storm event [PD-009]. The EA confirmed that if the development would be decommissioned before year 2070, then 20% is the correct allowance [REP7-062]. The 20% figure was also agreed in the SoCG with NCC as LLFA [REP9-015].
- 5.7.72. The ExA is satisfied with the clarifications made by the Applicant and that the ODP is secured by R32 of the rDCO and the FWEP as part of the EEIRP is secured through the CoCP under R20 of the rDCO. The ExA is therefore satisfied that this issue is resolved.

Effects on surface water drainage and flood risk during construction

- 5.7.73. The National Farmers Union (NFU), together with the Land Interest Group (LIG) of agents acting for landowners, raised a concern about how any increase in surface water run-off from the haul road or the construction compounds would be dealt with during construction [RR-044].
- 5.7.74. The Applicant explained that the OCoCP acknowledges that, should the DCO be made, a detailed Surface Water and Drainage Plan (SWDP) would be required to be developed and agreed with regulators post-consent, based on information about existing land drainage arrangements gathered from landowners [AS-024]. The SoCG with NFU/LIG subsequently agreed additional wording to be included within the OCoCP at Section 17.2 securing liaison with landowners via an Agricultural Liaison Officer (ALO) prior to any discharge to existing drains [REP18-031]. The ExA is satisfied that such wording has been added and that this issue is resolved and that the rDCO secures a SWDP to be developed and agreed for agreement with the relevant regulators post-consent, by means of the OCoCP under R20(2)(i).

Article 15(6) wording regarding environmental permitting

- 5.7.75. WQ1 asked IPs to check dDCO Schedules and provide the ExA with any suggested amendments. The EA responded that in Article 15(6), it would prefer the wording "*Nothing in this article overrides the requirement for an environment permit under Regulation 12 of the Environmental Permitting (England and Wales) Regulations 2016 insofar as the discharge activity comes within the definition contained within the said Regulations*". [REP2-070, Q5.0.4]. The ExA notes that this relates to environmental permitting of discharge into controlled waters and is

satisfied that the requested wording was substituted by the Applicant in the dDCO [REP10-010] and is duly included in the rDCO.

Proposed disapplication of secondary consents in relation to land drainage

- 5.7.76. WQ2 asked IPs to confirm their satisfaction with the Applicant's explanation for the proposed disapplication under dDCO Article 7(3) of secondary/ additional consents in regard to land drainage [AS-024 table 15 item 5].
- 5.7.77. NCC noted that dDCO Article 7 (3) would in effect disapply some provisions of the Water Resources Act 1991 (as amended) and certain byelaws under the Land Drainage Act 1991 that require consent or approval for the carrying out of works. NCC stated that it was not content with the Applicant's explanation and confirmed that works to any watercourse crossing would need consent from the appropriate authority for the type of watercourse [REP7-038, Q2.15.01]. NCC questioned whether the approval of plans is a sufficient control mechanism and noted that the LLFA would also require a consent application; and also questioned whether the Schedule 17 Part 7 (Protective Provisions) adequately provides for the requirements a drainage authority may make [REP7-038, Q2.15.01].
- 5.7.78. The Applicant re-affirmed that dDCO Schedule 17 Part 7 provides for approval of detailed plans for drainage and works to watercourses by the EA and the relevant drainage authorities and thus provides a process for the authority to "*request further measures to safeguard flood defences and avoid damage to the watercourse...*" [REP8-014].
- 5.7.79. The Applicant also reiterated that dDCO R25 provides security for the prior approval to any works to a designated main river or ordinary watercourse crossing plans by the relevant planning authority in consultation with NCC, the EA, NE and the relevant drainage authority [REP8-014]. The Applicant added the word "*relevant*" before "*drainage authority*" in Schedule 17 Part 7 of the dDCO in order to encompass the drainage authority relevant to the type of watercourse [REP18-010], [REP18-027].
- 5.7.80. NCC did not respond to the Applicant's explanation in any of its subsequent submissions to the Examination and their SoCG was silent on this issue of secondary consents for drainage works [REP16-012]. That SoCG merely states:
- "*The County Council confirms that for ordinary watercourses that are to be crossed by open cut trenching or where any other temporary works proposed as part of this project are likely to affect flows in an ordinary watercourse, then the Applicant would need the approval of Norfolk County Council.*"
- 5.7.81. While the ExA cannot draw a conclusion on the NCC's final position on this issue, the ExA is satisfied that the WMA confirmed satisfaction with the proposed disapplication of legislation subject to the addition to the

dDCO Protective Provisions of the words "...total volume or..." [REP7-065] and the ExA confirms that those words have indeed been added in dDCO Schedule 17 Part 7, 72(c) [REP18-010], [REP18-027].

- 5.7.82. The EA also agreed the suitability of the Schedule 17 Part 7 Protective Provisions as amended [REP16-007]. Therefore, the ExA is satisfied that the ability of the relevant drainage authorities to control works to watercourses is secured under the rDCO Article 15 and Schedule 17 part 7 as well as by specific plans secured under R20(2)(i), R25 and R32 and the agreed wording is included in the rDCO.

Flood Risk Assessment

- 5.7.83. NCC as LLFA confirmed it has no concerns about an increase to baseline local flood risk [REP9-015]. The EA, in its capacity as Flood Risk Management Authority with a general supervisory duty relating to flood risk, raised no concerns with the application in regard to Flood Risk Assessment and agreed [REP16-007] that:
- a. the Applicant has had due regard to the appropriate legislation, planning policy and guidance relevant to water resources and flood risk; and
 - b. the OCoCP and daughter plans secured as certified documents in the rDCO are considered appropriate and adequate for managing flood risk.
- 5.7.84. Regarding the application of the FRA Sequential Test and Exception Test it is for the decision-maker to confirm whether they agree that the project satisfactorily passes both tests. The ExA is satisfied that the Sequential Test has been applied as part of site selection; and that:
- a. a sequential approach has been used to locate the most vulnerable uses to areas of lowest flood risk; and
 - b. there may in some cases be no reasonable alternative sites on previously developed land for works compounds due to the necessity for locating compounds adjacent to the trenchless crossings (NPS EN-1 para 5.7.16).
- 5.7.85. In regard to the Exception Test for those parts of the cable route lying within Flood Zones 2 or 3, the ExA notes that there is a risk of temporarily increasing flood risk due to temporary trenchless crossing construction compounds located in Flood Zones 2 or 3, but the ExA agrees that it would be sound and reasonable for the SoS to grant consent because:
- a. the Proposed Development would deliver wider sustainability benefits to the community which outweigh flood risk (NPS EN-1 para 5.7.17);
 - b. the temporary compounds would be removed and returned to their former state; and
 - c. the nature and degree of increased flood risk from these temporary compounds in flood zones 2 and 3 would be limited and

can be mitigated to an acceptable level (NPS EN-1 para 5.7.16 and 17).

- 5.7.86. The ExA is therefore satisfied that the application is supported by an appropriate FRA and that the Sequential and Exception Tests have both been satisfactorily applied and passed as described above; that the proposal is in line with relevant flood risk management strategies; and in flood risk areas the project is appropriately flood resilient.
- 5.7.87. In the SoCGs with the EA, NCC and Anglian Water Services Ltd it was agreed that the ES adequately characterises the baseline environment in terms of water resources and flood risk; and that the mitigation proposed for managing flood risk is "*appropriate and adequate*" [REP16-007, REP16-012 and REP9-017 respectively]. The ExA notes that the IDBs have raised no objections to the Applicant's consideration and conclusions in respect of impacts on flood risk.
- 5.7.88. Therefore, the ExA does not consider flood risk in regard to the Exception Test for temporary trenchless crossing construction compounds located in Flood Zones 2 or 3 as a factor that should weigh against the making of the Order.

Water Framework Directive compliance

- 5.7.89. There has been no IP disagreement with the conclusion of the Applicant's WFD assessment that following the application of control measures to mitigate impacts on water bodies, construction stage activities under either Scenario 1 or 2 would not cause deterioration in the status of any river water bodies or prevent WFD objectives being achieved for the project alone or cumulatively [APP-587 paras 89, 93, 106, 118, 126, 128, 131 and 132].
- 5.7.90. In the SoCG with the EA it was agreed that the conclusions of the WFD assessment in the ES (as reported above) are appropriate, and that the development of the CoCP (as secured by the dDCO under R20) in consultation with the EA (in accordance with their responsibilities under the WFD) is an appropriate level of pollution control [REP16-007, page 10, page 25]. Therefore, based on the findings of the EA the ExA is satisfied that the Proposed Development meets the requirements of the WFD and has had appropriate regard to the relevant RBMP.

Cumulative impacts

- 5.7.91. The EA agrees with the Applicant's assessment in ES Chapter 19 that cumulative residual effects on ground conditions and contamination are likely to be non-significant in EIA terms [REP16-007].
- 5.7.92. The EA also agrees with the Applicant's assessment in ES Chapter 20 of residual cumulative impacts of both scenarios [REP16-007]:
- a. Under Scenario 1, the worst case effects of direct disturbance to watercourses and increased sediment supply arising from works to install transmission cable ducts would have been undertaken by

the Norfolk Vanguard OWF project, for which an Order is already made.

- b. Under Scenario 2 the cumulative impact of direct disturbance of surface watercourses for the Blackwater Drain, River Bure and River Wensum sub-catchments, where construction activities from the Proposed Development and the Hornsea Project Three OWF project are both proposed to take place, is assessed to be minor to moderate adverse after mitigation based on a worst case assumption of multiple culverted crossings within a sub-catchment [APP-233, paras 224 to 226 and para 252]. However as reported above at paras 5.7.46 to 51, the ExA understands from responses made by the EA that it accepts the Applicant's assessment that significant adverse residual effects would only occur on a worst case basis that is unlikely to materialise if multiple permanent new culverts can be avoided or additional mitigation delivered, which would be agreed with the EA and NE in site-specific watercourse crossing plans. The ExA is satisfied that the proposed mitigation is secured through rDCO R25 and the OCoCP Section 11.1 under rDCO R20 [REP18-020 para 102].
- c. Under Scenario 2 the cumulative impact of construction activities such as earthworks, the removal of surface vegetation cover and soil storage may give rise after mitigation to minor to moderate adverse effects of increased sediment supply to surface watercourses where construction activities from the Proposed Development and the Hornsea Project Three OWF project are both proposed to take place within the River Bure, River Wensum and Blackwater Drain sub-catchments, and thereby are likely to give rise to significant adverse effects [APP-233, paras 230 to 232].

- 5.7.93. There has been no IP disagreement with the conclusion of the Applicant's WFD assessment that following the application of control measures to mitigate impacts on water bodies, construction stage activities under either Scenario 1 or 2 would not cause deterioration in the status of any river water bodies or prevent WFD objectives being achieved for the project alone or cumulatively [APP-587 paras 89, 93, 106, 118, 126, 128, 131 and 132].

Conclusions

- 5.7.94. Based on evidence examined above, the ExA concludes that the Proposed Development complies with relevant policy as follows:

Pollution control regulatory regime

- a. In accordance with NPS EN-1 para 4.10.7, the ExA is satisfied that no concerns remain from the relevant authorities about their ability to regulate adequately potential releases of pollutants into the ground and water environment under the pollution control regulatory framework.

Flood risk

- b. In accordance with NPS EN-1, para 5.7.9 the application is supported by an appropriate FRA and the Sequential and Exception Tests have

both been satisfactorily applied and passed and where it has a footprint in flood risk areas the Proposed Development would be appropriately flood resilient and resistant; and in accordance with NPS EN-5, Para 2.4.1 the Applicant has set out to what extent the Proposed Development would be resilient to effects of climate change on flood risk.

- c. In accordance with NPS EN-1, paras 5.7.10 and 5.7.19 the Applicant has given adequate attention to the use of and security for maintenance of SuDS.
- d. In accordance with NPS EN-1, paras 5.7.17 and NPS EN-5 para 2.4.1 the Applicant has taken account of climate change adaptation in its ES and outline design proposals in relation to potential flooding and flood risk

Water quality and resources

- e. In accordance with NPS EN-1 section 5.15.2 to 5.15.6, the Applicant has undertaken sufficient assessment at this stage of the project of potential impacts of the Proposed Development on physical characteristics of the water environment; the Applicant has had appropriate regard to the WFD and the relevant RBMP; and the Proposed Development would not be likely to have an adverse effect on achieving environmental objectives under the WFD.
- f. In accordance with NPS EN-1 para 5.15.7, the dDCO secures mitigation for adverse effects of construction on the water environment.

- 5.7.95. The ExA considers that the OCoCP and site-specific watercourse crossing plans, secured by rDCO R20 and R25 respectively in the event that the Order is made, would provide adequate mitigation to ensure that if any other adverse effects did arise during construction to water resources, ground conditions and contamination, then they could be properly managed. Therefore, as discussed above, the ExA considers ground conditions and contamination matters should not carry weight against the Order being made.
- 5.7.96. The ExA is satisfied that surface water drainage and local flood risk management and that the ability of the relevant drainage authorities to control works to watercourses is secured under the rDCO Article 15 and Schedule 17 part 7 as well as by specific plans secured under R20(2)(i), R25 and R32. Therefore, as discussed above, the ExA considers that drainage and flood matters should not carry weight against the Order being made.
- 5.7.97. The ExA notes that significant residual adverse effects from open-cut watercourse crossings under Scenario 2 were assessed by the Applicant in the ES as moderate adverse after mitigation in the worst case of multiple permanent culverts within a sub-catchment, alone and cumulatively with the Hornsea Project Three OWF project. Although these effects were agreed with the EA as capable of being mitigated through site-specific plans for watercourse crossings that would avoid permanent culverts where possible, or by provision of additional mitigation and compensation to be agreed with the EA and NE post-consent, the ExA

considers that this should carry little weight against the Order being made.

- 5.7.98. The ExA also notes from the ES assessment in Chapter 20, with which the EA has agreed, that significant adverse residual effects are likely under Scenario 2 from the impact of increased sediment supply on the water environment due to multiple construction activities, both for the project alone and cumulatively with the Hornsea Project Three OWF project, and as explained above, the ExA considers that this should carry little weight against the making of the Order, to be taken into the planning balance in Chapter 7.

5.8. SOCIO-ECONOMIC

Background and policy context

Introduction

- 5.8.1. The ExA identified socio-economic effects as a principal issue [PD-006]. This section considers the following matters:

- a. employment;
- b. tourism;
- c. community infrastructure;
- d. land use, agriculture, including soils (effects on geology, ground conditions and contamination are considered in Section 5.7 and effects on green infrastructure and open space are considered in Section 5.3 of this Recommendation Report); and
- e. health including the effects from electromagnetic fields (EMF).

National Policy Statements

- 5.8.2. For matters relating to the socio-economic effects of the Proposed Development, NPS EN-1 requires the Applicant to assess the creation of jobs and training opportunities and the effects on tourism (NPS EN-1, para 5.12.3).
- 5.8.3. For matters relating to land use and agriculture, NPS EN-1 requires the Applicant to assess the effects on the best and most versatile (BMV) agricultural land and on soil quality (NPS EN-1, para 5.10.5, 5.10.6, 5.10.8).
- 5.8.4. For matters relating to health, NPS EN-1 requires the Applicant to assess the adverse effects on health, identifying measures to avoid, reduce or compensate for these effects as appropriate, and the cumulative effects of more than one development on health (NPS EN-1, Section 4.13).
- 5.8.5. NPS EN-5 addresses the effects of EMFs on human health, referring primarily to overhead lines (NPS EN-5, para 2.10.12).
- 5.8.6. In reaching a decision the SoS should:

- a. have regard to the potential socio-economic effects identified by the applicant and from any other sources; give limited weight to assertions of socio-economic effects that are not supported by evidence; consider provisions and proposals to mitigate effects. (NPS EN-1, para 5.12.6, 5.12.7, 5.12.8);
- b. ensure applicants do not locate on the BMV agricultural land, without justification; but that little weight should be given to the loss of poorer quality agricultural land (NPS EN-1, para 5.10.15);
- c. take account of health concerns when setting requirements relating to a range of impacts such as noise (NPS EN-1, para 4.13.5); and
- d. satisfy themselves that the proposal is in accordance with International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines which give an electric field reference of 5kVm-1 for the general public (NPS EN-5, Section 2.10).

Other legislation and policies

- 5.8.7. The legislation and guidance relevant to this section is set out in the ES Chapter 31 [APP-244, Section 31.2], Chapter 30 [APP-243, Section 30.2], Chapter 21 [APP-234, Section 21.2] and Chapter 27 [APP-240, Section 27.2]. The Applicant's Planning Statement sets out the national, regional and local planning policies that are considered relevant to the Proposed Development [APP-693].

The application

Environmental Statement

- 5.8.8. Socio-economic, land use and health effects that are discussed in this Section have been covered in various chapters in the ES Chapter 31 Socio-Economics [APP-244], Chapter 30 Tourism and Recreation [APP-243], Chapter 21 Land Use and Agriculture [APP-234], and Chapter 27 Human Health [APP-240].
- 5.8.9. Some of the related documents that provide relevant details for development activities and the proposed mitigations include:
- a. Outline Skills and Employment Strategy [REP2-036];
 - b. Schedule of Mitigation [REP6-009] and [REP6-010];
 - c. Figures that accompany the Chapter on Land use and Agriculture [APP-428 to APP-433];
 - d. Figures that accompany the Chapter Tourism and Recreation [APP-533 to APP-536];
 - e. Appendix 27.1 Human Health Supporting Information [APP-665]; and
 - f. Appendix 31.1 Office for National Statistics (ONS) data [APP-657].

Scope

- 5.8.10. The Applicant has assessed the potential effects on jobs and tourism, including the availability of accommodation, and the potential effects on the regional labour market due to job creation. Social effects are assessed with regards to the direct effects on community infrastructure,

on the local population and human health. Direct social effects felt by local communities, caused by increased disturbances from construction or traffic has been assessed over a study area chosen to reflect the onshore project area and the communities around it.

- 5.8.11. Effects of the Proposed Development on human health have been assessed in the ES across the scope of construction, operation and decommissioning, under the themes: noise, air quality, ground/ water contamination, physical activity, journey times and/or reduced access, employment and EMF. The effects of noise, air quality, ground/ water contamination, journey times and access, have been discussed in other parts of this Recommendation Report.

Mitigation proposed

- 5.8.12. Embedded mitigation that is common across the onshore part of the project is set out in Section 5.1.
- 5.8.13. Embedded mitigation for tourism includes the commitment to use underground onshore cable system, tourism and recreation receptors were considered as part of the constraints mapping, during site selection, limited lighting at the onshore project substation and ongoing engagement with stakeholders [APP-243, Table 30.21].
- 5.8.14. Embedded mitigation for land-use and agriculture includes minimising land-take, aligning with field boundaries, avoiding the BMV land, attenuation pond at the onshore substations to accommodate additional impermeable ground, and cable burial depth to minimise impact and interaction with drainage [APP-234, Table 21.15].

Local Impact Reports

Broadland District Council

- 5.8.15. Broadland DC did not raise any specific concerns regarding the matters raised in this part of the ExA's Recommendation Report.

Breckland Council

- 5.8.16. Breckland Council sees opportunities for maximising economic benefits that would arise from the Proposed Development, including apprenticeships and internships, local employment, construction jobs, operation and maintenance requirements over the next 25 years. In this regard Breckland Council considers that the establishment of a Local Liaison Group would be helpful [REP2-062].

North Norfolk District Council

- 5.8.17. North Norfolk District Council (NNDC) states that the impact on tourism is being played down by the Applicant and challenges some of the ES statements. It sets out evidence in its LIR Appendices to demonstrate North Norfolk's high dependency on tourism. NNDC points out that the onshore cable route goes through Happisburgh and North Walsham which are attractive to tourists throughout the year and host to visitor

accommodation, walking and cycling. In this regard, while NNDC believes the long-term impacts of the cable route on the tourism economy would be benign, it has significant concerns regarding the direct impacts and negative perceptions during construction. Referring to a 2017 report, NNDC stated that the District's economy depends heavily on tourism, which accounts for 29% of total employment. As such, the effects of the construction activities would have a disproportionately high effect on the overall economy.

- 5.8.18. NNDC's proposed mitigation scheme includes compensation awarded to local tourism and associated businesses affected by the Proposed Development, and marketing activity to combat negative perception and to assist with generating tourist footfall and spend. To enable this, NNDC proposes an additional DCO requirement to cover the detail of a proposed tourism and associated business impact mitigation strategy [REP2-087, para 14.21].

Norfolk County Council

- 5.8.19. Norfolk County Council (NCC) acknowledged the potential for economic benefits that would arise from the Proposed Development in terms of local employment creation, for the business sectors affected by construction, and operation and maintenance of the wind turbine generators. NCC stated that its Economic Development team has had regular, constructive dialogue with the Applicant, and welcomes the inclusion of R33 in the dDCO for a Skills and Employment Strategy (SES) under Scenario 2, ensuring that there is a skills legacy to the Proposed Development.
- 5.8.20. Notwithstanding this, NCC stated that it values the engagement with the Applicant, and would like to continue to see progress:
- a. engaging with local supply chain companies to ensure that local businesses can benefit as far as possible from a wide range of contracts as they emerge;
 - b. to attract new investment into the area, in particular new manufacturing capacity;
 - c. the use of Great Yarmouth Port during the construction phase and later in respect of operations and maintenance; and
 - d. to develop the creation of apprenticeships; work experience and internships.
- 5.8.21. NCC stated that it welcomes the use of HVDC technology as it would reduce the potential effects and disruption to business as a consequence. However, it felt that the Applicant should commit to providing appropriate compensation for businesses and communities adversely affected by the construction works.

Issues: Socio-economic

Employment and skills

- 5.8.22. NCC confirmed [REP2-084, Q.13.0.2] that it was content with the high-level principles of the Outline Skills and Employment Strategy (OSES)

[REP16-012]. NCC also confirmed that it had engaged with the Applicant throughout the process of preparing the OSES and the Supply Chain Plan, which would ensure that mechanisms were in place to maximise the potential opportunities for local businesses as a result of the Proposed Development [REP2-084, Q.13.0.2, Q.13.0.3].

- 5.8.23. The Applicant's assessed economic effects [APP-244] with regards to direct and indirect job creation, compared against the size of the labour market in the New Anglia LEP region are set out in a number of locations. Figures 24.9 [APP-460], 24.10 [APP-461] and 24.11 [APP-462] for employee distribution indicates that workers would be travelling from both Norfolk and Suffolk to work on the Proposed Development. The Applicant anticipates an increase in direct employment of 2.83% for Scenario 1 and 3.21% for Scenario 2.
- 5.8.24. For indirect employment the Applicant anticipates an increase of 0.72% for Scenario 1 and 0.59% for Scenario 2 [APP-244, Table 31.35, 31.36]. In both Scenarios 1 and 2, the Applicant states that there would be a major beneficial impact on direct employment and a new, minor beneficial impact due to indirect and induced employment in the New Anglia Local Enterprise Partnership (LEP) region. The Applicant explained that under Scenario 1 the SES would be developed by Norfolk Vanguard on behalf of both Norfolk Vanguard and Norfolk Boreas OWF [REP2-036, para 10]. This was secured by R33 of the Norfolk Vanguard OWF made DCO [REP13-029]. In Scenario 2 of the Proposed Development, the OSES would be secured by R33 of the dDCO and would require the approval of NCC, prior to commencement of any stage of the transmission works, following consultation with NNDC, Broadland DC, Breckland Council, and the New Anglia LEP.
- 5.8.25. Although the ExA was initially concerned about the level of detail in the OSES and whether the supply chain strategy had been consulted upon, it was reassured by NCC's representations on these matters.

ExA's reasoning

- 5.8.26. The ExA notes that the Norfolk Vanguard OSES [REP2-036] would be submitted for approval for both projects should Norfolk Vanguard OWF start delivery before the Proposed Development. In that regard, the ExA is content that the OSES submitted for the Proposed Development [APP-713] is consistent with the Norfolk Vanguard OSES. However, if the Proposed Development would start delivery before Norfolk Vanguard OWF, the ExA notes that there is not a mechanism to secure the SES. Therefore, the ExA has made an addition to R33, in the rDCO to refer to this potential eventuality under Scenario 1.
- 5.8.27. The ExA is satisfied that the Applicant's commitment to prepare a SES would be secured for both scenarios with the ExA's proposed addition to R33 in the rDCO. In that regard, the ExA believes that the Proposed Development would deliver the policy requirements of NPS EN-1 Section 5.12.

- 5.8.28. NPS EN-1 Sections 2.2 and 3.4 emphasise the need for transition to a "*secure, low-carbon energy system*", requiring major electrification of heating, industry and transport as well as prioritisation of sustainable power generation; it recognises the need for government facilitation of private sector investment in urgently delivering new infrastructure projects for renewable energy generation and transmission, in order to meet the UK's commitment to cutting greenhouse gas emissions to reduce the severity of climate change and to improve the "*security, availability and affordability*" of electrical energy generation as well as efficiency of distribution.
- 5.8.29. Therefore, the ExA recognises the compelling case for delivery of new electricity generation infrastructure from renewable sources, of which offshore wind is a major element. In that regard, the ExA considers that the Proposed Development would deliver social and economic benefits both directly and indirectly, through employment and skills development and through cost-efficiencies and competitive availability for industrial, commercial and domestic consumers and transport operations.

Tourism and recreation

- 5.8.30. The Applicant concluded that following mitigation the residual effects of the Proposed Development on tourism and recreation range from no effect to minor adverse effect during the construction and operation phases of the proposed project under both Scenario 1 and Scenario 2 [APP-243, Table 30.35]. The Applicant stressed that where adverse construction effects have been assessed, these would be mitigated with the development of a CoCP and TMP, secured through R20 and R21 in the dDCO [REP18-011].
- 5.8.31. While NNDC accepts that the long-term effects of the cable route on the tourism economy would be benign, it argued that during the cable corridor construction phase there would be a detrimental effect on tourism and that these effects had been downplayed by the Applicant [REP2-087] and [REP4-031]. Some RRs, notably Happisburgh PC, also made the case that the Proposed Development would negatively affect businesses and tourism in general in North Walsham and Happisburgh area in particular as a result of construction traffic and working hours [RR-048], [REP1-047] and [EV13-013]. Other IPs raised concerns in relation to the short-term disruption to the use of footpaths around the Happisburgh beach and cliff areas and potential effects on holiday lets [RR-004].
- 5.8.32. In response to WQ3 and the OFH3 [REP13-014], the Applicant reiterated the embedded mitigation measures that would minimise effects of construction on local tourism and businesses [APP-243, Table 30.21], adding that the Applicant has made a commitment to long HDD at the landfall to avoid restrictions or closures to Happisburgh beach, retain open access to the beach during construction, and to not use the beach car park at Happisburgh South [REP8-015, Q3.13.2.1]. The Applicant added that the adverse effects would be due to construction and were temporary and reversible once construction was complete. The Applicant also argued that the residual potential effects on local tourism during the

construction phase as assessed in the ES [APP-243] [APP-244] following mitigation were not assessed as significant.

- 5.8.33. NNDC disagreed with the Applicant's assessment methodology and the mitigation approach [REP10-040, Pages 55 to 60]. It proposed an additional requirement be added to the dDCO to secure a mitigation scheme including compensation and marketing activity for affected businesses [REP2-087, para 14.21]. NNDC stated that it would be fair and reasonable to have a form of mitigation package in place for businesses affected adversely as a result of negative perceptions arising from the works along the cable corridor [REP10-040, Page 58].
- 5.8.34. The Applicant disagreed [REP7-017]. It referred to the need for the requirements in the DCO to be: necessary; relevant to planning; relevant to the development to be consented; enforceable; precise; and reasonable in all other respects. The Applicant considered that the proposed requirement would not meet these tests because the compensation was not necessary to mitigate adverse effects identified in the ES. The Applicant also believed that it would not be possible for claimants to prove that compensation was required as a direct result of the Proposed Development [REP7-017, Q3.13.2.1].
- 5.8.35. The ExA asked NNDC whether it had further evidence to support its case. NNDC referred back to the evidence submitted with the LIR [REP2-087] and a report from Royal Society for the Encouragement of Arts, Manufactures and Commerce that assessed the economic impact of COVID-19 in different Local Authority Areas [REP9-059]. NNDC acknowledged that this evidence was not directly relevant to the construction of the onshore elements of the Proposed Development but made the case that local businesses need more than Government support to ride out the current situation. This remained a matter of disagreement with the Applicant as identified in the final SoCG [REP10-040].
- 5.8.36. The ExA did not find evidence from NNDC that there would be an actual or perceived adverse effect from the Proposed Development on tourism in the area. The reports accompanying the LIR and the Royal Society for the Encouragement of Arts, Manufactures and Commerce report on the effects of COVID-19, provided generic information; none of which present any crucial evidence to counter the Applicant's assessment in the ES and make a case to support NNDC's claim. Moreover, the ExA notes that NNDC accepts that the long-term effects of the cable route on the tourism economy would be benign [REP2-087].
- 5.8.37. The ExA does not find that NNDC's proposed requirement for a tourism mitigation strategy would be justifiable, because of the lack of evidence. The ExA agrees with the Applicant's argument that the draft requirement proposed by NNDC would not meet the test set out in NPS EN-1 (paras 4.1.7 and 4.1.8). In conclusion, the ExA finds the Applicant's assessment as presented in the ES convincing, that the construction effects would be temporary, and after embedded mitigation the residual effects on tourism

would not be significant. The ExA also concludes that the Proposed Development would meet the requirements of Section 5.12 in NPS EN-1.

Commercial inshore fishing

- 5.8.38. The matter of mitigation or compensation for any potential disruption to fisheries and fishing is discussed in section 5.11 of this Recommendation Report.

Community compensation fund

- 5.8.39. Under both scenarios, the Applicant argues that while there would be adverse effects on community infrastructure these effects would be of minor adverse or negligible significance [APP-244].
- 5.8.40. Necton PC and NCC suggested compensation for community and businesses affected by the Proposed Development [REP2-021, Q5.8.1]. The Applicant explained that any community compensation associated with permanent above ground onshore infrastructure would be undertaken independently of and without prejudice to the DCO process [AS-024, Table 28] [REP2-085] [REP13-031]. The Applicant added that should the Proposed Development be consented, it would develop a voluntary community benefit fund which would aim to acknowledge the role of communities hosting the project [REP13-014, Point 9]. NCC reported that it was satisfied with the Applicant's suggestion of developing a wider community benefit fund outside of the DCO process [REP5-065, Q2.13.2.2].
- 5.8.41. The ExA agrees with the Applicant's argument that addressing community benefits, as opposed to mitigating adverse effects, is a matter which should be considered separately to the application for the development consent. The ExA notes the Applicant's intention to develop a community benefit fund should the Proposed Development be consented; however, given that the community fund is not secured in the rDCO, the ExA has not given this any weight in its considerations.

Cumulative effects for socio-economic effects

- 5.8.42. The direct cumulative effects of the Proposed Development, for both Scenario 1 and 2, have been assessed with those arising from Norfolk Vanguard OWF (Scenario 1 only) and Hornsea Project Three OWF. However, for cumulative effects on construction employment, the Applicant has included other major offshore wind projects in the assessment, including East Anglia ONE, East Anglia THREE, East Anglia ONE North and East Anglia TWO. Consequently, cumulative construction employment in the offshore wind sector is assessed to create a major beneficial impact due to a continuous pipeline of projects over the next 10 years [APP-245]. Similarly, all OWFs that have the potential to operate in the New Anglia LEP have been considered for operational employment assessment, and the Applicant predicts a long term major beneficial effect.
- 5.8.43. The ExA is of the view that including programmes and projects that have no certainty in the socio-economic part of the Cumulative Impact

assessment (CIA), would not be consistent with the assessment of the worst case scenario in other technical areas. For that reason, the ExA considers the cumulative beneficial effects in employment are overstated because not all the projects included in the CIA can be assumed to be consented and therefore necessarily add benefit. However, the ExA still agrees with the Applicant that the effect of the Proposed Development (alone or cumulatively) would be net positive for direct and indirect employment. In this regard, the ExA also considers that the SES, if suitably delivered, would maximise this benefit for the economy in the New Anglia LEP region.

Issues: Land Use

- 5.8.44. Matters relating to the effects of the onshore cable installation on agricultural land have been discussed in Section 5.4 of this Recommendation Report. Land use matters relating to agriculture are reported here. The Relevant Representations raised a number of issues including effects on farming activities, cumulative effects at the cable crossing point, link boxes, soil, private water supplies and dDCO articles relating to accessing land to survey or investigate and notice period for taking temporary possession of land. The Applicant set out its response to these matters [AS-024, Table 16]. Specific issues arising during the course of the Examination are discussed in turn.

General effects on agriculture and farming activities

- 5.8.45. The Applicant considered the potential effects of the Proposed Development on drainage, agricultural land, soil quality, Environmental Stewardship Schemes and utilities [APP-234].
- 5.8.46. Several land agents worked in collaboration with the National Farmers Union (NFU) during the Examination. The land agents referred to themselves as the Land Interest Group [LIG]. The NFU and LIG submitted an identically worded joint relevant representation on behalf of a number of their clients. The NFU and LIG raised concerns about the potential for disruption to farming activities arising from the timing of construction and its relationship with timing of construction of Norfolk Vanguard OWF.
- 5.8.47. The Applicant's proposed mitigation is in the OCoCP, secured through R20 of the dDCO, and through an agreement with NFU/LIG and the Applicant to appoint an Agricultural Liaison Officer (ALO) as the sole point of contact during construction and operation [REP18-031, Page 5 to 7]. Related matters are discussed in Section 5.2 of this Recommendation Report regarding harvest vehicles, in Section 5.4 in relation to cable corridor width and cable installation strategy and in Section 5.7 regarding temporary change to land drainage.

Authority to survey and investigate land (Article 16)

- 5.8.48. The Applicant and the NFU/LIG were unable to agree on matters relating to how accessing land to survey or investigate would be secured in the dDCO.

- 5.8.49. The NFU requested a new paragraph to be inserted in Article 16 of the dDCO which would require any notice given to indicate the nature of the survey or investigation. The Applicant considers that the extra dDCO wording proposed by the NFU is onerous and would place additional inefficiency on those undertaking surveys as they might have to withdraw from land and serve additional notices e.g. if an extra investigation was required. The Applicant refers to the role of the ALO, as set out in the OCoCP, who would be appointed prior to any pre-construction activities and would provide day-to-day contact with affected parties to minimise disruption to farming activities [REP8-015, Q3.5.1.2].
- 5.8.50. The NFU wanted inclusion of wording which would highlight the type of equipment to be used during surveys and an estimate of the length of time surveys would take [REP3-018, Q5.1.7], [REP5-074, Q2.5.1.6], [REP10-062, Q4.5.1.1]. The Applicant also resists these suggestions for the same reasons. At D10, the NFU included suggested additional wording for the role of the ALO [REP10-062, para 2.15]. The Applicant repeated its position resisting any wording that would limit surveys only to use of equipment previously specified [REP11-007, Q4.5.1.1]. This matter was also raised by the NFU/LIG at OFH3 (Necton Session) [EV13-011].
- 5.8.51. The Applicant later inserted words into the ALO description in the OCoCP which reflects the NFU's request but adds "*where possible*" [REP14-013, Appendix B] and [REP15-003, Q5.5.1.2]. In the final SoCG, submitted at D18 [REP18-031] there is agreement over the wording for the ALO role, but the NFU makes it clear that it requires changes to Article 16 as well. [REP18-031, Page 34 to 36].
- 5.8.52. The NFU would like boreholes to be specifically mentioned in Article 16, as it considers a trial hole is not the same as a borehole. The Applicant is of the opinion that boreholes are covered by the power to make trial holes in Article 16(1)(b). The NFU confirms its request for boreholes to be added to Article 16 in the final SoCG [REP18-031].

ExA's reasoning

- 5.8.53. The ExA welcomes the inclusion of the wording on the ALO role and the agreement reached between parties. The ExA has considered the request for the addition to Article 16, which is asking for the following addition, with subsequent renumbering:

"16 (3) The notice required under paragraph (2) must indicate the nature of the survey or investigation that the undertaker intends to carry out."

- 5.8.54. The ExA considers this is a reasonable request because types of survey could differ greatly and that could affect the way in which the land in question could continue to be used for other purposes and what preparations the landowner would need to make prior to the survey being undertaken. The ExA has therefore made this addition to the rDCO and amended subsequent clause numbering.

- 5.8.55. The ExA agrees with the Applicant that the NFU's request to have boreholes specifically mentioned in Article 16 is unnecessary because a trial hole would cover a borehole. No change in this regard has therefore been made to the rDCO.
- 5.8.56. In making this change to the rDCO, the ExA can confirm that if the SoS disagrees with this addition to Article 16, there would be no concomitant changes necessary if the SoS were to adopt the Applicant's final dDCO drafting.

Temporary use of land onshore (Article 26)

- 5.8.57. Regarding Article 26(2), the NFU and the Applicant were unable to agree whether the notice period before entering and taking temporary possession of land should be 14 days (as included in the dDCO and argued by the Applicant) or 28 days (a suggested amendment for all DCOs going forward by the NFU/LIG). Both parties gave examples of where 14 or 28 days have been used in other DCOs [REP8-015, Q3.5.1.3].
- 5.8.58. The Applicant also made the point that 14 days would be consistent with what was proposed for the Norfolk Vanguard OWF DCO (subsequently made), a point repeated later in the Examination [REP13-015, Point 17]. The NFU's case centred on the difficulties its farmer members are facing with other schemes where there is only 14 days' notice. These include the need to give third parties notice, changing supplies, moving livestock etc. The NFU refers to Highways England schemes, where 28 days' notice has been agreed and to High Speed 2 (HS2), which has agreed three months [REP3-018], [REP5-074].
- 5.8.59. The Applicant stated that in contrast to the DCO examples cited by the NFU, the Proposed Development's DCO would have no residential properties within the land identified as subject to compulsory acquisition powers [REP8-015, Q3.5.1.3]. The NFU argued at OFH3 that because entering agricultural land affects farmers' businesses, it is therefore more important for the notice period to be longer than it would be for entering land associated with residential properties [EV13-011].
- 5.8.60. The ExA finds the NFU/LIG's case compelling firstly on the grounds of the potential practical activities that landowners could need to undertake prior to the undertaker accessing the land, for which the ExA agrees 14 days could be short. Secondly because the land is set down to business use, the ExA considers it is reasonable for the notice period to reflect potential business needs in order to make practical arrangements prior to entry.
- 5.8.61. The ExA is aware this differs from that in the made Norfolk Vanguard OWF DCO. However the ExA has also made this recommendation because it considers the temporary use would be more extensive and pertinent for Scenario 2, where there would be no need for consistency with another DCO, the temporary use related to the different DCOs in Scenario 1 would be unlikely to overlap in timescales and because the

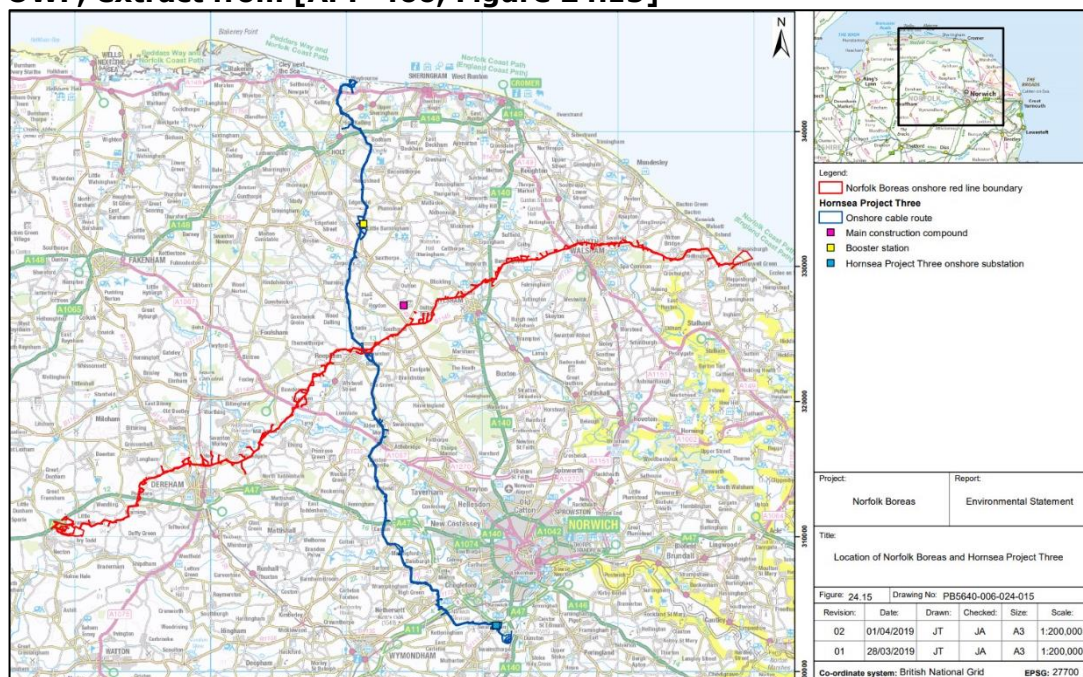
ExA considers that the business disruption argument made by the NFU/LIG over-rides that relating to potential confusion.

- 5.8.62. The ExA has therefore changed the number of days for serving notice for temporary possession from 14 to 28 in Article 26(2) of the rDCO. In making this change in the rDCO, the ExA can confirm that if the SoS disagrees with this alteration to Article 26, there would be no concomitant changes necessary if the SoS were to go back to the Applicant's final dDCO drafting.

Cumulative effect of the installation of cables at the crossing point at Reepham, when considered alongside Norfolk Vanguard OWF and Hornsea Project Three OWF

- 5.8.63. The Proposed Development's cable corridor would cross or be crossed by the Hornsea Project Three OWF cable corridor at a location north of Reepham (Figure 5.8.1 and Figure 5.8.2). This is a location where matters have been raised by IPs relating to several different topics.

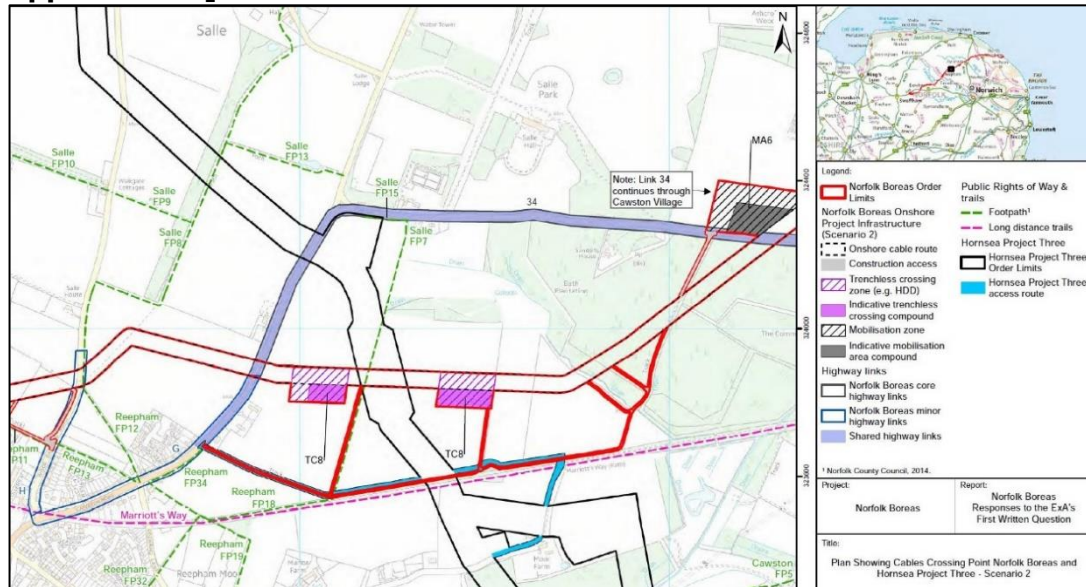
Figure 5.8.1: Location of Norfolk Boreas and Hornsea Project Three OWF; extract from [APP-466, Figure 24.15]



- 5.8.64. The NFU/LIG were concerned about the cumulative effects of the installation and presence of the cables in relation to farming activities at the crossing point. In particular, they raised the potential disruption to farming practices arising during construction due to the extent of land-take and their view that the most thermally efficient option for the crossing cables must be adopted.
- 5.8.65. Concerns were also raised at OFH1 regarding the potential impact of EMFs where the cables cross and how the cables might interact with each other at the crossing point, electrically, thermally and physically [EV4-001], [REP1-068]. At OFH2 [EV12-002] N2RS had concerns regarding the geographical extent of the crossing, which would depend on the

decision by Hornsea Project Three OWF on the use of HVAC or HVDC technology, if it were consented. The matter was raised again at OFH3 [EV13-011]. The land required can be seen on Figure 5.8.2.

Figure 5.8.2: Scenario 2 proposed crossing point of the Proposed Development with Hornsea Project Three OWF, extract from [REP2-023, Appendix 4.3]



- 5.8.66. Regarding the land-take and adverse effects resulting from heat emitted from the cables at the crossing point, the NFU/LIG have agreed the general principle that the most thermally efficient crossing design and the least disruptive construction method would be implemented. This agreement is recorded in the SoCG [REP18-031], which sets out the overarching construction arrangement. The Applicant emphasised that the least disruptive construction method would also be key to undertakers involved in construction. The Applicant also explained that enhanced thermal conductivity backfill would be used in the instance where the first project to install cables used the open trench method.
- 5.8.67. The Applicant referred to its Co-operation Agreement with Ørsted, which it did not share on grounds of confidentiality, but which it stated includes matters pertinent to construction management. The final SoCG with Ørsted included a section on its draft Design Interaction and Co-operation Agreement, setting out a list of matters which would be covered in the Agreement including that the cable installation works would be designed so as to ensure that the other parties could install cables – *“for example, if the first project installs the cables by way of open cut trench, that section of trenching will include enhanced thermal conductivity backfill to reduce any potential future thermal interactions with the second project”* [REP18-032, page 14].
- 5.8.68. The SoCG with the NFU/LIG also states that the specific crossing arrangement and associated method statement would be determined following detailed design and decisions regarding number of cables, circuits and power flow. The NFU/LIG continued to be concerned that there was not confirmation from Ørsted to the general principle of using

the most thermally efficient crossing design [REP18-031]. However, at D18, the Applicant submitted a revised OCoCP with additional wording specifically covering the principles for crossing Hornsea Project Three OWF's cable corridor, "*which would as far as reasonably possible be least disruptive to agriculture and be thermally efficient*" [REP18-019, Appendix F]. This is also set out as the final position in the SoCG, where the LIG/ NFU and the Applicant are agreed and aligned on the position, however Ørsted would need to agree the position with the NFU/LIG. [REP18-031, page 21].

- 5.8.69. Matters relating to using reasonable endeavours to co-operate and provide assistance to each other are included in the Protective Provisions in the rDCO which have been agreed between the Applicant and Ørsted [REP18-009, Schedule 17]. This also covers the need for parties to liaise over up-to-date information regarding the position of any apparatus at the crossing point. The Applicant submitted that these principles of co-operation are reciprocated in the Protective Provisions contained in the (then) draft Ørsted Hornsea Project Three OWF DCO for the Applicant and for Norfolk Vanguard OWF (which would install the cables for the Proposed Development in the case of Scenario 1) [REP14-036, Q5.4.0.11].

ExA's reasoning

- 5.8.70. The ExA is satisfied that the matters raised by the NFU/LIG regarding the need to ensure the most thermally efficient arrangement at the crossing point have been secured as far as is reasonably possible in the final OCoCP. Parties accepted that there would need to be a further iteration of the working methods in the CoCP. The ExA is content that this is the case because the final arrangement for the cable crossing could not be confirmed until a decision is made on HVAC or HVDC transmission for Hornsea Project Three OWF.
- 5.8.71. Likewise, the extent of land-take required would vary according to the cable arrangement for Hornsea Project Three OWF. The ExA is satisfied that the addition to the OCoCP, the Protective Provisions in the rDCO and the outline content for the Co-operation Agreement between the Applicant and Ørsted all lead to a position that would achieve the aims of minimising disruption to agriculture. The ExA also considers that the role of the ALO as set out in the OCoCP would provide a mechanism for ensuring that the land-take was kept to a minimum.
- 5.8.72. In the case of Scenario 1, the thermal efficiency matters would have been addressed through the Norfolk Vanguard OWF installation of the cables, as would the main issues regarding land-take.

Link boxes

- 5.8.73. The NFU/LIG raised concerns about the location and number of link boxes which would be needed along the cable corridor because they would stand proud above ground level and could interfere with agricultural operations and could be a hazard to farm machinery. The NFU/LIG wanted further design and siting information on link boxes,

stating a preference that all link boxes would be located in field boundaries [REP2-046, Page 9].

- 5.8.74. During the Examination the Applicant inserted refined wording about consultation on link box location requests and a general specification to locate them within two metres from field boundaries in the Design and Access Statement (DAS). The Applicant explained that the wording inserted reflects that in the final form of the Deed of Easement.
- 5.8.75. The link box wording is included in the final DAS [REP14-014, Section 5.2]. The DAS is a certified dDCO document set out in Schedule 18 of the dDCO. Matters are also stated as being agreed in the final SoCG between the parties [REP18-031, Page 24 to 25]. The ExA is satisfied with the inclusion of Link Boxes in the DAS which is a certified document in the rDCO.

Soil

- 5.8.76. The NFU/LIG were concerned that measures were not in place in relation to soil treatment, reinstatement and aftercare. The Applicant stated [APP-234] that provided mitigation measures were in place, under both scenarios the Proposed Development is predicted to have negligible to minor adverse effects. Mitigation measures include the use of an ALO, ensuring agricultural field drains are maintained, avoiding the BMV land, and employing best practice measures through a Soils Management Plan secured through R20 of the dDCO and the Schedule of Mitigation [REP18-017, Table 14].
- 5.8.77. The ExA asked how the Applicant's commitment to burying the onshore cable to 1.05m in normal agricultural land and 1.2m in areas of 'deep ploughing' to top of duct was secured in the dDCO. The Applicant clarified [REP2-021, Q13.3.4] that the minimum depth of onshore cable burial has been included in the private land agreements and would be included in Construction Method Statements as required by the OCoCP [REP18-019], which is secured in R20(g) of the dDCO.

Access concerns

- 5.8.78. In its joint RR, NFU/LIG reported that some landowners had raised issues regarding field shapes and access routes. These matters are discussed further in Chapter 8 of the Recommendation Report. By the end of the Examination, the NFU/LIG was content that outstanding access issues had been agreed and that there was a mechanism in place to agree other concerns should they arise [REP18-031, Page 33 to 34]. The matter affecting the landowner under Scenario 1 proposed land-take for the onshore project substation has been discussed in Section 5.3 of this Recommendation Report.
- 5.8.79. The ExA also asked for more information about the roles and responsibilities of the ALO, in particular to understand if this role was distinct from the Community Liaison Officer [REP10-013, Section 2.4] and the Traffic Management Plan Coordinator [REP10-017, Section 5.3]. The Applicant responded to clarify that while each of the three roles

would collaborate and exchange relevant information as appropriate, they would be distinct and aim to meet the interests and needs of different stakeholders [REP14-036, Q5.4.0.7].

- 5.8.80. The NFU/LIG was content with the arrangement for the ALO to be the sole point of contact during construction, but had concerns about the Scenario 1 operational stage, which could result in four easements. In this regard, the NFU/LIG requested that there would be one joint operational manager as a single point of contact. At the close of the Examination, agreement had been reached on the concept of a single point of contact, with the detail still to be negotiated [REP18-031, Page 5 to 7].
- 5.8.81. The ExA agrees with the Applicant's assessment that after the proposed mitigation no significant effects are likely to arise on land-take. The ExA notes that the issues raised regarding access routes are either resolved, or there is mechanism in place to agree other concerns should they arise. The ExA is content that the proposed mitigation is adequately secured in the Soils Management Plan and OCoCP through R20 in the dDCO. The ExA welcomes the clarification in the role of the ALO as the single point of contact for mitigation for effects on agriculture and landowners. The effectiveness of the ALO in responding to the concerns of landowners would depend on the details of the role as it is developed post consent. In this regard The ExA highlights the significance of engaging with relevant planning authorities and NFU/LIG to define the responsibilities of the ALO. The ExA is content that the role of ALO as mitigation is adequately secured in the OCoCP through R20 in the dDCO.

Effects on private water supplies

- 5.8.82. The provision of alternative private agricultural water supplies and irrigation in the event of existing supplies being contaminated through construction activity was a matter of significant contention throughout the Examination. The NFU and the LIG argued from the outset that the Applicant should install and supply alternative water supplies during construction should supplies be affected by the Proposed Development [RR-044].
- 5.8.83. The Applicant did not disagree with the principle of providing an alternative water supply but pushed for flexibility to agree a commercial solution should the situation arise [REP7-017]. It amended the OCoCP to state that it would provide an alternative water supply should a borehole become disturbed or unusable [REP10-013]. The Applicant added at D15 that it would "*...meet the reasonable cost of installing an alternative if viable to do so. If it is not possible to procure an alternative, and it is not viable to meet the cost of an alternative, then the landowner/ agricultural tenant would be compensated for the loss in accordance with the Compensation Code*". The Applicant stated that whilst it would take responsibility for installing the water supply it would not take responsibility for supplying the water [REP15-003].
- 5.8.84. The NFU/LIG were not satisfied with this approach, arguing on several occasions (including at OFH3) that the Applicant should be responsible

for the supply of water as well as the installation of the supply. They explained that in some instances it might be a simple repair where, for example, a pipe was severed and would just need a section replacing, in which case the supply of water would not be affected. However, if for example a borehole or spring became contaminated, an alternative such as a new borehole would be needed, or potentially a borehole might not be able to be provided and therefore, a mains connection might be needed. In the latter case, in the NFU's view, the Applicant should meet the costs of supplying that water as well as installing the means of supply.

- 5.8.85. The NFU provided alternative drafting for the OCoCP, a detailed explanation of which is set out in the SoCG [REP13-037; REP18-031]. The NFU referred to the proposed Order for A303 Stonehenge in which the OCoCP for that scheme included specific drafting to cover the supply and alternative means of providing that supply. The NFU also disagreed with the phrasing 'reasonable endeavours' which in its view did not provide a "*strong enough commitment given the importance of a provision of a water supply*" [REP13-037].
- 5.8.86. The Applicant rejected the NFU's alternative OCoCP drafting, confirming that it wished to retain the drafting set out in its D10 response [REP10-013]. The final SoCG between the parties explained why the Applicant adopted this position [REP18-031]. The ExA pursued the matter at various points in an attempt to seek a resolution of the matter [PD-014; PD-016; PD-022]. At the close of the Examination, as indicated in the SoCG, no agreement was reached [REP18-031].
- 5.8.87. The ExA considers the NFU makes a powerful case in setting out the distinction between the installation of and the sourcing of an alternative water supply. Notwithstanding this, the ExA notes the Applicant has made a commitment to meet the reasonable cost of installing an alternative supply, albeit with the caveat "*if viable to do so*". The ExA anticipates the ALO referred to earlier in this section and secured via the OCoCP, would play an important part in encouraging diligent efforts to be made to secure an alternative water supply. In this way, the ExA anticipates the importance of locating the provision of a water supply would be ensured.
- 5.8.88. That said, it also seems reasonable to the ExA to anticipate that, in spite of reasonable efforts from all parties, there could be occasions when an alternative water supply might not be deliverable in which case, the ExA does agree that the landowner/ occupier could seek recompense for loss in accordance with the Compensation Code. As such, the ExA is content with the drafting proposed by the Applicant in the OCoCP and is including this in the rDCO.

Issues: Health

EMF

- 5.8.89. Some IPs raised concerns regarding the health risks relating to EMF exposure and the effect of magnetic fields at the crossing point of the

Proposed Development with Norfolk Vanguard OWF and Hornsea Project Three OWF [REP1-068], [EV4-001].

- 5.8.90. The Applicant explained that onshore infrastructure was largely routed through agricultural land and away from population centres and sensitive receptors, thus the potential number of receptors had been reduced through site selection and project design embedded mitigation [APP-240, Section 27.8].
- 5.8.91. The Applicant states that the buried cable systems would produce EMFs, but EMF exposure limits for both HVAC and HVDC were subject to UK regulations [APP-240, para 122]. The EMF guidelines are documented in NPS EN-5 and [APP-240, para 141], Public Health England (PHE) has also produced guidelines identifying EMF thresholds above which there is the potential for human health effects. The level of EMFs produced by the Proposed Development buried cable systems would be approximately 1% of the value PHE has identified as a safe level. As such, the Applicant concludes that there would be no effect to population health due to EMFs during operation under either scenario [APP-240, paras 295, 296]. District Councils also confirmed in their final SoCGs that the methodology used by the Applicant in respect of human health effects was appropriate and robust.
- 5.8.92. The Applicant argued that the decision to use HVDC technology to transmit power eliminated many potential adverse effects associated with EMF emissions. It also stated that available evidence from studies reviewed by PHE; the World Health Organisation and the International Agency for Research on Cancer had not identified any health risk for humans or animals exposed to HVDC magnetic fields [REP1-036].
- 5.8.93. The Applicant submitted the analysis of potential EMF effects undertaken by National Grid for the developers of the Norfolk Vanguard OWF and Hornsea Project Three OWF [AS-025, Appendix 1, EMF Information Sheet]. In the case of either scenario, the Proposed Development would use HVDC, but the decision over which technology for Hornsea Project Three OWF remained as an alternative. The Information Sheet considers all possible crossover options in terms of exposure limit compliance. This shows that in respect of cable crossing scenarios at Reepham, irrespective of whether HVDC or HVAC cable connections were used by Hornsea Project Three OWF, they would be compliant with the UK exposure limits set for electric and magnetic field exposure, with respect to public health. This is because in the case of HVAC and HVDC, the magnetic fields do not interact with each other and so worst case magnetic field calculations would be based on the cables separately. In the case of both projects using HVDC, the maximum calculated magnetic fields at various distances from the outer cable are included and demonstrate that all HVDC magnetic fields are below the UK exposure limits. The Information Sheet referred to above sets out that worst case parameters for crossings, such as depth, angle of crossing, which cable is on top, have been included in the calculations [AS-025, Appendix 1, EMF Information Sheet].

- 5.8.94. PHE [REP7-063] and National Grid [REP3-019] confirmed that they were satisfied with the Applicant's assumptions and assessment set out in the ES [APP-240]. PHE also confirmed the Applicant's position that there were no identified health risks for humans exposed to HVDC magnetic fields, provided exposures to HVDC magnetic fields comply with the relevant international (ICNIRP) guidelines.

ExA's reasoning

- 5.8.95. Based on the evidence provided by the Applicant, the ExA is satisfied that the Applicant has assessed the worst case for EMFs. The ExA is content that the Information Sheet submitted, which was prepared for the Norfolk Vanguard OWF, is relevant for the Proposed Development because it calculates magnetic fields for either of the crossing options which could occur in the case of Hornsea Project Three OWF and the Proposed Development. The ExA also notes the confirmation provided by National Grid in relation to the Reepham Crossover where National Grid concluded that the Proposed Development and cumulatively with Hornsea Project Three OWF would remain within the ICNIRP exposure guidelines. The ExA is satisfied that adverse effects arising from EMFs would be below UK exposure limits and conforms with NPS EN-5.

Physical and mental health

- 5.8.96. Corpusty and Saxthorpe Parish Council (PC) questioned if PHE's wider public health concerns regarding the effects of the Proposed Development have been properly considered by the Applicant [REP2-068]. Here, the Parish Council highlighted that while PHE did not identify any significant risk to public health, it acknowledged that some localised issues would need careful management during the development phase in consultation with the district and county councils. Corpusty and Saxthorpe PC also queried whether the effects on communities living along the B1149 and B1145 and effects on well-being had been considered [REP12-002]. Further representation was made at ISH3 regarding the wider effects on physical and mental health of communities subject to effects of construction activities of the Proposed Development and cumulatively over a longer period with other OWFs [EV6-001 to EV6-006]. At OFH3 the ExA heard from a number of IPs about the cumulative, sequential, combined (when receptors would be subjected to multiple impacts) adverse effects of construction activities on communities [EV13-001-EV13-013].
- 5.8.97. The ExA sought clarity from the Applicant, as to whether the overall effects on individual communities in specific locations had been assessed. The Applicant explained that the adverse effects of construction activities on communities has been assessed in different parts of the ES including in relation to Air Quality Traffic and Transport, Noise and Vibration, Water Resources and Flood Risk, Tourism and Recreation and Socio-economics, and mitigated as appropriate. The Applicant emphasised that its approach to the assessment followed the guidance and approaches recommended by PHE [REP14-036, Q5.4.0.5].

- 5.8.98. The Applicant also stated that the local authorities had agreed in the SoCGs that the assessment approach was both compliant and appropriate for the scale of the Proposed Development and the impacts anticipated [REP9-013] [REP10-036] [REP10-040] [REP9-015]. The Applicant reiterated that assessment of the effects on health had followed appropriate guidelines and those effects were found to not be significant in EIA terms [REP14-036, Q5.13.4.1].
- 5.8.99. In spite of the Applicant confirming that the assessment of effects had followed appropriate guidelines and found them to be not significant in EIA terms, Corpusty and Saxthorpe PC maintained its concerns at the end of the Examination.

ExA's reasoning

- 5.8.100. The ExA notes and gives weight to the confirmation provided by the local authorities in respect of the Applicant's assessment of the effects of the Proposed Development on health. The ExA also notes that the assessment methodology was agreed with PHE, and moreover PHE did not offer any further comments in response to the submissions to the Examination regarding effects on mental health.
- 5.8.101. While adverse effects on communities have been assessed and mitigated in relation to different topics, drawing these assessments together in one location would have provided all parties with a composite understanding of how the adverse effects interrelate and affect the day-to-day quality of life. The ExA believes that such an approach could have led to an earlier and more holistic approach to the mitigation. In this regard the ExA acknowledges the concerns raised by Corpusty and Saxthorpe PC and many others about the effect of the Proposed Development on health and well-being.
- 5.8.102. The ExA also considers it remiss that the inter-related adverse effects on communities that might be affected by construction traffic but are not on the immediate route of the cable corridor, notably Cawston and Oulton were not considered in the health impact assessment. The ExA considers that the Proposed Development could put a stress on these communities which has not been considered by the Applicant.

Conclusions

Socio-economic

- 5.8.103. The ExA finds the Applicant's assessment as presented in the ES to be in compliance with NPS EN-1 para 5.12.3. The ExA agrees that construction effects would be temporary, and after embedded mitigation the residual effects on the local economy, community infrastructure and tourism would not be significant. The ExA welcomes the inclusion of the OSES and encourages NCC and the Applicant to continue working collaboratively to ensure that the final SES, secured through R33, would be robust and maximise the benefits for the local economy. The ExA considers the cumulative beneficial effects to employment are overstated; and the socio-economic part of the CIA includes projects that

have no certainty, and this approach is not consistent with the CIA in other technical areas. However, the ExA still agrees with the Applicant that the effect of the Proposed Development (alone or cumulatively) would be net positive for direct and indirect employment.

- 5.8.104. Moreover, the ExA concludes that there is a compelling case for delivery of new electricity generation infrastructure from renewable sources to deliver social and economic benefits through cost-efficiencies and competitive availability for industrial, commercial and domestic consumers and transport operations. In that regard, the ExA believes that the Proposed Development would deliver the policy requirements of NPS EN-1 paras 5.12.6, 5.12.7 and 5.12.8, and gives great weight to the making of the Order.

Land use

- 5.8.105. The ExA finds that while the Proposed Development would have an adverse effect on agriculture and farming practices, private water supplies due to installation of the cable corridor, placement of link boxes, surveys, investigations and temporary use of land the proposed mitigation would adequately address the adverse effects. In that regards the Proposed Development meets the policy requirement in NPS EN-1, para 5.10.5, 5.10.6. 5.10.8. The ExA is satisfied that the proposed mitigation would meet the policy requirements of NPS EN-1 para 5.10.15 and is secured in the Soils Management Plan and OCoCP through R20 in the dDCO. The ExA is also content with the general principle embedded in the OCoCP regarding the cable crossing with Hornsea Project Three OWF at Reepham, which would be detailed post consent. With respect to land use matters discussed here, the ExA attributes little weight against the Order being made.

Health

- 5.8.106. The ExA is satisfied that the exposure to EMFs for the Proposed Development and cumulatively with Hornsea Project Three OWF would remain within the ICNIRP exposure guidelines, would meet the relevant PHE guidance and would comply with NPS EN-5 Part 2.10.
- 5.8.107. The ExA acknowledges the qualitative evidence presented by the communities and considers that the Proposed Development would put a stress on the communities affected by construction. In that regard, the ExA considers that the inter-related adverse effects on communities that would be affected by construction traffic but are not on the cable corridor route, notably Cawston and Oulton, should have been considered and presented in the round to get a fuller understanding of how adverse effects interrelate and affect the daily quality of life for the affected communities. The ExA has concluded separately on inter-related matters in Section 5.22.
- 5.8.108. However, the ExA notes that NPS EN-1 states that the aspects of energy infrastructure which are most likely to have a significantly detrimental effect on health are subject to separate regulation (for example for air pollution) which will constitute effective mitigation of them, so that it is

unlikely that health concerns will either constitute a reason to refuse consent or require specific mitigation under the Planning Act 2008 (NPS EN-1, para 4.13.5). The ExA further notes that the Applicant's assessment of the effects on physical or mental health, because it follows the World Health Organisation guidance. The ExA acknowledges that the assessment methodology and findings has been agreed with relevant local authorities. As such, the ExA accepts the Applicant's health assessment and concludes that the policy requirements of NPS EN-1 para 4.13.5 are met. The ExA concludes that the health impact assessment is in line with NPS EN-1, para 4.13.5.

- 5.8.109. Overall, the ExA attributes to health matters little weight against the Order being made.

OFFSHORE MATTERS

5.9. OFFSHORE MARINE BIODIVERSITY, BIOLOGICAL ENVIRONMENT AND ECOLOGY

Background and policy context

Introduction

- 5.9.1. This section of the report deals with the EIA effects of the Proposed Development on marine biodiversity, biological environment and ecology. Natura 2000 sites are subject to Habitats Regulations Assessment (HRA) and are detailed in Chapter 6 of this Recommendation Report. As there is a high degree of overlap between the EIA and HRA process, where relevant, issues are cross-referenced to Chapter 6.
- 5.9.2. Marine biodiversity, including the effects on offshore ornithology and marine mammals during construction, operation and decommissioning, effects on fish, intertidal habitat effects between high tide and low tide marks and subtidal effects below low tide mark, were identified as principal issues in the ExA's initial assessment, as recorded in Chapter 4 of this Recommendation Report.
- 5.9.3. During the course of the Examination it became apparent that, due to the long horizontal directional drilling below the coastal shore platform and cliff base at the landfall as discussed in Section 5.10 below, there would be no effects on intertidal habitats. This issue has not, therefore, been considered further in relation to marine habitats. The remaining principal issues and others raised during the Examination are reported below.

Policy Context

National Policy Statements

- 5.9.4. The Overarching National Policy Statement for Energy (NPS-EN-1) and the National Policy Statement for Renewable Energy Infrastructure (NPS-EN-3) provide the primary basis for decision making on applications for nationally significant renewable energy infrastructure. NPS EN-1 Section 5.5 covers the generic ecology and biodiversity effects which must be addressed. The NPS EN-3 policy tests for offshore ecology address the specific considerations which apply to offshore wind energy, and are as follows:
- a. specific effects on fish, seabed habitats, marine mammals and birds (para 2.6.59);
 - b. whether noise mitigation would reasonably minimise significant disturbance to marine mammals (para 2.6.94);
 - c. a bird collision risk assessment that has been conducted to a satisfactory standard having had regard to the advice from the relevant statutory advisor (paragraph 2.6.104); and
 - d. mitigation of subtidal habitat impact through micro-siting, cable burial and limited use of anti-fouling paints (para 2.6.119).

- 5.9.5. NPS EN-3 also requires the Applicant to undertake ecological monitoring during the construction and operational phases and utilise the results to mitigate impacts and to inform future projects (paragraph 2.6.71).
- 5.9.6. Effects on fishing and fisheries are covered in Section 5.11 of this of this Recommendation Report (Fishing and fisheries).
- 5.9.7. NPS EN-3 also includes policy tests for marine water quality through the disturbance of seabed sediments or the release of contaminants (para 2.6.189).
- 5.9.8. NPS-EN-1 (para 5.3.20) and NPS EN-3 (paras 2.6.191 and 2.6.192) also requires the decision-maker to take account of any mitigation measures that may have been agreed between the Applicant, Natural England (NE) and the Environment Agency (EA) within 3 nautical miles (nm) of the coast or the Marine Management Organisation (MMO) beyond 3nm of the coast, and whether any organisation has granted or refused or intends to grant or refuse, any relevant licences, including protected species mitigation licences.

Marine and Coastal Access Act 2009 (MCAA2009)

- 5.9.9. Marine Conservation Zones (MCZ) are enacted through the MCAA2009 and are areas that have been designated for the purpose of conserving marine flora or fauna, marine habitats or types of marine habitat or features of geological or geomorphological interest. NPS EN-1 states that decision-makers are bound by the duties imposed by sections 125 and 126 of the MCAA2009.
- 5.9.10. Section 125 of MCAA2009 requires all public authorities to exercise their functions in a manner to best further (or, if not possible, least hinder) the conservation objectives of a MCZ. Section 126 also requires them to consider the effect of proposed activities on a MCZ before giving authorisation and imposes restrictions on activities that may have a significant risk of hindering its conservation objectives.
- 5.9.11. Additionally, the Marine Policy Statement 2011 requires decision-makers to take account of how developments will impact on the aim to halt biodiversity loss and the legal obligations relating to all Marine Protected Areas (MPA), including MCZs.
- 5.9.12. The East Inshore and East Offshore Marine Plans 2016 also require cumulative impacts to be addressed (policy ECOL1), appropriate weight to be attached to marine biodiversity (policy BIO1), enhancement of biodiversity and geological interests where appropriate (policy BIO2) and consideration of the overall effects on MPAs to ensure that an ecologically coherent network is maintained (policy MPA1).

Water Framework Directive (WFD)

- 5.9.13. The WFD addresses the quality of inland, estuarine and groundwater bodies including coastal surface waters up to an offshore limit of 1nm.

Onshore water quality considerations are covered in Section 5.7 of this Recommendation Report.

The application

Environmental Statement

- 5.9.14. The Applicant's assessment of impacts on biodiversity is set out in the following documents;
- a. ES Chapter 9 Marine Water and Sediment Quality [APP-222];
 - b. ES Chapter 10 Benthic and Intertidal Ecology [APP-223];
 - c. ES Chapter 11 Fish and Shellfish Ecology [APP-224a]
 - d. ES Chapter 12 Marine Mammals [APP-225];
 - e. ES Chapter 13 Offshore Ornithology [APP-226]; and
 - f. ES Chapter 34 Summary [APP-247].
- 5.9.15. Each of these volumes is supported by appendices that contain figures, technical reports and details of surveys and data collection.
- 5.9.16. The primary marine biodiversity issues in relation to the Proposed Development are the potential impacts of construction activities on benthic ecology, marine mammals, offshore ornithology and biodiversity. Effects on European sites are dealt with in Chapter 6 of this Recommendation Report. This section of the Report considers the EIA effects on benthic species, mammals, offshore ornithology and biodiversity issues.
- 5.9.17. The main EIA issues considered during the Examination comprised:
- a. the useability of the ES at the end of Examination;
 - b. benthic monitoring;
 - c. the effects of cable protection on benthic ecology;
 - d. the capacity to microsite offshore cable to avoid impacts on reef features;
 - e. monitoring changes in seabed topography, including sand wave levelling;
 - f. control of particle size during sediment disposal;
 - g. Sandeel;
 - h. effects of underwater noise on marine mammals;
 - i. cumulative effects of noise on marine mammals;
 - j. population viability analysis for offshore birds;
 - k. assessment of project alone displacement impacts;
 - l. impact assessment of collision and displacement from the Proposed Development on gannet;
 - m. cumulative collision assessment of offshore birds;
 - n. cumulative displacement impact assessment of offshore birds;
 - o. confirmation of the end of construction; and
 - p. timeframe for approval of plans and documents.
- 5.9.18. The ExA examined these issues with reference to the appropriate legislation and policies described in Chapter 3, through written questions and in two ISHs on 22 January and a 'virtual hearing' on 24 July 2020. Concerns relating to these issues were expressed throughout the

Examination by Eastern Inshore Fisheries and Conservation Authority (EIFCA), the Marine Management Organisation (MMO), Natural England (NE), the Royal Society for the Protection of Birds (RSPB), The Wildlife Trusts (TWT) and Whale and Dolphin Conservation (WDC). These concerns are discussed both in this Section in relation to EIA deliberations and in Chapter 6 in relation to HRA considerations.

- 5.9.19. The Applicant has proposed two types of mitigation to minimise adverse effects:
- a. embedded mitigation which is secured through the design of the Proposed Development and through the Outline Code of Construction Practice (OCoCP) [REP18-019] and Outline Landscape and Ecological Management Strategy (OLEMS)[REP14-020];
 - b. additional mitigation, described in Section 6.5.5.2 of ES Chapter 6 [APP-219], which was adopted by the Applicant during the EIA process to reduce or eliminate any predicted significant impacts as detailed in the Schedule of Mitigation [REP6-009] and secured through various control documents and dDCO requirements.
- 5.9.20. Embedded mitigation in relation to marine water and sediment quality is detailed in section 9.7.1 of ES Chapter 9 [APP-222], for benthic and intertidal ecology in section 10.7.1 of ES Chapter 10 [APP-223], for fish and shellfish ecology in section 11.7.1 of ES Chapter 11 [APP-224a], for marine mammals in section 12.7.1 of ES Chapter 12 [APP-225] and for offshore ornithology in section 13.7.1 of ESA Chapter 13 [APP-226].
- 5.9.21. Embedded mitigation includes:
- a. site selection of the Proposed Development to avoid as far as possible designated sites and to use appropriate cable installation methods to minimise effects where designated sites or cable crossings cannot be avoided;
 - b. use of long HDD from an offshore location to the subtidal zone to avoid the intertidal zone;
 - c. reduction of the maximum number of wind turbine generators (WTGs) and removal of floating foundations to minimise disturbance and habitat loss;
 - d. pile-driving would be used in preference to drilling where ground conditions allow to minimise the quantity of sub-surface sediment released into the water column from the installation process;
 - e. a soft start and ramp-up protocol would be used for pile driving to enable mobile species to move away from areas of highest noise impact during installation of foundations;
 - f. scour protection material would be installed where required during construction to mitigate the effects of scour and the associated release of suspended sediment and bed level changes;
 - g. use of an HVDC solution to reduce the number of export cables; use of pre-construction surveys to inform the location of wind WTGs and the routeing of all cables, including micro-siting around sensitive feature where possible;
 - h. minimising cable protection and the effects of electromagnetic fields by burying offshore export cables where possible; all seabed

material arising from the Haisborough, Hammond and Winterton (HHW) SAC during cable installation would be placed back within the SAC using an approach, to ensure that the sediment was available to replenish the sandbank features; and

- i. avoiding the risk of spreading non-native invasive species by following relevant regulations and guidance.

- 5.9.22. No additional mitigation is proposed by the Applicant for any of these topics. The Applicant does explain in ES Chapter 12 [APP-225] that further mitigation measures required to minimise potential impacts of any physical or permanent auditory injury of marine mammals would be included in the Marine Mammal Mitigation Protocol (MMMP) for piling. The MMMP would be developed in the pre-construction period and would be based upon best available information, methodologies, industry best practice, latest scientific understanding, current guidance and detailed project design.

Ecological receptors assessed by the Applicant

- 5.9.23. The Applicant based the study area for consideration of the potential effects of the Proposed Development on marine water and sediment quality on the offshore Proposed Development site, the project interconnector search area and offshore cable corridor.
- 5.9.24. The study area for benthic and intertidal ecology was determined by the Applicant by the extent of potential effects; direct effects were assessed to be within the boundaries of the offshore Proposed Development and indirect effects were determined by the range of potential changes to marine physical processes, deemed to be within approximately 1km of the site boundary.
- 5.9.25. For fish and shellfish ecology, the study area was defined by reference to the International Council for the Exploration of the Sea (ICES) statistical rectangles, which are shown on figure 11.1 of ES Chapter 11 [APP-224a].
- 5.9.26. As marine mammals are highly mobile and transitory, it was necessary for the Applicant to consider the wider North Sea region. For each species of marine mammal study areas were based on the relevant Management Unit (MU) as follows:
- a. Harbour porpoise North Sea MU;
 - b. White-beaked dolphin Celtic and Greater North Seas MU;
 - c. Minke whale Celtic and Greater North Seas MU;
 - d. Grey seal South-east England, North-east England and UK East Coast MUs, and the Wadden Sea region; and
 - e. Harbour seal South-east England MU and the Wadden Sea region.
- 5.9.27. The study area for disturbance and displacement of offshore ornithology was assessed by the Applicant as the Proposed Development site, including the offshore cable corridor.

Issues

The useability of the ES at the end of Examination

- 5.9.28. The MMO [REP2-090] and [REP3-016] expressed concerns about the useability of the Environmental Statement (ES) at the end of Examination. The MMO noted that during the Examination additional information had been supplied by the Applicant, such as clarification documents, additional modelling and addendums etc. These are not easily located alongside the ES and when it comes to using the ES at a later stage for monitoring and enforcement, the MMO considered that it can be extremely challenging to locate the relevant documents post-consent in order to achieve clarity as to what had been consented. The MMO recommended that the ES is updated at the end of Examination to include or highlight these documents.
- 5.9.29. The Applicant [REP4-011] maintained its position that the ES is a record of what is assessed, not what is permitted and therefore does not require any updates. It considers that the relevant parameters consented are set out in the dDCO/DML itself, and that is what should be relied upon post consent
- 5.9.30. After further discussions with the MMO and NE, the Applicant [REP5-045] proposed that its document, 'Note on Requirements and Conditions in the Development Consent Order' [REP4-005] could be updated at the end of the Examination to direct the regulator to the most up to date versions of each document. Both the MMO and NE were in agreement that an updated note would be helpful and that it should make clear that the DCO and certified documents override previous parameters if different from those presented in the ES. However, NE's [REP5-077] preferred approach was to update the ES at the end of Examination to ensure the final ES reflected the parameters permitted.
- 5.9.31. The SoCG between the Applicant and the MMO [REP16-009] records that the parties agreed that Schedule 18 of the DCO would provide a list of the final versions of the documents that should be used if the Order was made. The Applicant incorporated the ES Chapter references for the "*Examination documents forming part of the environmental statement*" within Part 1 of Schedule 18 of the dDCO [REP18-009].
- 5.9.32. The ExA agrees with the Applicant that the ES is a record of what has been assessed at the time of preparation and that it should not be updated. However, the ExA also understands the position of the Regulators, who have to monitor and enforce the Order if made. The ExA is content with the compromise that Schedule 18 of the rDCO should clearly identify the final documents containing the parameters to be used for monitoring and enforcement. The ExA includes Schedule 18 in its rDCO at Appendix D of this Recommendation Report.

Benthic monitoring

- 5.9.33. The MMO [RR-069] expressed concern that the Offshore In Principle Monitoring Plan (OIPMP) only proposes monitoring of *Sabellaria spinulosa* (*S. spinulosa*) reef and not wider benthic impacts. The Applicant [AS-

024] responded that the findings of the benthic ecology assessment did not warrant a full-scale programme.

- 5.9.34. This issue was examined by the ExA both through WQs and at ISHs. The final position is given in the SoCG between the Applicant and the MMO [REP16-009]. Both parties agree that the OIPMP would provide an appropriate framework to agree monitoring requirements with the MMO, subject to any developments/amendments. The MMO and its Scientific Advisors recognise that the updated text in the OIPMP allows for the scope of the benthic surveys to be increased post consent if there is good justification to do so.
- 5.9.35. NE [REP10-038] is in agreement that the OIPMP provides an appropriate framework to agree monitoring with the MMO in consultation with NE. NE did not specifically raise the issue of monitoring of wider benthic impacts during the Examination.
- 5.9.36. Therefore, the ExA is content that this matter is agreed.

The effects of cable protection on benthic ecology

- 5.9.37. Cable protection within designated sites was of significant concern to NE [RR-099], the MMO [RR-069], Caister Inshore Fisherman's Association [RR-091] and the Eastern Inshore Fisheries and Conservation Authority (EIFCA) [RR-035] throughout the Examination. The HRA implications of these concerns are examined in Chapter 6 of this Recommendation Report.
- 5.9.38. In terms of EIA, NE expressed concern that the impacts from cable protection could have the potential to persist and have been considered by the Applicant to be permanent habitat loss. NE continues that cable installation in sandbank sites has also been shown to be challenging due to impacts from sandwave clearance and the use of hard substrate as cable protection [RR-099].
- 5.9.39. NE advised that areas with protected sandbanks should be avoided where possible. The Applicant [AS-024] confirmed that it was committed to reducing cable protection for unburied cables within designated sites from 10% to 5% of cable length. This is secured in the dDCO [REP18-009] and Outline Scour Protection and Cable Protection Plan (SPCPP) [REP14-029] which specifies a contingency of up to 4km of cable protection, rather than 8km, which could result in a loss of 20,000m² of sandbank.
- 5.9.40. NE [REP7-051] welcomed the reduction in the quantity of cable protection estimated to be required but noted that the amount of cable protection that would actually be required can only be known once, or shortly before, cable laying starts.
- 5.9.41. The ExA accepts that the Applicant has made every effort to reduce the amount of cable protection within sandbanks and that the 5% secured is a contingency in the event that unsuitable ground conditions were encountered, which would not be exceeded. However, for the reasons

detailed in Chapter 6 of this Recommendation Report, the ExA advises that due to the uncertainties related to sandbank modelling and changes to sediment composition due to disposal of dredged material there remains doubt over whether the sandbanks would fully recover following installation of cable protection.

- 5.9.42. The MMO [RR-069] had significant concerns regarding the implication that new cable protection works would be considered by the Applicant to be licenced for deployment at any time during the operation of the works. The MMO contended that there is no consideration in the ES of the impacts from deploying cable protection up to twenty-five years following construction. If further construction works could occur at any point in the operational lifetime then the MMO considered that the ability of the habitat to recover would be in question. It also raised questions about consideration of disturbance impacts to both ecological receptors as well as socio-economic receptors.
- 5.9.43. The MMO considered that the deployment of cable protection is not covered by the definition of maintain in either the DCO or DMLs and would be considered part of construction. In the MMO's view, once the construction period has ended any subsequent construction activities would need to be separately licenced. It requested that it is made explicit within the outline offshore operations and maintenance plan (OOOMP) that cable protection may only be deployed during construction, and deployment at any other time during the operational lifespan would be approved through separate licence applications.
- 5.9.44. NE [RR-099] had similar concerns, stating that the SPCPP did not cover any operation and maintenance (O&M) placement of protection. NE would not support the Applicant wanting the ability to use up to the consented amount of cable protection at any point over the lifetime of the project. Like the MMO, it required the amount included on the face of the DCO/DML to be for installation only.
- 5.9.45. These issues were examined through WQs and at the ISHs. By the end of the Examination, the Applicant [REP16-009] confirmed that new areas of cable protection required during the operation stage would be subject to a separate marine licence. This is secured through the HHW SAC Cable Specification, Installation and Monitoring Plan (CSIMP) [REP14-031].
- 5.9.46. The ExA is therefore content that cable protection as described in the rDCO and associated plans may only be deployed during construction and that any new cable protection required during operation would be the subject of a separate licence application.
- 5.9.47. Turning to O&M cable remediation activities, NE [RR-099] maintained that there would be a risk that *S. spinulosa* reef could establish across the cable corridor or nearby areas where remediation activities needed to occur. Accordingly, it considered that every effort should be made, with input from the MMO and NE, to minimise such impacts at the time of undertaking the works. The Applicant responded [AS-024] that it would be willing to consult with the regulators prior to undertaking intrusive

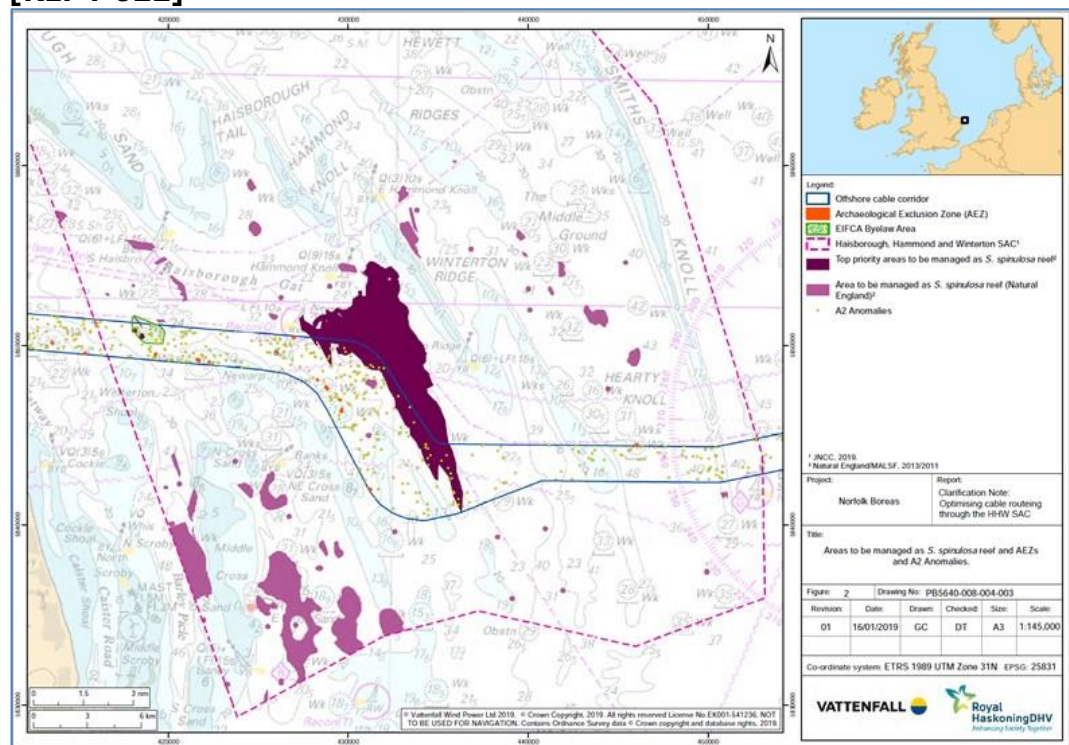
maintenance, and this is included in the CSIMP which is a certified document in Schedule 18 of the rDCO [REP14-031].

- 5.9.48. NE [RR-099] also strongly encouraged the removal of decommissioned cable rather than the use of cable protection where remediation in discrete areas was necessary, such as at cable crossings. In its SoCG with NE [REP16-010], the Applicant committed to decommission cable protection at the end of the project life where it was associated with unburied cables due to ground conditions. To ensure that cable protection would be suitable for decommissioning the Applicant would not employ rock or gravel dumping within the HHW SAC apart from where required at cable crossings. This is secured in Condition 3(1)(g) of the Transmission DMLs (Schedules 11 and 12 of the rDCO).
- 5.9.49. By the end of the Examination, both parties agreed that it would be preferable to cut and remove redundant cables where possible subject to the agreement of cable owners [REP16-010]. This is included in the certified CSIMP [REP14-031].
- 5.9.50. Referring to cable crossings, the MMO [RR-069] understands the Applicant to have included the cable crossings in the total cable protection within the dDCO. The MMO required additional detail of the number of crossings to ensure that all licensed activities would be limited to the maximum parameters assessed in the ES. It considered that the specifics relating to the deployment of cable protection are an important factor which needs to be acknowledged within the DCO/DMLs.
- 5.9.51. By the end of the Examination, the Applicant [REP16-009] still did not consider it necessary to include a maximum number of cable crossings in the DMLs, as it considers that the limits on cable protection in the SPCPP to be the salient measures in this respect. However, the Applicant has included the total number of crossings for the HHW SAC given its status as a designated site. This detail is secured in the certified HHW SAC SIP [REP14-033] and CSIMP [REP14-031] in the rDCO. The MMO is content with this [REP16-009].
- 5.9.52. Caister Inshore Fisherman's Association [RR-091] expressed concern about the effect of sediment contaminating the seabed during cable laying, resulting in brown and pink shrimp and bottom feeding fish disappearing from the area. The Applicant [AS-024] referred to the detailed assessment of potential effects of the Proposed Development on water and sediment quality in Chapter 9 of the ES [APP-222]. The assessment indicates very little sediment contamination as a result of the construction, operation and decommissioning of the Proposed Development within the offshore project area. Consequently, the Applicant considers that detrimental impacts on fish and shellfish populations as a result of contaminated sediment are not expected.
- 5.9.53. There was no further submission from Caister Inshore Fisherman's Association during the Examination and in the absence of evidence to the contrary the ExA accepts the Applicant's position

The capacity to microsite offshore cable to avoid impacts on reef features

- 5.9.54. NE [RR-099] questioned the Applicant's ability to effectively implement micro-siting or routing around *S. spinulosa* reef, as NE maintained that the addition of hard substrata was often incompatible with conserving sandbanks and reef features. Eastern IFCA [RR-035] also requested that all possible efforts were made by the Applicant to microsite the cable route within the cable corridor to avoid Restricted Area 36 of Eastern IFCA's proposed Marine Protected Areas shown on Figure 5.9.1 below.

Figure 5.9.1: EIFCA Bylaw Area (Restricted Area 36), extract from [REP4-022]



- 5.9.55. This issue was examined by the ExA both through WQs and at ISHs. The HRA implications of these concerns are examined in Chapter 6 of this Recommendation Report.
- 5.9.56. The Applicant [REP6-013] maintained throughout the Examination that it would be committed to avoiding all areas of confirmed *S. spinulosa* reef, where possible, within the cable corridor by conducting a seabed survey prior to installation and micro-siting to avoid damaging such areas. Given it is not possible to be absolutely certain what the extent of *S. spinulosa* may be in the future, the Applicant included in its mitigation to avoid reef "where possible". It considered that this was appropriate given the Applicant's confidence in the ability to microsite on the basis of currently known information; the very low possibility of this changing prior to cable installation to an extent that micro-siting would no longer be possible; and the package of mitigation measures proposed which would ensure that any residual impacts on reef would be inconsequential or de minimis.

- 5.9.57. In its SoCG with the MMO [REP16-009], the Applicant agreed that the only locations where micro-siting would not be possible were at cable crossings.
- 5.9.58. NE in its SoCG [REP16-010] advised that all reef, including patchy reef, should be avoided by micro-siting. However, throughout the Examination NE were not confident that this would be possible. NE confirmed [REP10-065] that as set out in D9 [REP9-045], the ability to micro-site remains an unresolved issue. By the end of the Examination [REP16-010], the final position is that the Applicant and NE do not agree whether micro-siting around *S. spinulosa* reef would be possible with any certainty.
- 5.9.59. The Applicant maintains that available data shows that micro-siting would be possible at the current time and due to the fact that the current level of fishing pressure within the designated site is low it is unlikely that restrictions on fishing activity would significantly increase the extent of *S. spinulosa* reef within the designated site and therefore micro-siting would still be possible at the time of construction. It also contends that if it is not possible to avoid *S. spinulosa* reef completely the area affected would be small and recovery would be rapid.
- 5.9.60. NE maintained that there remains a risk that the extent of *S. spinulosa* reef at the time of construction may be such that micro-siting is not possible. NE conclude that no *S. spinulosa* reef should be affected and do not consider that there is enough comparable evidence that the reef would recover from cable installation.
- 5.9.61. As explained in Chapter 6 of this Recommendation Report, the ExA is concerned that there is insufficient scientific evidence to understand the impact of disruption to reef features and their ability to recover. It has carefully considered the advice given by NE, as the Government's statutory advisors, and the fact that the Applicant accepts that scientific certainty is not possible to obtain. The ExA therefore concludes, as it does in Chapter 6, that micro-siting of cables may not be possible through areas of reef and does not preclude the loss of *S. spinulosa*.

Monitoring changes in seabed topography, including sand wave levelling

- 5.9.62. There was much discussion between the Applicant, NE, the MMO and the ExA throughout the Examination regarding the potential effects of levelling sandwaves within the cable corridor to allow for cable laying operations. The HRA implications of these concerns are examined in Chapter 6 of this Recommendation Report.
- 5.9.63. The MMO [RR-069] noted that ES Chapter 8 [APP-221] refers only to an average (presumed 3m) depth for sand wave clearance, where previously a range between less than 3m and 9m had been mentioned. The MMO requires clarity on whether there are still areas of sandwaves which would be subject to lowering by 9m. The implication of the sandwave levelling report [APP-206] is that the target burial depth would be achieved by removal of sandwave crests which would be expected to reform over the buried cable. In its RR, the MMO raised concerns that the

material needed to reform the sandwave crest may be partly derived from the levelled area, which would be exposed to hydrodynamic forcing and hence subject to potential erosion, reducing the burial depth of the cables.

- 5.9.64. In its RR [RR-099] NE considered that there is currently no evidence to demonstrate that sandwave levelling ensures cables remain buried with no need for future reburial or cable protection. Whilst this has been asserted by a number of potential developers, NE are yet to understand if this is the reality. NE advise that any sandwave levelling, if agreed between the Applicant, NE and the MMO, must have detailed monitoring before and after the activity, with method and frequency to be agreed with NE in order to monitor impact and recovery. This would need to be secured in the DML and implemented as a specific license condition.
- 5.9.65. The MMO agree with NE that the science of sandwave reformation is not yet widely understood and this implies a need to develop a clearly targeted plan of monitoring of post-development recovery as a minimum requirement based on detailed design information. The MMO recommended that this is part of post consent monitoring should the Order be made.
- 5.9.66. The Applicant [AS-024] in its response to NE's RR stated that it was confident that the larger sandwaves could be avoided and do not anticipate the need to level sandwaves above 5m in height.
- 5.9.67. The Applicant [AS-024] stated that the Offshore IPMP [REP14-028], which is secured in the dDCO and has to be approved by the MMO, secures one pre- and one post-construction survey. It also states that: *"further surveys may be required at a frequency to be agreed with the MMO (e.g. 3 years non-consecutive e.g. 1, 3 and 6 years or 1, 5 and 10 years). If evidence of recovery is recorded and agreed with the MMO, monitoring will cease."*
- 5.9.68. At D9, the MMO [REP9-023] agreed that the IPMP provides an appropriate framework to agree monitoring requirements with the MMO subject to any developments/amendments.
- 5.9.69. At D10, NE [REP10-065] could not agree to the monitoring as set out in the IPMP. NE considered that further detail should be provided within the IPMP on pre- and post-construction surveys. The Applicant considered that the level of detail provided is sufficient for an IPMP and that further detail would be agreed with the MMO and NE and provided in the final plan.
- 5.9.70. After examination through WQs and at the ISHs, the final position given in NE's SoCG [REP16-010] regarding sandwaves and other sandbank bedforms is that it could be agreed that *S. spinulosa* reef and sandbank communities could recover if it could be proven that sandwave levelling would ensure that cables would remain buried. The Applicant's position was that sandwave levelling would ensure that the cables would remain buried.

- 5.9.71. NE acknowledged that the additional evidence, assessment and mitigation measures proposed by the Applicant have considerably reduced the risk of adverse impacts on *S. spinulosa* reef and sandbank communities. However, NE maintained that there remain uncertainties such that it is unable to advise, beyond all reasonable scientific doubt, that there would be no adverse effects.
- 5.9.72. The MMO [REP 16-009] defers to NE for conservation advice but considered that monitoring of the sandwave recovery following sweeping should be carried out to ensure that effects were in line with those projected in the ES. In its SoCG with the Applicant [REP16-010] NE agreed that the IPMP [REP14-027] would provide an appropriate framework to agree monitoring with the MMO in consultation with NE.
- 5.9.73. After careful consideration of the evidence and position of all parties, the ExA concludes that monitoring of changes in seabed topography, including sand wave levelling, is adequately secured through the IPMP.

Control of particle size during sediment disposal

- 5.9.74. NE and the MMO expressed concerns during the Examination about the location of disposal sites for sediments arising from construction operations. In particular, there were concerns regarding disposal of sediments from any sandwave levelling. The HRA implications of these concerns are examined in Chapter 6.
- 5.9.75. NE [RR-099] advised that an in-principle sediment disposal strategy should be undertaken and provided as part of the consenting process. It was concerned about locations for disposal areas and what guarantees there would be that seabed material from cable installation would remain within the benthic system and that the dredge material would be >95% similar in particle size to disposal locations. This concern was examined through a series of questions and at the ISHs, with the results as recorded below.
- 5.9.76. The MMO [RR-069] questioned why the Applicant based its assessment of increased suspended sediments on expert judgement rather than hydrodynamic modelling, which the MMO considered would be necessary given the magnitude of the disposal operations and the long-term nature of disposal. The MMO noted that in section 6.1.1.2 of the Proposed Sediment Disposal Sites-Site Characterisation Report [APP-706] it is stated that suspended sediment is based on the modelling undertaken for East Anglia THREE OWF. The MMO has concerns on the risk of using this approach.
- 5.9.77. The Applicant responded [REP1-042] that its assessment uses modelling simulations undertaken for the East Anglia ONE OWF as a proxy for the Proposed Development as the sediment characteristics are largely similar at both sites. It also noted that this approach was also used for both East Anglia THREE and Norfolk Vanguard; the latter being closer to sensitive receptors compared to that of the Proposed Development. The MMO [REP9-023] confirmed its agreement that further hydrodynamic modelling is not required for the assessment.

- 5.9.78. The Applicant proposed [APP-223] to dispose of sediments resulting from pre-sweeping and drill arisings at least 50m from any known *S. spinulosa* reef which would minimise the direct impact of smothering the benthic assemblage. Although this was in accordance with advice from NE in relation to the Norfolk Vanguard OWF, the MMO recommends that the 50m standoff is assessed against current dredge disposal site requirements, e.g. when disposal of material must be outside of exclusion zones, and a decision made as to whether 50m would be sufficient to be in line with those site requirements. NE also questioned the 50m buffer [RR-099], stating that a 500m buffer was normal, and therefore further justification for a reduced buffer should be considered to ensure a consistent approach across sites and industry.
- 5.9.79. NE's and the MMO's concerns were addressed throughout the Examination, and by D10 agreement was reached with both NE [REP16-010] and the MMO [REP16-009] that the commitments secured in HHW SAC CSIMP [REP14-031] and HHW SAC SIP [REP14-033] were satisfactory. The commitments are:
- a. Priority 1 – material to be disposed of no closer than 50m to any *S. spinulosa* reef;
 - b. Priority 2- dispose of material up drift of the cable route, to allow infill to occur as quickly as possible following cable installation; and
 - c. Priority 3 - Dispose of material as close as possible to cable route.
- 5.9.80. The Applicant also made the commitment that should sandwave levelling be required and permitted, material would be disposed of using a fall pipe employed by the dredging vessel which would dispose of material close to the seabed.
- 5.9.81. Drill arisings would require disposal at sea only if a monopile or jacket foundation was used. The MMO noted that these arisings could potentially contain chalk which could act to alter the sediment composition of the receiving seabed, particularly if disposal was localised to one region within the area proposed for licencing. This could lead to a region of altered benthic habitat which may not recover to the baseline state due to the different sediment characteristics. The MMO recommended [RR-069] this potential risk to be addressed by the Applicant during the Examination.
- 5.9.82. The Applicant [AS-024] believed it to be highly unlikely that chalk contained in drill arisings would cause an impact to the benthic habitat for the following reasons:
- a. the geotechnical and geophysical data show that due to the ground conditions, it is very unlikely that any drilling would be required as piles would be driven rather than drilled;
 - b. the underlying strata are largely muds and clays, and do not contain chalk;
 - c. the volume of any drill arisings would be extremely small relative to the total volume of sediment being transported through the site under natural processes and therefore these arisings would be either covered by other sediment or dispersed.

- 5.9.83. At D6, the MMO [REP6-045] stated that it was content that the issue had been dealt with and no further information was necessary.
- 5.9.84. The MMO requested the Applicant to identify where the following requirements have been captured within the DMLs: the information on the planned disposal schedule, sediment characteristics of any drill arisings and location where they would be disposed of, along with a more accurate assessment of the potential impacts.
- 5.9.85. The Applicant provided a response [AS-024] explaining that there is a commitment in the HHW SAC SIP (which has been transferred to the HHW SAC CSIMP) to provide this information and Condition 14(1)(d) of Part 4 of Schedules 9 and 10 of the DCO states that the OPEMP [REP5-035) includes the following scope:
- "A project environmental management plan (in accordance with the outline project environmental management plan) covering the period of construction and operation to include details of ...(iii) waste management and disposal arrangements".*
- 5.9.86. The final PEMP would require agreement with the MMO in consultation with the SNCB. In addition, a Site Characterisation Report was agreed with the MMO, and the Site Disposal References have been secured in the DMLs in the dDCO [REP18-009].
- 5.9.87. The MMO agreed with the Applicant's response [REP16-009]. After considering the evidence, the ExA is content that control of particle size during sediment disposal is adequately secured in the rDCO and the MMO has surety of involvement in the final controls within the PEMP.
- 5.9.88. Considering all of the evidence submitted during the Examination, the ExA is content that there are no outstanding issues in relation to disposal of sediments.

Sandeel

- 5.9.89. The MMO [RR-069] noted that offshore foundation installation (which is expected to be undertaken over a period of 18 months) would coincide with the winter hibernation period for sandeel. During this period, sandeel would be more vulnerable to construction activities. The MMO acknowledge that the overall installation footprint would be minor in the context of the wider project area, and it therefore surmises that relatively low direct mortality levels would be associated with the foundation installation process themselves. However, the MMO recommends the Applicant includes consideration of the installation timing and the associated higher potential impacts to sandeel during the winter hibernation period within the ES.
- 5.9.90. In its SoCG with the Applicant [REP16-009], the MMO agrees that after further discussions at D2, the ES does not need to be updated and that the main concerns regarding sandeel were due to a lack of data over a wider scale and therefore mainly relate to cumulative impacts. Therefore,

it agreed that the list of potential impacts assessed in the ES are appropriate.

- 5.9.91. In respect of cumulative effects resulting from disturbance to habitat and temporary and permanent loss of habitat, the MMO [RR-069] considered these not to have been fully addressed and that the Applicant has not considered whether the area would become important for this species as other areas become unavailable. The MMO recommends further information to be provided by the Applicant.
- 5.9.92. Cumulative effects for sandeel were discussed throughout the Examination between the Applicant and the MMO and examined by the ExA through the ISHs and WQs. By D6, [REP16-009] both parties agree that the lack of detailed information on the spatial distribution and abundance of sandeels at a North Sea wide scale make the assessment of cumulative effects difficult. Both parties also agree that the potential contribution of the project to any cumulative impact would be very small.
- 5.9.93. In its RR [RR-069], the MMO also recommends conducting post-construction sandeel habitat assessments based on the collection of seabed sediment samples for particle size analysis to ascertain the continued habitat suitability. This information should be compared with the pre-construction data and post-construction survey years to highlight any changes that would have occurred. The Applicant [REP5-045] proposed to extend the scope of benthic surveys, to include sediment sampling, if at the time of completion of the final detailed plan there was good, evidence based, justification for this. This was to be secured in the IPMP. A form of words agreed at D7 [REP7-016] was included as para 38 of the IPMP [REP14-027]:

"As explained in section 4.3.2, if at the time of completion of the final detailed plans there is good, evidence based, justification for increasing the scope of the benthic surveys this will be agreed with the MMO and included within the final plans. If a scope increase for the benthic surveys included sediment sampling within the windfarm site for the purpose of Particle Size Analysis, the data from that survey could be used to better understand any changes in habitat suitability for sandeels. This methodology for undertaking such a study would be agreed with the MMO through the final plan."

- 5.9.94. Post-construction monitoring of sandeel as secured in the IPMP is recorded as being agreed in the SoCG between the Applicant and the MMO [REP16-009] and there was no further discussion between the MMO or any other IP and the Applicant during the Examination. The ExA is, therefore, content that this issue has been resolved.

Effects of underwater noise on marine mammals

- 5.9.95. The HRA implications of underwater noise on marine animals are examined in detail in Chapter 6.
- 5.9.96. The MMO [RR-069] notes that the cumulative sound exposure level scenarios for marine mammals in the ES [APP-225] consider the risk of

Permanent Threshold Shift (PTS) from the repeated percussive strikes required to install a single monopile or four pin piles. It states that the US National Oceanic and Atmospheric Administration marine mammal noise exposure criteria used by the Applicant are based on an accumulation period of 24 hours. Therefore, the MMO maintains that the risk assessment is only valid under the assumption of a single pile being installed per 24-hour period and recommends that this is reflected in the DCO/DMLs.

- 5.9.97. The MMO continues, if the Applicant would like to allow for the installation of more than one pile per 24-hour period, then scenarios reflecting the worst-case number of piles to be installed per 24 hours should be included in the application.
- 5.9.98. The Applicant responded [AS-024] that Southall et al. (2019) note “*that in many realistic exposure conditions, the 24-h rule for SEL ‘reset’ may be inappropriately long and further scientific investigation of these issues, especially for species with some existing TTS data, is clearly needed.*” Therefore, the Applicant considers that this would be taken into account, if required, when developing the MMMP and SIP pre-construction based on the latest guidance, scientific evidence and information. The Applicant also noted that piling is not continuous for subsequent piles, even pin-piles for jackets, as there are breaks between piling in order to move to and get the next pile into position.
- 5.9.99. At D6, the MMO [REP16-009] agreed that the development and management of the SNS SAC SIP and MMMP (both within and without designates sites) is where, if required, any issue of concurrent piling within the project and cumulatively and the number of piles to be installed in a 24 hour period could be assessed further, to determine if any restrictions or mitigation would be required. This is discussed in more detail in Chapter 6.
- 5.9.100. WDC, in its RR [RR-056] expressed particular concern about the potential for cetaceans to be disturbed and displaced, including by the noise introduced into their environment. WDC’s concerns are particularly related to noise during the construction phase as this is the stage where there is the greatest potential to negatively impact cetaceans.
- 5.9.101. WDC maintains that research has shown that pile driving during construction causes behavioural changes in harbour porpoises which leave the area during construction and in the majority of instances did not later return to their usual numbers. The longest running study into the effects of windfarms on harbour porpoises shows that ten years later, the population has only recovered to 29% of the baseline level.
- 5.9.102. Harbour porpoises feed almost continuously to meet energy needs and are therefore highly sensitive to disturbance. Loud noises, such as pile driving, can cause them to be displaced from potential important feeding grounds. Given the importance of the Proposed Development area and the SNS SAC for harbour porpoise, most likely as prime foraging areas,

WDC considers that displacement from the area could be very significant. This is discussed in greater detail in Chapter 6 .

- 5.9.103. WDC at [REP2-112] accepts that the Applicant has used an appropriate methodology to assess the impacts of pile driving on harbour porpoises. However, where possible this has taken into account the embedded mitigation when assessing the potential magnitude of each effect. WDC does not agree with this approach as it considers that the embedded mitigation measures are unproven, and this approach would lead to inaccurate and misleading results. WDC summarises that its key recommendations for the Proposed Development are:
- a. foundations requiring piling are not used;
 - b. pile driving is not used at all during construction;
 - c. if its recommendation of no pile driving is disregarded, that strict limits be placed on noise levels during construction, including cumulative noise;
 - d. only proven mitigation methods (such as a bubble curtain) are in place around the source to mitigate the impacts of radiated noise levels;
 - e. that WDC is included as a consultee on the design of the MMMPs and SIP;
 - f. that the monitoring strategy is appropriate to consider cumulative impacts of all developments in the region;
 - g. ground-truthing of modelled noise assessment data should be undertaken; and
 - h. an assessment report is publicly available within a reasonable timeframe of construction completion.
- 5.9.104. In response, the Applicant [AS-024] stated that piling has been assessed as worst-case, but other foundation options would be considered. The requirement for pile driving would be based on several factors, such as underlying ground conditions and the safest way to successfully install and operate the WTGs. The most suitable foundation options for the site would be determined during final design, post consent, and would be informed by further site investigations.
- 5.9.105. If piling was required, then the need for additional noise mitigation measures would be developed during the finalisation of the MMMP in the pre-construction phase. The Applicant also expanded its commitment in the DMLs to restrict hammer energy to 5,000kJ for monopile foundations and 2,700kJ for pin piles.
- 5.9.106. At D3 [REP3-007] the Applicant responded that the SNS SAC SIP [REP5-042] includes noise reduction as a potential mitigation option. The SIP provides the framework for agreeing mitigation measures with the MMO prior to construction. Regarding proven mitigation methods, the Applicant states that noise reduction measures, including bubble curtains, are included in the MMMP [REP5-033] and SIP as a potential mitigation option. However, developing and finalising the MMMPs and SIP preconstruction would allow the Applicant to take into account the latest, most effective, suitable and proven mitigation measure.

- 5.9.107. While the Applicant [REP3-007] has committed to consult with WDC in the initial review of the SIP and to provide the updated plan to WDC when submitted to the MMO and NE for review and approval, it is at the MMO's discretion which stakeholders to consult. Similarly, the MMO would decide which stakeholders to consult for the MMMP.
- 5.9.108. With regard to the monitoring strategy, the Applicant refers to Section 4.5.2 of the IPMP [REP14-027] which acknowledges that there may be little purpose or advantage in site specific monitoring and a strategic approach may be more appropriate in providing answers to specific questions where significant environmental impacts have been identified at a cumulative level. The IPMP also provides outline proposals for construction noise monitoring (if pile driving is required) of the first four piled foundations of each foundation type to be installed.
- 5.9.109. Finally, the Applicant states that reporting of monitoring results would be submitted to the MMO at a timeframe agreed through the Construction Programme and Monitoring Plan.
- 5.9.110. The ExA concludes that as the MMO [REP4-035] agree that there is no need for the Applicant to undertake further noise modelling and no concerns about the Applicant's approach to assessment were raised by NE, the Applicant has used an appropriate methodology to assess the impacts of noise on harbour porpoises. Mitigation for the effects of piling in relation to permanent auditory injury is secured through Condition 14 (f), Schedules 9,10 and 11 and Condition 9(f) of Schedule 12 of the dDCO [REP18-009]. These conditions/requirements commit the Applicant, in the event that piled foundations are used, to produce an MMMP in accordance with the dMMMP [REP5-033]. Condition 19 of Schedules 9 and 10 and Condition 14 of Schedules 11 and 12 require noise monitoring to be undertaken if piling is proposed.
- 5.9.111. After careful consideration of the evidence and position of all parties, and the uncertainties around the effects of noise on Cetaceans, the ExA is content that the effects of noise on marine mammals have been properly considered by the Applicant.

Cumulative effects of noise on marine mammals

- 5.9.112. As noted in its RR the MMO [RR-069] has a concern in relation to cumulative effects of underwater noise on marine mammals. The MMO requires that a condition is added to the DMLs to prevent concurrent piling within the project and between the Proposed Development and the consented Norfolk Vanguard OWF.
- 5.9.113. NE's advice [RR-099] regarding cumulative noise effects is similar to other recent NSIP applications, that a mechanism needs to be developed by the regulators to ensure continuing adherence to the SNCB thresholds over time. It predicts that multiple SIPs will be developed, piling can take place over several years, and new projects can come online during this time. Should potential exceedance of the thresholds occur, a process for dealing with this issue needs to be in place and the affected developers

and industries will need to work together with the regulator and SNCBs to prevent adverse effect on the Southern North Sea (SNS) SAC.

- 5.9.114. Until the mechanism by which the SIPs will be managed, monitored and reviewed is developed, NE is unable to advise that the Applicant's approach is sufficient to address the cumulative impacts and therefore the risk of adverse effect on integrity on the SNS SAC cannot be fully ruled out.
- 5.9.115. NE acknowledges that this is not an issue unique to this project and work would need to be undertaken to reduce the noise levels of multiple OWFs potentially being constructed at the same time.
- 5.9.116. TWT [RR-040] expressed similar concerns regarding the impact of underwater noise from construction on marine mammals. In particular, it is concerned about cumulative underwater noise disturbance impacts on the harbour porpoise North Sea Management Unit and cumulative disturbance within the SNS SAC.
- 5.9.117. TWT considers that the SIP lacks detail and therefore in its current form it is not adequate. More detail should be provided on the effectiveness of the proposed mitigation as outlined in the SIP. This should include referenced examples of how the implementation of mitigation would reduce underwater noise disturbance impacts within the SNS SAC. Noise modelling should also be undertaken to demonstrate the degree of noise reduction which could be achieved through mitigation.
- 5.9.118. TWT also refers to the lack of a regulatory mechanism to manage cumulative underwater noise impacts. Defra and the Southern North Sea Regulators Working Group are taking positive steps to develop effective management for cumulative underwater noise impacts and TWT will continue to work closely with all stakeholders on this. However, as management mechanisms are currently not in place, TWT suggest the Planning Inspectorate and the Secretary of State considers what controls need to be put in place to ensure no adverse effect on the SNS SAC at this current time.
- 5.9.119. In response to examination of cumulative noise within the South North Sea at the ISH on 22 January 2020 [EV7-003] and [REP4-024], the MMO [REP6-046] explained that a Regulators Group has been meeting with BEIS, who was finalising development of a management tool to cover all noise activity in the South North Sea. The tool would be published for all industries to use when completing cumulative assessment for noise. The MMO updated the ExA on the progress with this tool throughout the Examination.
- 5.9.120. At D7 the MMO [REP7-040] reported that a mechanism had been agreed in the form of a tool which had been created to manage the noise in the SNS across the different regulators. The tool was made available through the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) website [REP13-035]. At this time, NE was invited to join the

Regulators Group to agree the mechanism for formal recognition of the tool by industry and SNCBs.

- 5.9.121. The MMO attended a meeting of the Regulators Group on 1 October 2020 [REP18-036], the last meeting held before the Examination closed. At this meeting further information on the purpose of the activity tracker and guidance on its use to go alongside the activity tracker located on the OPRED website was discussed. The Regulators Group confirmed that NE and other SNCBs will be part of the discussions going forward.
- 5.9.122. After considering all of the evidence relating to cumulative effects of noise on marine mammals, the ExA understands that NE, WDC and TWT have concerns about the lack of a mechanism to manage cumulative construction effects from OWFs in the North Sea. However, the ExA notes that the MMO which is the relevant regulator for marine activities, does not share these concerns.
- 5.9.123. The ExA accepts that the activity tracker is still under development but that it is publicly accessible at this time. It has no reason to believe that by the time piling activities for the Proposed Development commence in the South North Sea the tracker would not be fully operational and useful for strategically controlling noise activities to protect marine mammals.
- 5.9.124. The ExA concludes that while NE, WDC and TWT have outstanding concerns related to cumulative effects of noise on marine mammals, the management solutions are strategic and not within the scope of the application or this Examination to resolve. Otherwise, the ExA is satisfied that there are no other outstanding issues relating to cumulative effects.

Offshore Ornithology

- 5.9.125. One of the major areas of examination was around the assessment of effects of the Proposed Development on offshore bird species. The HRA implications of both the assessment methodology and implications of the assessment on designated sites are discussed in detail in Chapter 6.
- 5.9.126. NE in its RR [RR-099] had a number of issues in relation to the assessment of offshore ornithology:
- a. breeding season apportionment of impacts for kittiwake and lesser black-backed gull (LBBG) in HRA;
 - b. calculation of gannet colony baseline mortality in HRA;
 - c. consideration of range of predicted impacts due to variability (uncertainty) in EIA and HRA assessments;
 - d. assessment of displacement impacts;
 - e. collision risk modelling (CRM) and input parameters;
 - f. cumulative and in-combination assessments (displacement and CRM);
 - g. additive impacts (collision plus displacement for gannet);
 - h. population modelling (EIA and HRA); and
 - i. scale of predicted cumulative and in-combination impacts and requirement for mitigation.

- 5.9.127. The RSPB [RR-054] had similar significant concerns related to the Proposed Development's alone and cumulative collision risk and displacement impacts.
- 5.9.128. These concerns formed a major part of the Examination and were examined in relation to both EIA and HRA effects. To avoid repetition, detailed discussions related to the modelling of cumulative impacts assessment and CRM and population modelling are presented in Chapter 6 of this Recommendation Report.

Population viability analysis for offshore birds

- 5.9.129. NE [RR-099] considered that the use by the Applicant of the Crown Estate Strategic Ornithological Support Services SOSS-04 Gannet Population Viability Analysis (PVA) and the EIA PVA models for kittiwake and GBBG were not adequate to inform the assessments because:
- a. the stochastic simulations were not run as matched pairs;
 - b. NE recommends using the counterfactual of population growth rate and the counterfactual of population size to quantify the relative changes in a population in response to anthropogenic impacts; and
 - c. the PVA models were only run over 25 years and the Proposed Development would have a lifespan of a maximum of 30 years.
- 5.9.130. In its D2 [REP2-035] and D7[REP7-029] updated assessments, the Applicant updated PVAs for gannet, kittiwake and GBBG using NEs 'Seabird PVA tool'. In addition, the Applicant has also undertaken an EIA scale PVA for LBBG. These models were run using a matched pairs approach, modelled over 30 years and the output metrics of counterfactual of population size and counterfactual of growth rate are presented. The Applicant [REP8-016] considered that all PVA modelling has been conducted in accordance with NE's advice on set-up and parameters and that no further PVA is required. NE [REP9-042] confirmed that the updates had been run using the 'Seabird PVA tool'.
- 5.9.131. The RSPB [REP9-052] expressed concern that the PVAs cited by the Applicant have used a Weibull mathematical function to describe the relationship between reproductive rate and population size. It was concerned that this function has 3 parameters: α , β , and $\max F$, of which none are presented by the Applicant with supporting empirical evidence. It also challenged the Applicant's argument for the use of PVA outputs incorporating compensatory density dependence as it maintains that there are no means to accurately quantify the strength and form of density dependence in a biologically meaningful way.
- 5.9.132. While the RSPB acknowledge that the phenomenon of density dependence is well established, it considers that there remains scant data to underpin the modelling of such processes, notably for seabirds, as this modelling requires detailed knowledge of demographic rates or population growth rate across a wide range of densities under otherwise comparable conditions for the species and population of interest. In response, the Applicant [REP10-033] accepts that estimating density dependence in wild populations is extremely challenging, however it

considers that this does not prevent its inclusion in PVA in order to understand how such population regulation is influenced by such factors. The Applicant continues that it has not actually relied on the results of density dependent PVA to reach conclusions of no significant impacts, but the assessment is based on the counterfactual of population growth rate from the density independent simulations. By the end of the Examination, there was no agreement between the two parties on the appropriateness of density dependent modelling within PVA.

- 5.9.133. After considering all of the evidence provided by the parties and acknowledging that NE is in agreement with the Applicant's approach, the ExA is content that PVA modelling at the EIA scale is satisfactory.

Assessment of project alone displacement impacts

- 5.9.134. There was agreement between the Applicant, NE [REP16-011] and the RSPB [REP16-014] prior to the Examination that there were no significant impacts on any bird species when assessed for the project alone, with the exception of red-throated diver (RTD) and guillemot. NE advised that for RTD there would be moderate adverse impacts when the mean estimates of abundance are combined with the upper range of impact magnitudes, and for guillemot, moderate adverse impacts are predicted when the upper 95% confidence interval estimates of abundance are combined with the upper range of impact magnitudes. The RSPB [AS-041] also expressed concern that additional mortality of RTD and guillemot could not be of negligible magnitude.
- 5.9.135. The Applicant updated its ornithology assessment at D2 [REP2-035]. It re-ran the displacement assessment using NE's advised ranges of 90-100% displacement and 1-10% mortality for RTD and 30-70% displacement and 1-10% mortality for guillemot.
- 5.9.136. Regarding RTD, the updated assessment shows that annual predicted effects for operational displacement do not exceed 1% of baseline mortality of the largest Biologically Defined Minimum Population Scale (BDMPS) for the Applicant's preferred rates of 90% displacement and 1% mortality. However, using the upper range of NE's advised rates of up to 100% displacement and 10% mortality, mortality exceeds 1% of baseline mortality of the largest BDMPS scale and the biogeographic population. The assessment equates to up to 2.64% of baseline mortality of the BDMPS using the mean abundance and up to 5.69% using the upper 95% confidence interval (CI) of abundance. Based on these figures NE [REP4-040] advise that a significant adverse impact from operational displacement from the Proposed Development alone could not be ruled out at the EIA scale for RTD.
- 5.9.137. The Applicant [REP5-051] argued that summing the seasonal predicted displacement impacts for autumn, winter and spring for RTD is precautionary, because the same birds could be affected in more than one season. The spring contribution to the overall number of RTDs at risk of displacement annually from the Proposed Development is over 77%. The annual number of RTDs predicted to die as a result of displacement from the Proposed Development's array footprint only exceeds 1% of

baseline mortality of the largest BDMPS when the displacement rate is 100% and the mortality rate is at 4% and above. For the biogeographic population, the annual number of RTDs predicted to die as a result of displacement from the Proposed Development's array footprint only exceeds 1% of baseline mortality when the displacement rate is 100% and the mortality rate is at 8% and above. Therefore, considering these outputs in the context of the specific timings of RTD peak abundance on the Norfolk Boreas site, NE could agree with the Applicant that a significant adverse impact can be ruled out for operational displacement of RTD from the Proposed Development alone.

- 5.9.138. For guillemot, the Applicant's updated assessment demonstrated that only at the worst case range of 70% displacement and 10% mortality and using the upper 95% confidence interval of abundance/density data does the predicted figure equate to just over 1% of baseline mortality of the largest BDMPS (i.e. 1.05%). NE [REP4-040] agree with the Applicant's conclusions presented in [REP2-035] that operational displacement from the Proposed Development alone would have no significant adverse impact at the EIA scale for guillemot.
- 5.9.139. The RSPB, in its SoCG with the Applicant [REP16-014] was content that no impacts of greater than minor significance are predicted for either RTD or guillemot.
- 5.9.140. The ExA is content that there is general agreement amongst the parties that the assessment of project alone displacement impacts is satisfactory.

Cumulative displacement and CRM assessments of Offshore Birds

- 5.9.141. At the commencement of the Examination, NE's overall position [RR-099] was that the EIA information is insufficient to allow a full understanding of the cumulative position with regards to:
- Gannet (displacement + collision combined)
 - Red-throated diver (displacement)
 - Kittiwake (collision)
 - Lesser black-backed gull (collision)
 - Herring gull (collision)
 - Great black-backed gull (collision)
 - Little gull (collision)
 - Razorbill (displacement)
 - Guillemot (displacement)
- 5.9.142. NE stated that for Norfolk Vanguard OWF, it was unable to rule out a significant adverse impact for cumulative operational collision impacts on gannet, kittiwake or great black-backed gull (GBBG), and the Proposed Development would add more birds to those totals.
- 5.9.143. The RSPB's initial position [RR-054] related to EIA issues was that it cannot rule out significant adverse impacts on:
- a. Cumulative collision mortality to kittiwake and GBBG; and;

- b. Cumulative operational displacement to guillemot, razorbill and red-throated diver.

Impact assessment of collision and displacement from the Proposed Development on gannet

- 5.9.144. In its RR, NE [RR-099] advised that impacts of collision and displacement for gannet should be summed for project alone and cumulatively. The Applicant considered this to be over cautious and remained concerned that different sources of precaution are being combined without proper consideration for the extremely small probability that these individually rare events could actually occur together.
- 5.9.145. The Applicant [REP2-035] provided an updated assessment of cumulative collisions for gannet which addressed NE's comments in its RR [RR-099]. Its assessment concluded that combined collision and displacement for gannet could increase the background mortality rate of the population by more than 1%, the threshold of detectability. However further assessment using PVA models found that the predicted worst-case magnitudes of cumulative impact would not result in significant impacts on the relevant populations and hence the impacts are not significant in EIA terms.
- 5.9.146. The RSPB [RR-054] accepts NE's recommended amendment to the gannet avoidance rate (AR) from 98% to 98.9% for non-breeding birds, but it does not agree that this figure should be applied to the breeding season. The RSPB prefer and recommend a more precautionary AR of 98% for the breeding season.
- 5.9.147. The Applicant responded [AS-024] that it has followed NE advice for the model parameter value and used the industry standard avoidance rates for all species. The Applicant considered that, while it is true that most observations have been made outside the breeding season, it is not aware of any evidence that suggests that these observations do not provide a robust guide to the situation at other times of year. By the end of the Examination, the RSPB [REP16-014] still maintains that an avoidance rate of 98% should be adopted.
- 5.9.148. NE's advice [REP13-038] remained that, after considering the SoS 'minded to approve' letter for Hornsea Project Three OWF, a significant adverse impact cannot be ruled out for cumulative collision plus displacement of gannet when the Proposed Development is considered cumulatively with other plans and projects at the EIA scale.
- 5.9.149. The RSPB [REP13-049] fully supports NE's position. It has seen no new evidence to justify changes to these conclusions, therefore it agrees that it is not possible to conclude that significant cumulative collision and displacement impacts can be ruled out for gannet. The RSPB confirmed its position at D15 [REP15-013] and continued that this position is also taken given the increasing level of impacts from OWFs on this species and the need to ensure that colonies are not affected in the future as a result of "*death by a thousand cuts*", as stated in NE's D13 response [REP13-038].

- 5.9.150. By the end of the Examination, NE [REP16-011] still had concerns regarding the predicted magnitude of cumulative impact and its uncertainty regarding the appropriate estimates to use for Hornsea Project Three and Hornsea Project Four OWFs. Both NE and the RSPB [REP16-014] cannot agree that there would not be a significant cumulative collision and displacement impact for gannet.
- 5.9.151. The argument about precaution continued throughout the Examination with the Applicant, NE and the RSPB making robust submissions both orally at the ISHs and through written evidence, for example submissions from NE [REP4-039], [REP4-040], [REP4-043], [REP5-077], [REP7-010], [REP7-048], [REP7-04] and [REP13-038], from the RSPB [RR-054], [REP3-028], [REP9-052] and [REP13-049] and from the Applicant [REP5-051], [REP6-021], [REP8-015], [REP10-033], [REP13-013], [REP14-039], [REP15-003] and [REP17-003].
- 5.9.152. In summary, the main arguments were around:
- a. acceptance of headroom from as-built OWFs where the number of constructed WTGs is less than those consented;
 - b. the variability and/or uncertainty in:
 - i. assessments being based on two-year survey data which does not capture the full extent of variation in density/abundance of seabirds;
 - ii. empirical evidence is scarce or lacking in many areas of the assessments;
 - iii. the potential limitations in recording of site-specific data on seabird flight heights and the inevitable reliance on generic flight height data may have the potential to lead to underestimates of potential collisions; and
 - c. over-precaution is compounded when multiple elements of individual precaution are brought together.
- 5.9.153. A detailed assessment of the approach to precaution and the ExA's conclusions are presented in Chapter 6.
- 5.9.154. After having considered all of the evidence, the ExA considers that in relation to the impact assessment of collision and displacement from the Proposed Development on gannet there could be a significant cumulative collision and displacement impact at the EIA scale.

Cumulative Collision Assessment of offshore birds

Gannet, Kittiwake and GBBG

- 5.9.155. The Applicant's assessment of CRM results for gannet, kittiwake and GBBG in ES Chapter 13 [APP-226] concluded that cumulative impact on these populations due to collisions both year round and within individual seasons is considered to be of low magnitude even for the worst case 10MW WTG, therefore no further assessment is considered necessary. In its RR, NE [RR-099] considered that there was insufficient EIA information in the ES to allow a full understanding of effects of collision

risk for gannet, kittiwake and GBBG. It noted that the assessments do not consider the CRM predictions from the Band model Option 1 outputs, only those for Option 2. NE recommend that the Applicant considers the Option 1 outputs for these species in the context of the relevant Option 2 figures for the 95% CIs of the density data, as part of a more range-based approach to consideration of CRM impacts.

- 5.9.156. The RSPB [AS-041] had concerns that the kittiwake flight speed of 13.1 m/s used in the Applicant's CRM [APP-566] was based on a single study carried out on a single OWF where not all behavioural states will have been recorded. The Applicant provided a review of kittiwake flight speed for use in CRM modelling at D5 [REP5-060] with the conclusion that it would be appropriate to use a flight speed of 10.8 m/sec with a standard deviation of 0.9 m/sec, based on the available evidence and range of different methods used to estimate kittiwake flight speed.
- 5.9.157. The RSPB [REP9-052] reviewed the updated note and did not consider that the presented evidence altered its position. It supports the position set out by NE [REP4-039] that speeds are variable, and the evidence does not support the proposed amendment by the Applicant, as it risks underestimating potential collision impacts. The RSPB's final position is set out at D15 [REP15-013] that it is not precautionary to base assessment on a speed parameter derived from a single site where not all behavioural states will have been recorded. The RSPB explains that this *"may be compromised by the presence of vessels and may not have the environmental conditions relative to the site being assessed. In this case it is best to have site specific parameters, or, in the absence of these, a range of values"*.
- 5.9.158. NE [REP7-048] recommend that as there is uncertainty in the appropriate flight speeds to use for kittiwake, the currently used value of 13.1m/s and the value from the work undertaken by the Proposed Development's consultants in [REP5-060] are used. NE notes that its suggested approach does not quantify the range of flight speeds in a statistical way, and it should not be seen as confidence intervals around a mean, as it is entirely possible that the variability could extend beyond these two values.
- 5.9.159. The Applicant [REP2-035] provided updated CRM assessments for gannet, kittiwake and GBBG which address NE's comments at D2. The Applicant concluded that potential impacts of cumulative collisions for gannet would result in a slight reduction in the current growth rates, for kittiwake a reduction in long term growth rates by no more than 0.6% and for GBBG a slight reduction in the current growth rates. The total figures quoted above include estimates for both Hornsea Project Three and Hornsea Project Four proposed OWFs. The Applicant therefore concluded that for the three species, cumulative impacts would be minor adverse significance.
- 5.9.160. At D6, the Applicant [REP6-024] responded to requests from the ExA [PD-009], NE [RR-099] and the RSPB [RR-054] to consider options for raising the draught height of WTGs (the gap between the lower rotor tip

and the sea surface at Mean High Water Spring) to mitigate potential impacts as far as possible. The Applicant has undertaken a detailed review of a range of mitigation options, also considering alternative WTG models and the capacity and availability of construction vessels. This led the Applicant to a commitment to remove smaller capacity WTGs, i.e. less than 11.55MW, from the project design envelope and to increase the draught height as far as possible within the limit imposed by the installation capacity of available construction vessels.

- 5.9.161. The maximum number of WTGs was reduced from 180 x 10MW WTGs with a draught height of 22m to either 158 x 11.55MW WTGs with a draught height of 35m or 124 x 14.7MW WTGs with a draught height of 30m. The 11.55MW WTG represents a guaranteed design option as this model is currently commercially available, while the 14.7MW WTG is expected to be available in the project's construction timeframe.
- 5.9.162. The Applicant calculated that collision risk estimates for the 14.7MW WTGs at 30m are slightly higher than those for the 11.55MW WTGs at 35m, and therefore the 14.7MW design is the worst-case scenario. In addition, consented estimates for kittiwake for Dogger Bank Creyke Beck A and B OWFs were used. The Applicant considered that these revised estimates supports its position that there would be no significant impacts for gannet, kittiwake or GBBG from cumulative collisions.
- 5.9.163. In its response [REP7-047], NE pointed out two errors in the assessments; that the kittiwake cumulative and in-combination collisions for all projects but excluding Hornsea Project Three OWF were incorrectly summed and the spring and autumn apportioning rates used to estimate the number of gannet collisions which are assigned to the Flamborough and Filey Coast Special Protection Area (6.2% and 4.8% respectively) were applied the wrong way around for the Proposed Development and Norfolk Vanguard OWF. The Applicant corrected these errors in the updated version of its assessment [REP8-025].
- 5.9.164. NE [REP7-047] commented that the revised cumulative gannet collision totals have reduced by 82 birds following the reductions in the Proposed Development and Norfolk Vanguard OWF predictions, and an increase in the figure included for Dogger Bank Creyke Beck A & B OWFs, due to the consented total now being included. Based on the Applicant's PVA metrics, consideration of future growth of the population and given the UK's particular responsibility for gannet because of supporting over half of the global population, NE consider that the predicted impacts at the North Sea population scale have the potential to give rise to significant impacts. Therefore, NE remain unable to rule out a significant adverse impact on gannet from cumulative collision mortality at an EIA scale irrespective of whether the Hornsea Project Three and Hornsea Project Four OWFs are included in the cumulative totals.
- 5.9.165. NE also noted that the Applicant's revised cumulative kittiwake collision totals have increased by 25 birds as, although there have been reductions in the Proposed Development and Norfolk Vanguard OWF predictions, there has also been an increase in the figure included for

Dogger Bank Creyke Beck A & B OWFs due to their consented totals now being included. Therefore, as the revised cumulative totals in NE's assessment update [REP8-025] have increased from those presented by the Applicant in the Applicant's update[REP2-035], NE's advice remains that, given the population declines at a UK and wider scale for the species, the predicted impacts at the North Sea population scale have the potential to give rise to significant impacts. Therefore, NE is unable to rule out a significant adverse impact on kittiwake from cumulative collision mortality at an EIA scale irrespective of whether the Hornsea Project Three and Hornsea Project Four OWFs are included in the cumulative totals or not.

- 5.9.166. The RSPB [RR-054] also challenged the Applicant's issues with the suitability of tracking data obtained as part of RSPB's FAME (Future of the Atlantic Marine Environment) and STAR (Seabird Tracking and Research) projects for use in the assessment, claiming that the Applicant's report [APP-201] contains a number of misinterpretations and erroneous assertions. The Applicant [REP3-007] pointed out that its concerns about the kittiwake tracking data were based on the experience of the Applicant's ornithological consultants and reviews of tagging effects on this and similar species. The Applicant considered that these concerns are therefore not unjustified and should be taken into account when interpreting the tracking data. The RSPB [REP9-052] has nothing further to add, but request that its position be noted fully in the RIES [PD-020]. There was no further comment on this issue during the Examination.
- 5.9.167. In relation to GBBG, NE [REP7-047] pointed out a slight error in the Applicant's revised cumulative collision totals for GBBG when Hornsea Project Four OWF is included in Table 2.5 of [REP6-024]. The combined total of 3 collisions in the breeding season and 13.6 collisions in the non-breeding seasons for Hornsea Project Four OWF should be 16.6 and not 13.6 as presented by the Applicant, meaning the cumulative total including Hornsea Projects Three and Hornsea Project Four OWFs is 1,069 birds (and not 1,065.8).
- 5.9.168. NE [REP7-047] acknowledge the reduction of 75 birds from the totals presented by the Applicant in [REP2-035], following the reductions in the Proposed Development and Norfolk Vanguard predictions, but maintained that a cumulative total of 1,069 birds exceed 1% of baseline mortality of the North Sea BDMPS scale and the biogeographic population. The Applicant predicts that the cumulative GBBG collisions could result in population growth rate reductions of up to 1.4% for the BDMPS population or 0.55% for the biogeographic population. Based on the Applicant's revised assessment and particularly that the GBBG population is stable to possibly declining and that NE is not aware of any evidence to suggest that the population is going to start increasing, NE considers [REP7-047] that the predicted impacts at the North Sea population scale have the potential to give rise to significant impacts. Therefore, NE remain unable to rule out a significant adverse impact on GBBG from cumulative collision mortality at an EIA scale irrespective of whether the

Hornsea Project Three and Hornsea Project Four OWFs are included in the cumulative totals or not.

- 5.9.169. The Applicant [REP8-016] acknowledges NE's comments on possible future population trends for gannet, kittiwake and GBBG but considers NE's approach as over-precautionary through an inconsistent comparison of more precautionary density independent model predictions against more precautionary (implied) density dependent predictions of how the populations may change in the future.
- 5.9.170. At D13, NE [REP13-038] noted "*that as the Thanet Extension was not consented the contributions of this project to the cumulative displacement totals for these species should be removed from the totals. However, whilst the appropriate figures to include for the Hornsea Project Three contribution to these totals are not yet agreed, we note that these will most likely be greater than those from Thanet Extension*". Therefore, NE consider that as the cumulative totals would most likely increase with the inclusion of Hornsea Project Three and removal of Thanet Extension from those considered at [REP7-047], its advice would remain the same; i.e. that a significant adverse impact cannot be ruled out for cumulative collision of gannet, kittiwake and GBBG when the Proposed Development is considered cumulatively with other plans and projects at the EIA scale.
- 5.9.171. At the end of the Examination, the Applicant, the RSPB and NE had not changed their position. The SoCG with RSPB [REP16-014] states that the RSPB does not agree that significant cumulative collision risk can be ruled out, due to the level of cumulative impact currently predicted for kittiwake and GBBG. The SoCG with NE [REP16-011] records that cumulative collision impacts are not agreed for gannet, kittiwake and GBBG with and without the inclusion of Hornsea Project Three OWF and Hornsea Project Four OWF.

Lesser black-backed gull (LBBG)

- 5.9.172. The Applicant's assessment of CRM results for LBBG in ES Chapter 13 [APP-226] concluded that the total annual cumulative collisions for LBBG would be 196.7 birds during the breeding season and 588.48 annually. The Applicant considered these figures to be of low magnitude even for the worst case 10MW WTG, therefore no further assessment is necessary.
- 5.9.173. NE in its RR [RR-099] was unable to reach any conclusions regarding CRM for LBBG as it considered that there was insufficient EIA information to allow for a full understanding of the position. The RSPB [RR-054] also expressed concern regarding the effects of collision mortality on the LBBG population. The Applicant provided an update to its assessment at D2 [REP2-035] in which it addressed the deficiencies identified by NE. The assessment gave cumulative total collisions including all projects as 191.2 during the breeding season and 582 annually, which reduces to 564.8 with Hornsea Project Three OWF omitted and reduces further to 562.9 with the additional omission of Hornsea Project Four OWF.

- 5.9.174. Using the largest LBBG BDMPS of 209,007 and the biogeographic population of 864,000, the Applicant calculated the background mortality for these populations using an all age class mortality rate of 0.124 to be 25,917 and 107,136 respectively. The addition of 563 to 582 LBBG to these increases the background mortality by 2.2% (BDMPS) and 0.5% (biogeographic). Thus, in relation to the biogeographic population this level of mortality would be undetectable. Using NE's PVA tool, the maximum reduction in the BDMPS population growth rate at an adult mortality of 600 using a precautionary density independent model was 0.33% (0.9967).
- 5.9.175. The Applicant considered that the LBBG population has an annual growth rate of 1.8% and therefore a maximum reduction of 0.33% is not likely to result in any significant, or detectable effects on the BDMPS population and the cumulative impact on the LBBG population, assessed against the BDMPS population is not at a level which would trigger a risk of population decline but would only result in a slight reduction in the current growth rates. Consequently, it classed the cumulative collision impact significance as minor adverse.
- 5.9.176. At D6, the Applicant [REP6-024] submitted a further update of CRM to allow for the reduction in maximum number of WTGs and increase in draught height, as described above. Using the worst case of 124 x 14.7MW WTGs with a draught height of 30m, the total annual collision predictions for LBBG were 172.9 in the breeding season and 545.5 annually. The Applicant considered that these reduced estimates supports its position that there would be no significant impacts for LBBG from cumulative collisions.
- 5.9.177. NE [REP7-047] agrees with the Applicant's conclusion of no significant adverse impact from cumulative collision to LBBG at an EIA scale if the Hornsea Project Three and Hornsea Project Four OWFs are excluded from the cumulative total. However, due to NE's significant concerns regarding the incomplete baseline surveys for the Hornsea Project Three OWF, and the associated level of uncertainty as regards the potential impacts of that project, together with the inevitable uncertainty associated with the figures for Hornsea Four from the PEIR and are subject to change, NE therefore is not in a position to advise that significant impact can be ruled out for LBBG for cumulative collision impacts when the Hornsea Project Three and Hornsea Project Four OWFs are included in the cumulative totals.
- 5.9.178. The Applicant and NE maintained their position throughout the Examination, and at D16 the SoCG [REP16-011] records that NE does not agree that significant cumulative impacts can be ruled out due to collision risk for LBBG when Hornsea Project Three and Hornsea Project Four OWFs are included.
- 5.9.179. The RSPB, in its SoCG [REP16-014], is in agreement with NE in that it does not agree that significant cumulative collision risk can be ruled out, due to the level of cumulative impact currently predicted for LBBG.

Herring gull

- 5.9.180. The Applicant's assessment of CRM results for herring gull in ES Chapter 13 [APP-226] concluded that the total annual cumulative collisions for LBBG would be 373.5 birds during the breeding season and 791 annually. The Applicant considered these figures to be of low magnitude even for the worst case 10MW WTG, therefore no further assessment is necessary.
- 5.9.181. NE [RR-099] believes that the ES does not provide the competent authority with sufficient information regarding herring gull to make a decision in relation to collision effects at the EIA scale.
- 5.9.182. The Applicant provided an update to its assessment at D2 [REP2-035] in which it addressed the deficiencies identified by NE. The assessment gave cumulative annual total collisions for herring gull including all projects as 812, which reduces to 803 with Hornsea Project Three omitted and reduces further to 801 with the additional omission of Hornsea Project Four OWF.
- 5.9.183. Using the largest herring gull BDMPS of 466,511 and the biogeographic population of 1,098,000, the Applicant calculated the background mortality for these populations using an all age class mortality rate of 0.172 to be 80,240 and 188,856 respectively. The addition of 800 to 812 herring gull to these increases the background mortality by 1% (BDMPS) and 0.4% (biogeographic). Thus, assessed against both the BDMPS and the biogeographic population this level of cumulative mortality is below the threshold of detectability and consequently, the impact on the herring gull population due to cumulative collisions is considered by the Applicant to be of low magnitude, so for this low sensitivity species the impact significance is minor adverse.
- 5.9.184. At D6, the Applicant [REP6-024] submitted a further update of CRM to allow for the reduction in maximum number of WTGs and increase in draught height, as described above. Using the worst case of 124 x 14.7MW WTGs with a draught height of 30m, the total annual collision predictions for herring gull were 384.3 in the breeding season and 795 annually. The Applicant considered that these reduced estimates supports its position that there would be no significant impacts for herring gull from cumulative collisions.
- 5.9.185. NE [REP7-047] agrees with the Applicant's conclusion of no significant adverse impact from cumulative collision to herring gull at an EIA scale if the Hornsea Project Three and Hornsea Project Four OWFs are excluded from the cumulative total. However, due to NE's significant concerns regarding the incomplete baseline surveys for the Hornsea 3 project, and the associated level of uncertainty as regards the potential impacts of that project, together with the inevitable uncertainty associated with the figures for Hornsea 4 from the PEIR which are subject to change, NE therefore is not in a position to advise that significant impact can be ruled out for herring gull for cumulative collision impacts when the Hornsea 3 and Hornsea 4 projects are included in the cumulative totals.

- 5.9.186. The Applicant and NE maintained their position throughout the Examination, and at D16 the SoCG [REP16-011] records that NE does not agree that there would not be any significant cumulative impacts due to collision risk for herring gull when Hornsea Project Three and Hornsea Project Four OWFs are included.

Little gull

- 5.9.187. The Applicant's assessment of CRM results for little gull in ES Chapter 13 [APP-226] concluded that the annual collision risk for little gull for the Proposed Development, using the worst case 10MW WTG option and Band Option 2, would be 3.88. The Applicant considered this to be of low magnitude even for the worst case 10MW WTG, therefore no further assessment is necessary.
- 5.9.188. NE [RR-099] believes that the ES does not provide the competent authority with sufficient information regarding little gull to make a decision in relation to collision effects at the EIA scale.
- 5.9.189. The Applicant provided an update to its assessment of little gull at D2 [REP2-035] in relation to HRA project alone and in-combination, which is discussed in Chapter 6. NE [REP4-040] noted that no figures have been included by the Applicant for the East Anglia One North and East Anglia Two OWFs.
- 5.9.190. At D6, the Applicant [REP6-024] submitted a further update of CRM to allow for the addition of estimates for East Anglia One North and East Anglia Two OWFs and the reduction in maximum number of WTGs and increase in draught height, as described above. Using the worst case of 124 x 14.7MW WTGs with a draught height of 30m, the total cumulative collision predictions for little gull were 61.4. The Applicant considered that this reduced estimate supports its position that there would be no significant impacts for little gull from cumulative collisions.
- 5.9.191. NE [REP7-047] advised that the cumulative collision total exceeds 1% of baseline mortality of the precautionary BDMPS estimate based on the surveys conducted across the Greater Wash Area of Search and analysis of those data in NE & JNCC (2016), as used by Applicant. However, for the larger figure estimated to be up to 75,000 for the little gull population with connectivity to the southern North Sea, the cumulative totals equate to less than 1% of baseline mortality for this population and can be considered undetectable against background mortality.
- 5.9.192. Therefore, NE [REP7-047] agrees with a conclusion of minor adverse impact from cumulative collisions to little gull at an EIA scale irrespective of whether the Hornsea 3 and Hornsea 4 OWF projects are included from the cumulative total. However, NE's decision is made on the basis that the cumulative assessment includes all appropriate and publicly available collision estimates for other OWFs only, and as a consequence its confidence in this conclusion is reduced.
- 5.9.193. The SoCG with NE [REP16-011] records that both parties agree that there would not be any significant cumulative impacts due to collision

risk for little gull irrespective of whether Hornsea Project Three and Hornsea Project Four OWFs are included.

Summary

- 5.9.194. Having considered all of the evidence presented during the Examination regarding the results of cumulative CRM of offshore birds, the ExA understands the uncertainty about the impacts from Hornsea 3 and Hornsea 4 OWF projects and that the inclusion of these projects results in significant combined effects. However, considering the SoS 'minded to approve' letter of 1 July 2020 in relation to Hornsea Project Three OWF, the ExA considers it prudent to include both projects in the assessment of cumulative effect. The ExA therefore agrees with NE and the RSPB that significant cumulative collision risk cannot be ruled out for gannet, kittiwake, GBBG, LBBG and herring gull.

Cumulative displacement impact assessment of offshore birds

Red Throated Diver (RTD)

- 5.9.195. In its ES [APP-226] the Applicant considered cumulative displacement and consequent mortality rates for RTD across a range from 90% - 100% displaced and from 1% to 10% mortality, operating within no more than 4km of the Proposed Development boundary. It concluded that the annual displacement mortality would be between 30 and 339 birds.
- 5.9.196. Considering the largest BDMPS for RTD to be 13,277 and at an average baseline mortality rate of 0.228 the Applicant calculated that the number of individuals expected to die is 3,027 annually. The addition of between 30 and 339 birds would increase the mortality rate between 0.99% and 11.2%. Using the biogeographic population for RTD of 27,000 individuals and an average baseline mortality rate of 0.228 the Applicant calculated the number of individuals expected to die to be 6,156. The addition of between 30 and 339 birds to this would increase the mortality rate between 0.49% and 5.5%. Thus, at the worst case cumulative range of 100% displaced and 10% mortality, the predicted impacts would exceed the 1% threshold below which impacts are considered to be undetectable.
- 5.9.197. NE [REP1-056] does not agree with the Applicant that all OWFs at which WTGs were installed before or during 2012 form part of the Proposed Development baseline. This is because, although some of the OWFs included in the Applicant's list have been operational for over 10 years, the RTD population data pre-date the installations. Therefore, the baseline cannot be assumed to include the effects of these OWFs. In addition, NE note that no figures have been included in the cumulative assessment for the East Anglia One North and East Anglia Two OWF projects.
- 5.9.198. In Table 13.41 of the ES Chapter [APP-226] many of the OWFs are listed as having no RTD displacement assessments or qualitative assessments with no numbers available. NE [REP1-056] recommend that a better approach would be to present the seasonal mean peak abundances and

then sum figures across the OWFs and put this through the matrix. Alternatively, NE suggested using a 'like for like' approach similar to that taken by Thanet Extension and Norfolk Vanguard OWFs which used the predicted density map and the underlying dataset of the Seabird Mapping and Sensitivity Tool (SeaMaST) as a common data source of RTD density in the North Sea. The RSPB [REP2-096] agree with the approach advocated by NE and disagree with the Applicant that NE's approach is highly precautionary.

- 5.9.199. The Applicant provided an update assessment at D2 [REP2-035] to address NE's and the RSPB's concerns, which gave a total abundance of 3237.2 birds using the SeaMaSt dataset and 4km buffer. The Applicant concluded that the update has provided further evidence that the overall impact on RTDs is mostly accounted for by operational OWFs. In addition, it notes that recent surveys have found an apparent increase in the population in the Outer Thames Estuary, or at the very least no evidence for a decline, therefore it would appear that negative effects on this species due to operational OWFs are less severe than suggested by the precautionary approach advised by NE.
- 5.9.200. While NE [REP4-042] welcomed the update using the SeaMaSt data, it considered that based on the cumulative figures presented by the Applicant the predicted figures are still significant. Therefore, it was unable to rule out a significant adverse impact on RTD from cumulative operational displacement at an EIA scale, although it does note that the Proposed Development's contribution is small at 0.1%.
- 5.9.201. The Applicant [REP5-051] considers NE's view to be highly precautionary and if a more proportionate approach to precaution is used, it could be concluded that there would be no significant cumulative impacts on RTD.
- 5.9.202. The Applicant also pointed out that during the period the operational OWFs have been installed, surveys of the region have reported that the population of RTD has trebled in size from around 6,000 individuals to over 18,000. NE [REP7-045] notes that this apparent increase may be linked to changes in survey platform, i.e. from aerial visual to aerial digital surveys. NE acknowledges that there is an underestimate from visual aerial methods, linked to disturbance of RTDs. It also considers it likely that at high RTD densities, detection rates are higher for digital aerial surveys than from aerial visual surveys. As there is no preconstruction baseline corrected for the underestimates of visual aerial surveys, NE cannot determine whether there has been an increase in RTD numbers. However, it certainly knows that there is displacement of RTDs from OWFs as the digital aerial surveys of the Outer Thames Estuary SPA demonstrate gaps in RTD distribution where OWFs are located.
- 5.9.203. The Applicant [REP8-016] agrees that RTD are displaced by OWFs and as it has suggested a similar rate for displacement to NE it does not consider this aspect of the assessment to constitute more than a very minor disagreement. However, the Applicant and NE do disagree on the consequence of displaced birds. The Applicant considers that mortality of

displaced birds is likely to be very low, at no more than 1%, while NE consider this to potentially be up to 10%. In this context, the population size in the southern North Sea and the apparent trend in this population since 2006 is very relevant.

- 5.9.204. The RSPB [REP13-049] considers that the Applicant has not demonstrated that there are currently no significant cumulative displacement impacts affecting the Southern North Sea population of RTD. While the scale of development in the Southern North Sea is extensive and there is clear evidence of the existence of displacement impacts, there remains considerable uncertainty as to how these impacts would manifest on the population dynamics. The RSPB states that the approach adopted by the Applicant risks under-estimating impacts and fails to apply the precautionary principle given the high degree of uncertainty associated with the population scale impacts from the predicted level of cumulative displacement on this species.
- 5.9.205. By the end of the Examination, NE [REP13-038] in response to a R17 request [PD-021] noted that the 'like for like' cumulative RTD assessment undertaken by the Applicant using the SeaMaST dataset did not include Hornsea Project Three and Hornsea Project Four as the SeaMaST data did not yield density estimates for these projects. Therefore, NE maintain that the cumulative assessment for RTD is not subject to consideration of the most appropriate figures to include for Hornsea Project Three or to the uncertainty associated with the Hornsea Project Four OWF figures coming from the PEIR for the project. As a result, its advice remains that a significant adverse impact cannot be ruled out for cumulative displacement for RTD irrespective of inclusion of Hornsea Project Three or Hornsea Project Four.
- 5.9.206. The Applicant [REP14-039] stated that as NE's positions has remained unchanged no further comment is considered necessary from the Applicant. Both NE and the RSPB do not agree with the Applicant that impacts from operational displacement would be no greater than minor significance, as recorded in the SoCG with NE [REP16-011] and the RSPB [REP16-014].
- 5.9.207. The ExA has considered all of the evidence available for cumulative displacement for RTD at the EIA level and the final positions of the Applicant, NE and the RSPB. It has concluded that it cannot rule out significant adverse effects from operational displacement.

Razorbill and Guillemot

- 5.9.208. In its RR, NE [RR-099] raised a number of concerns regarding razorbill and guillemot cumulative operational displacement assessments made by the Applicant. These concerns included the omission of a number of OWFs and advice on the use of displacement matrices for the Thanet Extension and Hornsea Project Three OWFs. NE therefore advised the Applicant to update the cumulative assessments, as it was unable to make any conclusions regarding the level of cumulative operational displacement impact on razorbill or guillemot. The RSPB [AS-041] also

expressed concern with the extent of displacement for the two species, and a lack of evidence.

- 5.9.209. The Applicant provided updated assessments at D2 [REP2-035] which allowed for the missing OWFs and assessment of total cumulative values with and without the inclusion of Hornsea Project Three and Hornsea Project Four, as requested by NE. However, the Applicant questioned the methods requested by NE, as it considered them over precautionary. The Applicant questioned the basis for the requirement to consider displacement of up to 70% when it considers the evidence indicates that this is more likely to be less than 50%, extending up to 2 km from the OWF when the evidence indicates that this should be no more than 1 km and resulting in up to 10% mortality for auks when the evidence indicates that 1% is a more realistic and still precautionary value.
- 5.9.210. The cumulative total annual mortality for razorbill across all UK North Sea and Channel OWFs was estimated by the Applicant to be in the range of 401 to 9,355, across a range of displacement of 30% to 70% and mortality of 1% to 10%. Assessed against the largest BDMPS of 591,874, with a baseline mortality rate of 0.174, using NE's approach of 70% displaced and 10% mortality, would increase the mortality rate by 9.1%, while assessed against the biogeographic population of 1,707,000 this would result in an increase in mortality of 3.1%.
- 5.9.211. However, using the Applicant's evidence-based rates of 50% displaced and 1% mortality, the predicted annual mortality of 668 would increase the mortality rate for the BDMPS population by 0.65% and for the biogeographic population the increase would be 0.22%. These increases are below the threshold of detectability and therefore the magnitude of effect is assessed as negligible. As the species is of medium sensitivity to disturbance, the impact significance is minor adverse.
- 5.9.212. Similarly, for guillemot, the cumulative total annual mortality across all UK North Sea and Channel OWFs was estimated by the Applicant to be in the range of 1,286 to 30,017, across a range of displacement of 30% to 70% and mortality of 1% to 10%. Assessed against the largest BDMPS of 2,045,078, with a baseline mortality rate of 0.14, using NE's approach of 70% displaced and 10% mortality, would increase the mortality rate by 10.5%, while assessed against the biogeographic population of 4,125,000 this would result in an increase in mortality of 5.2%.
- 5.9.213. Again, using the Applicant's evidence-based rates of 50% displaced and 1% mortality, the predicted annual mortality of 2,144 would increase the mortality rate for the BDMPS population by 0.75% and for the biogeographic population the increase would be 0.37%. These increases are below the threshold of detectability and therefore the magnitude of effect is assessed as negligible. As the species is of medium sensitivity to disturbance, the impact significance is minor adverse.
- 5.9.214. Discussions between the Applicant, NE and the RSPB over the evidence base for the extent of displacement and level of precaution continued throughout the Examination, without any agreement. At D8, the

Applicant's position [REP8-016] was that the displacement (70%) and mortality rates (up to 10%) applied by NE are over precautionary and disagrees with the conclusions that NE has reached on the cumulative assessment for guillemot and razorbill. The Applicant considers the evidence-based rates of 50% and 1% are appropriate and that cumulative displacement would not result in a significant impact on either guillemot or razorbill.

5.9.215. NE's final position given in the SoCG [REP16-011], is that significant cumulative displacement impacts cannot be ruled out for razorbill and guillemot. This position is also that of the RSPB [REP16-014].

5.9.216. The ExA remains concerned that it does not have the evidence to conclude that at the EIA level, it cannot rule out significant adverse effects from operational displacement for razorbill and guillemot.

Confirmation of the end of construction

5.9.217. In its RR, NE [RR-099] request that a requirement be added to the dDCO for the Applicant to confirm in writing to the MMO and Relevant Local Planning Authorities once the construction phase has ended and the operations and maintenance phase has commenced. At [REP3-021], NE noted that DML Condition 9 of Schedule 9-10, Condition 4 of Schedule 11-12 and Condition 3 of Schedule 13 in the dDCO [REP18-009] meets a requirement to notify the MMO. NE considered that confirmation was needed that after this date no works considered to be construction could take place. The MMO [REP6-045] requests clarity from the Applicant on what the Applicant classes as "*completed construction*" as parties could have a different view of when construction was completed.

5.9.218. Discussions between the Applicant, NE, the MMO and the ExA continued throughout the Examination. By the end of the Examination, the MMO [REP9-034] agreed that no changes to the dDCO were required.

Timeframe for approval of plans and documents

5.9.219. In its RR, the MMO [RR-069] considered that the Applicant's requirement that each programme, statement, plan, protocol or scheme required to be approved under Condition 14 of the DMLs in the dDCO must be submitted for approval at least four months prior to the intended commencement of licensed activities did not allow for sufficient time to fully assess and review documents. Both the MMO and NE [RR-099] considered that six months was an acceptable period.

5.9.220. By the close of the Examination, discussions between the parties [REP16-009, REP16-010] resulted in agreement that only certain documents (the HHW SAC control document, the SNS SIP and the MMMP) require six months for approval and that the rest of the documents can remain at four months. The relevant changes were made to Schedules 9 and 10 Condition 14(1)(b) and Condition 15(3), Schedules 11 and 12 Condition 9(1)(b) and Condition 10(3), Schedule 13 Condition 7(1)(b) and Condition 8 (3) of the dDCO [REP18-009].

Conclusions

- 5.9.221. The ExA has carefully considered the issues discussed above in accordance with NPS EN-1 and EN-3 together with other relevant legislation and policies and has arrived at the following conclusions.

The useability of the ES at the end of Examination

- 5.9.222. With reference to the useability of the ES post-Examination for monitoring and enforcement, the ExA agrees with the regulators that during the Examination a number of clarification documents, additional modelling and addendums have been submitted. These are not easily located alongside the ES and the ExA accepts that it can be extremely challenging to locate the relevant documents post-consent in order to achieve clarity as to what had been consented.
- 5.9.223. However, the ExA agrees with the Applicant that the ES is a record of what has been assessed at the time of preparation and that it should not be updated. The ExA is content with the compromise that Schedule 18 of the rDCO should clearly identify the final documents containing the parameters to be used for monitoring and enforcement.

Benthic monitoring

- 5.9.224. Turning to the MMO's concern that the OIPMP only proposes monitoring of *S. spinulosa* reef and not wider benthic impacts, the ExA is content that the OIPMP would provide an appropriate framework to agree monitoring requirements, if the Order was made, between the Applicant and the MMO. The MMO and its Scientific Advisors recognise that the updated text in the OIPMP allows for the scope of the benthic surveys to be increased post consent if there is good justification to do so.

The effects of cable protection on benthic ecology

- 5.9.225. Regarding the impact that cable protection could have on sandbanks, the ExA accepts that the Applicant has made every effort to reduce the amount of cable protection and that the 5% secured is a contingency in the event that unsuitable ground conditions were encountered. However, as detailed in Chapter 6, due to the uncertainties related to sandbank modelling and changes to sediment composition arising from the disposal of dredged material there remains doubt within the ExA over whether the sandbanks would fully recover following cable installation.
- 5.9.226. Considering the MMO's concerns that new cable protection works could be considered by the Applicant to be licenced for deployment at any time during operation, the ExA is content that cable protection as described in the rDCO and associated plans may only be deployed during construction and that any new cable protection required during operation would need to be the subject of a separate licence application.
- 5.9.227. Therefore, the ExA concludes that the doubts about recovery of the sandbank leads to its conclusion that there could be significant adverse effects from cable protection on benthic ecology.

The capacity to microsite offshore cable to avoid impacts on reef features

- 5.9.228. Throughout the Examination, while the Applicant considered that it could avoid all reef features by micro-siting, NE maintained that there remains a risk that the extent of *S. spinulosa* reef at the time of construction may be such that micro-siting is not possible.
- 5.9.229. As explained in Chapter 6, the ExA is concerned that there is insufficient scientific evidence to understand the impact of disruption to reef features and their ability to recover. It has carefully considered the advice given by NE, as the Government's statutory advisors, and the fact that the Applicant accepts that scientific certainty is not possible to obtain. The ExA therefore concludes that micro-siting of cables may not be possible through areas of reef and micro-siting does not preclude the loss of *S. spinulosa*.

Monitoring changes in seabed topography, including sand wave levelling

- 5.9.230. There was concern expressed during the Examination by both NE and the MMO regarding the impact of sand wave levelling and the ability of sand wave crests to reform. Both parties advised that any sand wave levelling, must have detailed monitoring before and after the activity, with method and frequency to be agreed with NE in order to monitor the impact and recovery.
- 5.9.231. After careful consideration of the evidence and position of all parties, the ExA concludes that monitoring of changes in seabed topography, including sand wave levelling, is adequately secured through the IPMP. However, the ExA also accepts NE's advice that there remain uncertainties such that it is unable to advise, beyond all reasonable scientific doubt, that there would be no adverse effects on seabed topography, including sand waves, from installation of cables.

Control of particle size during sediment disposal

- 5.9.232. There were concerns throughout the Examination regarding the Applicant's plans for disposing of sediments arising from construction operations. These concerns included the need for seabed material from cable installation to remain within the benthic system and that the dredge material should be similar in particle size to that at disposal locations.
- 5.9.233. The ExA is content that all sediments would be disposed of within the benthic system and that the overall area of sandbank habitat would not change. The ExA understands NE's concerns that there would be changes to sediment composition and its advice that dredged material should be more than 95% similar in particle size to material present at disposal locations. However, the ExA also accepts the Applicant's view that sampling all dredged sediment and areas within the disposal site in order to determine 95% similarity is unfeasible. The ExA is also aware that NE is uncertain regarding the feasibility of how the Applicant could achieve this.

- 5.9.234. After considering the evidence, the ExA is content that control of particle size during sediment disposal is adequately secured in the rDCO and the MMO has surety of involvement in the final controls within the PEMP.

Sandeel

- 5.9.235. The main concerns expressed by the MMO regarding sandeel were a lack of data over a wider scale and therefore mainly relate to cumulative effects resulting from disturbance to habitat and temporary and permanent loss of habitat.
- 5.9.236. During the Examination, MMO and the Applicant agreed that the lack of detailed information on the spatial distribution and abundance of sandeels at a North Sea wide scale makes the assessment of cumulative effects difficult, but that the potential contribution of the project to any cumulative impact would be very small. The ExA is content with this conclusion, and with the addition to the IPMP of a commitment that, if at the time of completion of the final detailed plans there was good justification for increasing the scope of the benthic surveys this would be agreed with the MMO and included within the final plans. Data from the scope increase, to include sediment sampling, would be used to better understand any changes in habitat suitability for sandeels.

Effects of underwater noise on marine mammals

- 5.9.237. With reference to the assessment of noise from piling activities on marine mammals, the ExA concludes that the Applicant has used an appropriate methodology to assess the impacts of noise on harbour porpoises. The ExA is content that mitigation for the effects of piling in relation to permanent auditory injury is secured within the rDCO. Considering the cumulative effects of noise on marine mammals, the ExA understands NE, WDC and TWT's concerns about the lack of a mechanism to manage cumulative construction effects from OWFs in the North Sea. However, the ExA notes that the MMO does not share these concerns. The ExA has no reason to believe that by the time piling activities for the Proposed Development commence in the South North Sea the activity tracker would not be fully operational and useful for strategically controlling noise activities to protect marine mammals.
- 5.9.238. After consideration of the evidence and position of all parties, the uncertainties around the effects of noise on Cetaceans, and the discussion in Chapter 6 in relation to HRA, the ExA concludes that there would be no adverse effects from underwater noise as a result of the Proposed Development alone or cumulatively with other plans or projects.

Population viability analysis for offshore birds

- 5.9.239. Regarding population modelling of sea birds, the ExA is content with the Applicant's updated PVAs for gannet, kittiwake and GBBG using NE's 'Seabird PVA tool' and that it has also undertaken an EIA scale PVA for LBBG. These models have been conducted in accordance with NE's advice and NE has confirmed its acceptance.

- 5.9.240. The ExA has also considered the RSPB's concerns about the Applicant's use of a Weibull mathematical function to describe the relationship between reproductive rate and population size and the use of PVA outputs incorporating compensatory density. The ExA accepts the Applicant's explanation that it has not relied on the results of density dependent PVA to reach conclusions of no significant impacts, but assessments are based on the counterfactual of population growth rate from the density independent simulations. While there was no agreement between the two parties on the appropriateness of density dependent modelling within PVA, the ExA is content that PVA modelling at the EIA scale is satisfactory.

Impact assessment of collision and displacement from the Proposed Development on gannet

- 5.9.241. The issue raised by the RSPB was over the avoidance rates (AR) used for breeding and non-breeding birds. It accepted NE's recommended rate of 98.9% for non-breeding birds, but it preferred a more precautionary AR of 98% for the breeding season. The ExA considers that there is robust evidence to support NE's recommended rate of 98.9% for both breeding and non-breeding birds.

- 5.9.242. NE's major concern was the uncertainty in the figures included for the cumulative totals for Hornsea Project Three and Hornsea Project Four OWFs. NE's advice remained that, after considering the SoS 'minded to approve' letter for Hornsea Project Three OWF, a significant adverse impact cannot be ruled out for cumulative collision plus displacement of gannet when the Proposed Development is considered cumulatively with other plans and projects at the EIA scale. The ExA is in agreement with this advice and considers significant adverse effect cannot be ruled out.

Cumulative collision assessment of offshore birds

- 5.9.243. Having considered all the evidence presented during the Examination regarding the results of cumulative CRM of offshore birds, the ExA understands the uncertainty about the impacts from Hornsea Project Three and Hornsea Project Four OWF projects and that the inclusion of these projects would result in significant combined effects. However, considering the SoS's 'minded to approve' letter of 1 July 2020 in relation to Hornsea Project Three OWF, the ExA considers it prudent to include both projects in the assessment of cumulative effect. The ExA therefore agrees with NE and the RSPB that significant cumulative collision risk cannot be ruled out for gannet, kittiwake, GBBG, LBBG and herring gull.

- 5.9.244. The ExA is also content that there would not be any significant cumulative impacts due to collision risk for little gull irrespective of whether Hornsea Project Three and Hornsea Project Four OWFs were included.

Cumulative displacement impact assessment of offshore birds

- 5.9.245. For RTD, the ExA shares NE's concern that the cumulative assessment for RTD does not include the most appropriate figures for Hornsea Project

Three or to the uncertainty associated with the Hornsea Project Four OWFs. As a result, the ExA concludes that a significant adverse impact cannot be ruled out for cumulative displacement for RTD irrespective of inclusion of Hornsea Project Three or Hornsea Project Four.

5.9.246. The disagreement between the Applicant and NE regarding razorbill and guillemot centred on the displacement and mortality rates used for assessment. The ExA has considered the evidence and does not agree that displacement of 70% and mortality rate of up to 10% applied by NE are over precautionary considering NE's significant concerns regarding the incomplete baseline surveys for Hornsea Project Three and Hornsea Project Four OWFs.

5.9.247. Having considered all of the evidence, and for the reasons given above for cumulative displacement, the ExA concludes that it cannot rule out significant adverse effects from operational displacement at the EIA scale for RTD, razorbill and guillemot.

Confirmation of the end of construction

5.9.248. The ExA is content that no changes to the rDCO are required in relation to the relationship between the end of the construction phase and the commencement of the operation and maintenance phase of the Proposed Development.

Timeframe for approval of plans and documents

5.9.249. The ExA is content that agreement has been reached by all parties that the HHW SAC control document, the SNS SIP and the MMMP require six months for approval and that the rest of the documents would be approved in four months. This is secured in the rDCO.

Policy tests

5.9.250. With reference to the NPS EN-3 policy tests for offshore ecology which addresses the specific considerations which apply to offshore wind energy the ExA concludes that:

- a. the specific effects on fish, seabed habitats, marine mammals and birds – tests have not been passed;
- b. noise mitigation that would reasonably minimise significant disturbance to marine mammals – test has been passed;
- c. while a bird collision risk assessment has been conducted to a satisfactory standard having had regard to the advice from the relevant statutory advisor, the results of the assessment do not pass the test;
- d. mitigation for subtidal habitat impact through micro-siting, cable burial and limited use of anti-fouling paints does not pass the test; and
- e. marine water quality effects from the disturbance of seabed sediments or the release of contaminants have been considered.

5.9.251. The ExA is content that the NPS EN-3 requirements for the Applicant to undertake ecological monitoring during the construction and operational

phases and utilise the results to mitigate impacts and to inform future projects, and to confirm whether any organisation has granted or refused or intends to grant or refuse, any relevant licences, including protected species mitigation licences have been complied with.

- 5.9.252. The ExA concludes that significant weight against the Order being made should be given for marine biodiversity, biological environment and ecology due to the adverse effects on:
- a. benthic ecology;
 - b. the capacity to microsite offshore cable to avoid impacts on reef features;
 - c. monitoring changes in seabed topography, including sand wave levelling;
 - d. impact assessment of collision and displacement from the Proposed Development on gannet;
 - e. cumulative collision assessment for gannet, kittiwake, GBBG, LBBG and herring gull; and
 - f. cumulative displacement impact assessment for red throated diver, razorbill and guillemot.

Draft DCO and schedule of mitigation

- 5.9.253. The conclusions above are based on the effects after the draft DCO and schedule of mitigations are taken into account.
- 5.9.254. The ExA has deleted the HHW SAC SIP in favour of the HHW SAC CSIMP in Part 1 Preliminary 2 (1); Schedules 11 and 12 Part 1: 1 (1); Schedules 11 & 12 Condition 9(1)(g) and Condition 9 (1) (m).
- 5.9.255. The Applicant's commitment to reduce the number of WTGs is secured in Schedule 1 Part 1: Work No. 1 (a); Part 3: Requirement 3 (1); Schedules 9 and 10 Part 3: para 2(1)(a); and Part 4: Condition 8(1)(b).
- 5.9.256. The Applicant's commitment to increase the spacing of WTGs is secured in Schedule 1 Part 3: Requirement 2 (1) (d); and Schedules 9 and 10 Part 4 Condition 1 (1) (d).
- 5.9.257. The Applicant's commitment to increase the draught height is secured in Schedule 1 Part 3: Requirement 2(1)(e); Schedules 9 and 10, Part 4: Condition 1(1)(e).
- 5.9.258. The revised removal and disposal volumes of inert seabed material is secured in Schedule 1 Part 1, Further Associated Development (c); Schedules 9 and 10 Part 3: paras (1)(d) and 2(2)(c) and Schedule Part 4 Condition 8(1)(h).
- 5.9.259. The reduction in total cable protection volume is secured in Schedule 1 Part 3: Requirements 5(2) and 5(4); Schedules 9 and 10 Part 4: Condition 3; Schedules 11, 12 and 13 Part 4: Condition 2

- 5.9.260. The reduction in total cable protection area is secured in Schedule 1 Part 3: Requirement 5 (3) and 5(4); Schedules 9 and 10 Part 4: Condition 3; Schedules 11, 12 and 13 Part 4: Condition 2.
- 5.9.261. A new Condition 3(1)(g) is added to Schedules 11 and 12 Part 4 to prohibit the use of rock or gravel dumping for cable protection within the HHW SAC.
- 5.9.262. The amended scour protection area and volume is secured in Schedule 1 Part 3: Requirement 11; Schedules 9 and 10 Part 4: Condition 8(1)(g); and Schedules 11 and 12 Part 4: Condition 3(1)(b).
- 5.9.263. Schedules 9 and 10 Part 4: Condition 14(1)(f); and Schedules 11 and 12 Part 4: Condition 9(1)(f) are amended to increase time for submission of the MMMP to six months.
- 5.9.264. Schedules 9 and 10 Part 4: Condition 14(1)(l) is rewritten to secure the timing for submission and detail contained in an ornithological monitoring plan.
- 5.9.265. The clarification of maximum hammer energy limits is secured in Schedules 9 and 10 Part 4: Condition 14(3); and Schedules 11 and 12 Condition 9(3).
- 5.9.266. A cable specification installation and monitoring plan for cables outside of the HHW SAC s secured in Schedules 11 and 12 Part 4: Condition 9(1)(g).
- 5.9.267. The MMO has been added to those receiving bathymetric survey data in Schedules 9 and 10 Part 4: Condition 16; Schedules 11 and 12 Part 4: Condition 11; and Schedule 13 Part 4: Condition 9.
- 5.9.268. An additional subclause on pre-construction marine mammal monitoring is inserted in Schedules 9 and 10 Part 4: Condition 18(2)(d); and Schedules 11 and 12 Part 4: Condition 13(2)(c).
- 5.9.269. An additional subclause on post-construction marine mammal monitoring is inserted in Schedules 9 and 10 Part 4: Condition 20(2)(e); and Schedules 11 & 12 Condition 15(2)(c).
- 5.9.270. An additional Condition 19 is added to secure seasonal restrictions on cable installation construction in Schedules 11 & 12 Part 4.

5.10. MARINE AND COASTAL PROCESSES

Background and policy context

Introduction

- 5.10.1. This section sets out the effects that the Proposed Development would have on marine and coastal processes.

- 5.10.2. Marine and coastal processes were identified in the ExA's initial assessment of principal issues, as reported in Chapter 4 of this Recommendation Report. The principal issues included coastal erosion effects. This and other issues raised during the Examination, are reported below.
- 5.10.3. Marine processes, including the effects of physical processes related to cable protection on sandbanks, sand waves and *Sabellaria spinulosa* reef are examined in detail in Section 5.9 of this Recommendation Report, and in relation to HHW SAC in Chapter 6 of this Recommendation Report. Effects related to marine and intertidal archaeology are discussed in Section 5.18 of this of this Recommendation Report.

National Policy Statements

- 5.10.4. NPS EN-1 requires that the SoS should be satisfied that proposed development will be resilient to coastal erosion and deposition, taking account of climate change, during its operational life and any decommissioning period (NPS EN-1 para 5.5.10).
- 5.10.5. The SoS should examine the broader context of coastal protection around the Proposed Development, and the influence in both directions, i.e. coast on site, and site on coast (NPS EN-1 para 5.5.13).
- 5.10.6. NPS EN-1 also requires the SoS to "*consult the MMO on projects which could impact on coastal change, since the MMO may also be involved in considering other projects which may have related coastal impacts*" (NPS EN-1 para 5.5.14).
- 5.10.7. In addition to this NPS the SoS must have regard to the appropriate marine policy documents, as provided for in the Marine and Coastal Access Act 2009. The Decision Maker may also have regard to any relevant Shoreline Management Plan (SMP) (NPS EN-1 5.5.15).
- 5.10.8. NPS EN-3 states that an assessment of the effects of installing cables across the intertidal zone should include information about any alternative landfall sites and any alternative cable installation methods that have been considered by the applicant during the design phase and an explanation for the final choices made (NPS EN-3 para 2.6.81).
- 5.10.9. NPS EN-3 also considers that the construction, operation and decommissioning of offshore energy infrastructure can affect the following elements of the physical offshore environment: water quality, waves and tides, scour effect, sediment transport and suspended solids (NPS EN-3 para 2.6.189). Offshore water quality considerations are covered in Section 5.9 of this Recommendation Report.

The application

Environmental Statement

- 5.10.10. The Applicant's identification of landfall location and assessment of impacts on coastal processes is set out in ES Chapter 4 Site Selection

and Assessment of Alternatives [APP-217], Appendix 4.5 Norfolk Vanguard and Norfolk Boreas Coastal Erosion Study [APP-541], Appendix 4.6 HDD Feasibility Reports for Happisburgh and Bacton Green Landfall Sites [APP-542] and Chapter 8 Marine Geology, Oceanography and Physical Processes [APP-221].

- 5.10.11. The primary impact in relation to coastal processes was the choice of landfall location. The feasibility review considered locations for both the Norfolk Vanguard OWF and the Proposed Development. The Applicant was able to refine the search area down from five potentially feasible locations to three after reviewing environmental considerations and informal consultation. The three locations were Bacton Green, Walcott Gap and Happisburgh South [APP-217].
- 5.10.12. The Coastal Erosion Study [APP-541] concluded that there was significant uncertainty regarding the erosion dynamics on this stretch of coastline, in particular in relation to the sandscaping scheme proposed for the Bacton Gas Terminal. The site to the south of Happisburgh Village was considered to be least affected by the potential changes in sedimentation. However, the report noted that the Happisburgh South site was subject to natural erosion which would need to be considered as part of the engineering design if this site was taken forward.
- 5.10.13. The Applicant selected Happisburgh South as the preferred location because it:
- a. avoids the nationally designated Cromer Shoal Chalk Beds Marine Conservation Zone;
 - b. allows co-location of landfall for the Norfolk Vanguard OWF and the Proposed Development which reduces total amount of area directly impacted;
 - c. avoids populated areas as far as possible;
 - d. avoids areas at risk of flooding as far as possible;
 - e. provides opportunities associated with Happisburgh archaeology; and
 - f. avoids technical engineering and feasibility risks associated with locating infrastructure in the brownfield site within the Bacton Gas Terminal land. [APP-217].
- 5.10.14. An appraisal of baseline coastal processes at the landfall location and a summary of the SMP, which requires managed realignment over the next 100 years, is provided by the Applicant in ES Chapter 8 [APP-221]
- 5.10.15. The landfall site lies in an area fronted by unprotected cliffs which are eroding. The Applicant's proposed HDD drilling compound and transition pit would be located in an agricultural field and suitably set back from the cliff edge to ensure natural coastal erosion, including the impacts from climate change, should not affect the drilled cable or transition pits within the conceivable lifetime of the project.
- 5.10.16. The Applicant confirmed [REP1-041] that the landfall works would be the same for both Scenario 1 and Scenario 2.

- 5.10.17. The main issues considered during the Examination included:
- a. Coastal erosion in the vicinity of the landfall; and
 - b. Choice of landfall technique.
- 5.10.18. The ExA examined these issues with reference to the appropriate legislation and policies described in Chapter 3, through written questions (WQs), and in ISHs on Wednesday 13 November 2019 [EV3-003 and EV3-004] and Tuesday 21 January 2020 [EV6-002 to EV6-005].
- 5.10.19. The Applicant [APP-221] proposed as embedded mitigation the use of a long HDD technique at landfall which would be set well back from the cliff line and exit approximately 700m from the shore, thus passing well below the cliff and minimising any physical impacts [APP-217]. The long HDD option would also require no works on the beach or construction vehicle access to the foreshore. This would remove impacts to the intertidal area including those on archaeology, recreation, intertidal ecology and physical processes. There would be no restrictions or closures to the beach and public access would be maintained throughout construction.

Local Impact Reports

- 5.10.20. Local Impact Reports were submitted at D2 by NNDC [REP2-087] and NCC [REP2-085].

North Norfolk District Council

- 5.10.21. NNDC welcome and support the principle of renewable energy development to help meet the challenges of climate change and support the development of stronger and resilient electricity networks capable of reducing reliance on fossil fuels and to reduce the need to import electricity from outside of UK waters.
- 5.10.22. NNDC welcome the Applicant's commitment to the use of HVDC transmission and the commitment to bring cables on shore via the 'long' HDD option, which it believes are all factors which have helped to reduce the potential adverse effects of the Proposed Development. The key issue for NNDC is ensuring that the landfall location remains resilient from the effects of coastal erosion for its anticipated lifetime.
- 5.10.23. NNDC state that during the Norfolk Vanguard OWF examination, discussions focussed on the rate of coastal erosion at Happisburgh, which it claimed is renowned for its high rate of coastal change resulting from, inter alia, coastal events such as high tides and storm surges. Both parties agreed that it would be appropriate to include a requirement to monitor the landfall site within the Norfolk Vanguard DCO. As a result, the scope of Requirement 17 (R17) of the dDCO [REP10-004] relating to a Landfall Method Statement (LaMS) was extended to include a monitoring requirement and remedial works if the rate and extent of landfall erosion was to extend beyond that predicted by the applicant. NNDC noted that this requirement is included with the Norfolk Boreas dDCO and that this approach is supported by NNDC.

Norfolk County Council

- 5.10.24. The principle of the Proposed Development is supported by NCC as it is consistent with national renewable energy targets and objectives, subject to detailed comments within the LIR being satisfactorily resolved with the Applicant.
- 5.10.25. While the LIR does not comment on the landfall, the accompanying Covering Report does include the concerns of the local member for North Walsham East about cliff erosion at the landfall site, these concerns remain.

Issues

Coastal erosion

- 5.10.26. The main coastal process issue discussed during the Examination was the ongoing and significant coastal erosion at the proposed landfall [RR-036, RR-037, RR-039, RR-048, RR-053, RR-101, RR-107 and RR-108]. Coastal erosion was identified by NNDC as one of the key concerns associated with the Proposed Development [RR-101], which included concerns regarding the landfall methodology and ways to reduce the potential for coastal erosion.
- 5.10.27. Concerns relating to this issue was expressed throughout the Examination by Happisburgh PC. Happisburgh PC [RR-048] has the same concerns with the Proposed Development as it has with Norfolk Vanguard OWF, that landfall is proposed on a coast that is internationally known to be suffering from major erosion. Happisburgh PC consider that the HDD technology could have the potential to 'blow out' which could have a catastrophic and detrimental effect on the cliff area.
- 5.10.28. As stated above, the Applicant provided a Coastal Erosion Study [APP-541] and its reasoning for choosing Happisburgh South [APP-217] as the landfall location. Happisburgh PC [REP1-045] queried the small number of boreholes on the cliff top, with none on the beach or foreshore. The Applicant responded by referring to the ground investigation report submitted at D2 [REP2-019].
- 5.10.29. NCC [RR-037] and other IPs queried whether there was a need for a requirement in the dDCO for sea defences around cabling at landfall to alleviate concerns related to cliff erosion at Happisburgh. The Applicant responded [REP1-041] that following stakeholder feedback, working on the beach had been specifically excluded, resulting in the commitment to undertake a long HDD method.
- 5.10.30. ES Chapter 8 provides a description of the long HDD and highlights that its burial at sufficient depth below the coastal shore platform and cliff base would ensure that its operation would have no effect on coastal erosion [APP-221, Section 8.7.4.1]. Erosion would continue as a natural phenomenon driven by waves and subaerial processes, which would not be affected by the Proposed Development. The creation of any sea defences is, therefore, deemed by the Applicant not to be required.

- 5.10.31. In response to the ExA's WQ3, the Applicant [REP7-017] stated that the design of the cable landfall provides for the Transition Joint Bays to be set back from the beach and cliff-line at a minimum of 125m, with flexibility to set back up to 325m, sufficient to accommodate not only the most up to date information and forecasts of coastal erosion but also beyond. The final set back would be informed by predictive models of coastal processes, together with data from periodic surveys of the coastline at the landfall location.
- 5.10.32. Referring to the SMP, the Applicant [APP-221] states that the works would not affect the SMP as allowance has been made for predicted erosion rates during the project design. Also, the project is compatible with the SMP as there would be no impact on existing or planned coastal defences.
- 5.10.33. A construction method statement, including cable landfall, must be agreed with the MMO prior to construction, as required under the Deemed Marine Licence (DML) Schedules 11 and 12 Part 4 Condition 9(c)(iv). There was no comment from MMO on this point during the Examination. NE, in its SoCG [REP16-010] confirmed that it was satisfied that the specific issues relating to the assessment of coastal erosion at Happisburgh had been resolved.

Choice of landfall technique

- 5.10.34. Happisburgh PC [REP1-045] consider that HDD technology is not the correct technology for this location, as there could be the potential for a blow-out which could have a catastrophic and detrimental effect on the cliff area. It suggested alternative solutions including Direct Pipe or micro tunnelling. The Applicant provided a detailed note covering this topic at D2, Clarification Note Landfall [REP2-029], which included a description of a number of potential construction methods at landfall including Horizontal Directional Drilling (HDD) and Direct Pipe/micro tunnelling. The Applicant's position is that HDD is a proven construction method, however alternative methods such as Direct Pipe are not precluded as they fit within the design envelope and the dDCO wording.
- 5.10.35. In response to concerns regarding mud breakout, the Applicant explained [REP4-013] that mud breakout could occur on any of the proposed tunnelling methods, as drilling mud is required to lubricate the drilling head and suspend the cuttings. Requirements and risks associated with mud breakout differ between techniques and have to be considered in detail. Prevention and mitigation measures with respect to directional drilling are included in the Applicant's trenchless crossing Clarification Note [REP1-039].
- 5.10.36. The Applicant explained [REP4-013] that the specific method of drilling would be defined post-consent following further site investigation, detailed design and contractor engagement.
- 5.10.37. In response to NNDC's LIR [REP2-087], which welcomed the adoption of HDD the Applicant [REP3-011] confirmed that as R17 of the dDCO, a LaMS must be submitted for approval by NNDC, in consultation with the

relevant statutory nature conservation body, prior to commencement of the landfall works and export cable.

Cumulative Impacts

- 5.10.38. The Applicant's assessment of cumulative impacts for EIA effects for both scenarios [APP-221] was agreed by both NE [REP16-010] and the MMO [REP16-009] as being appropriate and consistent with agreed methodologies.
- 5.10.39. The Applicant's Cumulative Impact Assessment [APP-245] determined that there would be no significant impacts for marine physical processes, including water and sediment quality. While the MMO [REP16-009] expressed some concerns over the level of confidence in the conclusion of the CIA, it generally agreed that the level of risk would likely be minimal. NE concluded [REP16-010] that the applicant had made every effort to reduce impacts to an acceptable level and it is unlikely there would be a significant adverse impact to the wider marine processes.
- 5.10.40. No IP raised any comment relating to these issues during the Examination.

Conclusions

- 5.10.41. The ExA has carefully considered the concerns of IPs, and Happisburgh PC in particular, regarding coastal erosion. R17(2) of Schedule 1 of the rDCO states that the LaMS "*must include measures for long horizontal directional drilling below the coastal shore platform and cliff base at the landfall*". R17 also stipulates the need for ongoing inspection of the jointing pits and cables at the landfall and reporting of results to NNDC, in consultation with NE, during the operation of the authorised project. In the event of cable exposure throughout the operation of the Proposed Development, the Applicant must submit proposals to NNDC in consultation with NE for remedial measures to protect the cables at the landfall.
- 5.10.42. The ExA concludes that the Proposed Development, including embedded mitigation, would not have a significant impact on marine and coastal processes. While it is acknowledged that the coastline in the vicinity of landfall is actively eroding, the ExA is content that the Proposed Development would not contribute to coastal change in the area during the expected lifetime of the Proposed Development, even taking into account climate change.
- 5.10.43. The ExA concludes that the Applicant has complied with the requirements of NPS EN-1 and EN-3. The ExA is content that the Applicant has taken account of the broader context of coastal protection around the Proposed Development and that it would be resilient to coastal erosion and deposition, taking account of climate change, during the project's operational life and any decommissioning period.

- 5.10.44. The ExA is also content that the Applicant has had due regard to the appropriate marine policy documents, as provided for in the Marine and Coastal Access Act 2009, and the SMP.
- 5.10.45. Referring to NPS EN-3, the Applicant has provided information about alternative landfall sites and alternative cable installation methods that have been considered during the design phase and an explanation for the final choices made.
- 5.10.46. The ExA therefore concludes that no weight should be given to the issues examined in this Section in respect of marine and coastal processes for or against the order being made. Weights assigned to the issues examined in Section 5.9, Marine biodiversity, biological environment and ecology, and in relation to HHW SAC in Chapter 6 are given in those relevant sections of this report.

Draft DCO and schedule of mitigation

- 5.10.47. Part 3 R17(1) and (3) Landfall method statement have been amended to require the relevant statutory nature conservation body to be consulted by NNDC prior to approval of the method statement.
- 5.10.48. The Schedule of Mitigation [REP18-018] includes, for both Scenarios 1 and 2, the use of HDD techniques for cable installation at the landfall to ensure that there would be no impact to the coastline arising from construction works at landfall.

5.11. COMMERCIAL FISHERIES AND FISHING

Background and policy context

Introduction

- 5.11.1. This section considers the effects of the Proposed Development on commercial fisheries and fishing which was identified in the ExA's initial assessment of principal issues [PD-006].
- 5.11.2. The matters considered in this section are primarily physical effects including loss of fishing grounds and safety to fishing vessels during construction, operation and decommissioning. More general matters of maritime navigation safety are covered in Section 5.17 of this Recommendation Report. Effects on fish and shellfish populations are considered in Section 5.9 and socio-economic effects on the fishing industry are considered in Section 5.8 of this Recommendation Report.

National Policy Statements

- 5.11.3. The Overarching National Policy Statement for Energy EN-1 (NPS EN-1) does not expressly cover commercial fisheries and fishing considerations. The National Policy Statement for Renewable Energy Infrastructure NPS EN-3 provides the primary basis for decision making on DCO applications

for nationally significant renewable energy infrastructure. In reaching a decision the Secretary of State (SoS) should:

- a. be satisfied that the site selection process has been carried out so as to reasonably minimise adverse effects on fishing and fish stocks; where the decision-maker considers the wind farm would significantly impede protection of sustainable fisheries or fishing activity at recognised important fishing grounds this should be attributed correspondingly significant weight (NPS EN-3 para 2.6.132).
- b. be satisfied that the Applicant has developed the outline design of the proposed development having consulted representatives of the fishing industry with the intention of minimising loss of fishing grounds (NPS EN-3 para 2.6.133).
- c. consider the extent to which disruption to fishing has been mitigated, including that caused by implementation of safety zones; (NPS EN-3 para 2.6.136).

Marine policy

- 5.11.4. In addition to NPS EN-3, the Decision Maker must have regard to the appropriate marine policy documents, as provided for in the Marine and Coastal Access Act 2009 (MCAA2009).
- 5.11.5. The UK Marine Policy Statement (MPS) is the framework for preparing Marine Plans. The East Inshore and Offshore Marine Plans cover the area in which the Proposed Development is situated, relevant policies of which include:
 - FISH1 and GOV3 require proposals to demonstrate either that they will not prevent fishing activities or displace existing activities or the case for proceeding with proposals if it is not possible to minimise or mitigate adverse effects of displacement.
 - CAB1 requires decisions on proposals to take account of cable protection measures.

Other legislation and guidance

- 5.11.6. The Applicant's Planning Statement sets out the national, regional and local planning policies that are considered relevant [APP-693]. The legislation and guidance relevant to commercial fisheries and fishing is set out in the ES [APP-227], [APP-228]. Other legislation and policy are identified in Chapter 3 of the ES [APP-216].
- 5.11.7. Marine Guidance Note MGN 543 issued by the Maritime and Coastguard Agency (MCA) provides important guidance to developers on the safety aspects of offshore windfarms. MGN 543 is referenced in this Section in relation to fishing vessels and is discussed in more detail in Section 5.17 of this Recommendation Report.

The application

Environmental Statement

- 5.11.8. The application's Environmental Statement (ES) contains an assessment of potential impacts on Fishing and Fisheries in ES Chapter 14 Commercial Fisheries [APP-227]. Assessment on Fish and Shellfish Ecology is in ES Chapter 11 [APP-224a). Each of these chapters is supported by a number of appendices that contain figures, technical reports and details of surveys and data collection.
- 5.11.9. The ES Appendix 14.1 reports the technical studies on fishing undertaken that informs site selection, assessment of impacts and mitigation of effects on different fishing fleets and type of activity [APP-567]. Appendix 14.2 reports consultation undertaken with the fishing industry [APP-568]. Assessment of the impact of loss or restricted access to fishing grounds within or adjacent to the Proposed Development area was undertaken on the basis of national fleet and fishing method, in line with data collection groupings used by the relevant national fisheries data agencies.
- 5.11.10. The Applicant provided detailed assessment of the impacts of the Proposed Development on fish and shellfish species, including commercially fished species, in ES Chapter 11 Fish and Shellfish Ecology [APP-224a]. Potential impacts on fish stocks and the commercial fisheries are assessed within ES Chapter 14 ([APP-227] Section 14.7.4.1 for construction phase and Section 14.7.5.1 for operational phase). In both cases effects on fish and shellfish species, including those of commercial importance, are assessed as at worst minor adverse [APP-227, paras 169 and 249].
- 5.11.11. The application includes a Schedule of Mitigation [APP-688], which was updated during the Examination [REP18-017]. Embedded mitigation that is common across the project is set out in Section 5.1 of this Recommendation Report. The Applicant has proposed embedded mitigation to minimise adverse effects in relation to commercial fisheries that includes:
- a. reduction of the maximum number of WTGs and removal of floating foundations to reduce potential safety issues for fishing vessels;
 - b. use of an HVDC solution to reduce the number of export cables and volume of cable protection;
 - c. burying offshore export cables where possible to reduce the need for surface protection;
 - d. provision of information distribution and awareness communications, guard vessels and Fisheries Liaison Officers.
- 5.11.12. Assessment of safety issues for fishing vessels and as associated with seabed obstacles, gear snagging and the manoeuvrability of vessels is covered in ES Chapter 14 [APP-227 Section 14.7]. Different terminology is used in the Navigational Risk Assessment (NRA) such that risks assessed as "*within acceptable limits*" are considered "*not significant in EIA terms*". The Applicant concluded that safety risks for fishing vessels would be within acceptable limits, subject to mitigation [APP-227, paras 160, 166, 227 and 228 and Table 14.12, Impacts 6 and 13].

- 5.11.13. Specific safety risks associated with potential for collisions between fishing vessels and construction vessels and allision of fishing vessels with structures are addressed in ES Chapter 15 Shipping and Navigation [APP-228]. This is supported by an NRA [APP-569].
- 5.11.14. The risk of fishing vessel allision with OWF structures during operation (worst case) is assessed in the NRA as “*tolerable with mitigation*” in the Applicant’s ES [APP-228 Section 15.8.1 and Table 15.16] and therefore not significant in EIA terms. The ExA acknowledges that the terminology used for rating and significance of effects differs between NRA and EIA. Additional mitigation would be delivered through the Outline Fisheries Liaison and Co-existence Plan included with the application [APP-710] which is secured under the Project Environmental Management Plan (PEMP) by the DMLs Schedules 9 & 10 Part 4 Condition 14, Schedules 11 & 12 Part 4 Condition 9 and Schedule 13 Part 4 Condition 7.
- 5.11.15. The conclusion of the Applicant’s assessment is that effects of the Proposed Development alone on Commercial Fishing and Fisheries receptors are not anticipated to exceed minor adverse during construction, operation and decommissioning; including loss or restricted access to traditional fishing grounds within the array area, the interconnector area and cable corridor [APP-227 para 309 and Table 14.20]. Cumulative effects together with other projects are discussed below.

Cumulative impacts and effects

- 5.11.16. ES Volume 1 Chapter 10 [APP-223] (Benthic and Intertidal Ecology) and Chapter 11 [APP-224a] (Fish and Shellfish Ecology) characterise the effects of the Proposed Development on fish habitat and species. Matters in relation to these effects are addressed in Chapter 5.9 of this Recommendation Report. The Applicant’s assessment identified cumulative impacts to fish and shellfish species as minor adverse and any resulting effects on the commercial fisheries that target these species as not expected to exceed minor adverse [APP-227 Section 14.8.2.1.1].
- 5.11.17. Consideration was given by the Applicant in the cumulative impact assessment to permanent loss of fishing grounds associated with Marine Protected Areas (MPAs) and MFSD measures [APP-227, Section 14.8].
- 5.11.18. In regard to loss of or restricted access to fishing grounds for the project alone under either scenario, impacts to Anglo-Dutch beam trawling and Dutch beam trawling and seine netting activity are assessed by the Applicant as of moderate adverse significance; and for Belgian beam trawling, French pelagic and demersal trawling and UK inshore static gear and offshore long-line fishing, impacts are assessed by the Applicant as of minor adverse significance for the project alone, due to the assessed low sensitivity of the receptor and low magnitude of the effects [APP-227, Section 14.7].
- 5.11.19. The cumulative impacts in this regard for Dutch Seine netting and Anglo-Dutch Beam trawling are assessed by the Applicant to be moderate

adverse whether or not the Proposed Development is included in the cumulative assessment [APP-227 Section 14.8.1]. Cumulative impact of safety risks for fishing vessels is assessed as within acceptable limits [APP-227, para 304].

Local Impact Reports

- 5.11.20. Norfolk County Council's (NCC's) LIR refers to the potential for economic impact that the Proposed Development would have on Norfolk-based commercial fishing activities from its numerous ports and landing areas [REP2-085].
- 5.11.21. In this regard, NCC set out concerns specifically about commercial fishing businesses. While commercial fishing is an offshore issue, NCC considers the potential economic effects of the Proposed Development on this sector to be relevant, as Norfolk is home to many commercial fishing activities from its numerous ports and landing areas. NCC states that where there is likely to be a demonstrable impact on commercial fishing affecting communities in Norfolk, the Applicant should provide appropriate compensation (i.e. disturbance payments) to those fishing businesses affected.

Issues

- 5.11.22. The issues relating to fishing and commercial fisheries during the Examination were:
- a. cumulative loss of or restricted access to fishing grounds;
 - b. engagement with inshore fishing industry;
 - c. effects of safety zones during major maintenance;
 - d. reporting of shallow buried cables and cable exposure;
 - e. effects on safety for fishing vessels; and
 - f. changes sought to DML conditions and the Fisheries Liaison & Co-Existence Plan (FLCP).
- 5.11.23. The ExA examined these issues with reference to the appropriate legislation and policies described in Chapter 3 of this Recommendation Report through written questions and in an ISH on 22 January 2020 [EV7-001 to EV7-005]. These matters are also discussed in Section 5.17 in relation to Navigation and Shipping of this Recommendation Report and in Section 5.8 in relation to socio-economic considerations.
- 5.11.24. The Wildlife Trusts (TWT) [RR-040, AS-031 and REP2-098] raised concerns about how the effects of commercial fishing on habitats were included in the Applicant's assessment. This is discussed in detail in Chapter 6 of this Recommendation Report.

Cumulative loss of or restricted access to fishing grounds

- 5.11.25. NCC's LIR refers to the potential for economic impact that the Proposed Development may have on Norfolk-based offshore fishing activities [REP2-085].

- 5.11.26. The Applicant responded to NCC that co-existence with the fishing industry and mitigation for disruption to fishing is to be actively promoted but if a requirement for temporary relocation of legitimate fishing effort occurred as a result of the Proposed Development, evidence-based mitigation and, if necessary, disruption compensation would be considered in line with Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) guidance 2014¹¹ [REP3-008, Page 11]. The ExA is content that this would be secured through the FLCP within the PEMP secured by the DMLs (dDCO Schedules 9 & 10 Part 4 Conditions 14(1)(d), Schedules 11 & 12 Part 4 Conditions 9(1)(d), and Schedule 13 Part 4 Condition 7(1)(d).
- 5.11.27. Concerns were expressed by the National Federation of Fishermen's Organisations (NFFO), which is the representative body of the fishing industry in England, together with VisNed, their equivalent organisation in the Netherlands which represents the majority of Dutch demersal fisheries, who argued that their members' activities would be affected by the development and operation of the Proposed Development [RR-113]. It sought to address:
- a. the loss of fishing grounds for certain types of fisheries;
 - b. impediments for those that theoretically can still fish within the array; and
 - c. if cumulative impacts from other projects have been correctly assessed.
- 5.11.28. Having made separate Relevant Representations, the NFFO [RR-008] and VisNed [RR-113] subsequently combined their further representations to the Examination and their SoCG with the Applicant.
- 5.11.29. In response to WQ1 [PD-008, Q16.1.1] seeking justification why further mitigation of significant adverse effects has not been proposed, the Applicant clarified that cumulative residual moderate adverse impacts were identified for Dutch Seine netting and beam trawling and for Anglo-Dutch Beam trawling due to the effect of the Proposed Development together with other projects on loss of access to fishing grounds, but argued that the assessed impact for these fisheries of the Proposed Development alone is very small [REP2-021].
- 5.11.30. The NFFO/VisNed elaborated their objection that the cumulative impact assessment (CIA) should have taken account of the impact of existing plans and projects rather than taking these to be part of the baseline and that CIA should examine predicted future losses of commercial fishing grounds as well as past losses, and stated their concern that the Commercial Fisheries assessment in ES Chapter 14 should have been defined more quantitatively. Furthermore, the NFFO/VisNed claimed that a worst case assumption should be applied within the CIA that no towed-

¹¹ FLOWW (2014). Best Practice Guidance for Offshore Renewables Developments. Recommendations for Fisheries Liaison. FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group).

gear fishing activities would resume within operational OWFs. [REP2-043].

- 5.11.31. In response, the Applicant confirmed that the assessment (including the CIA) was carried out in line with standard EIA methodologies, and reiterated its position that “the current distribution and level of fishing activity already takes account of the presence of existing projects/activities”, arguing that including existing projects/activities for CIA would represent double-counting [REP3-007].
- 5.11.32. The ExA pursued at ISH4 the IP concerns on the methodology of assessment of cumulative loss of or restricted access to fishing grounds [EV7-001 to EV7-005]. The Eastern IFCA (EIFCA) agreed with NFFO that more quantitative assessment of loss of fishing grounds would be sensible; but also agreed with the Applicant that the potential impacts for the inshore fisheries have been adequately characterised [REP4-033].
- 5.11.33. The Applicant explained that effects on commercial fisheries and fishing from offshore projects that were under construction or operational during the five year period of time for which fisheries and fishing data is assessed in the baseline characterisation would be reflected in that baseline, and therefore inclusion of potential future losses associated with those projects in the cumulative assessment would represent double counting of their impact [REP5-051].
- 5.11.34. The Applicant maintained that the characterisation of fishing activity included in the commercial fisheries baseline in ES Chapter 14 was based on data from the last 5 years supplemented by data gleaned from consultation with stakeholders and was in line with standard EIA methodology for the assessment of loss of or restricted access to fishing grounds and confirmed that this baseline characterisation was agreed as appropriate with the Eastern IFCA and the MMO in their respective SoCGs [REP5-051].
- 5.11.35. In relation to the level of fishing activities that would be able to continue within the area of the Proposed Development, the NFFO/VisNed requested the Applicant to clarify under what circumstances it would regard damage to cables resulting from fishing activity to be actionable in law as the result of a wilful intent or negligence on the part of a fishing vessel operator [REP2-076]. The Applicant stated that each case would be judged on its merits whether claims for damage to cables would be brought [REP3-007]. There was no further representation on this matter from the IP.
- 5.11.36. During the Examination, the Applicant made a change to the project design envelope with a decrease in worst case total number of WTGs from 180 to 158 and corresponding increase in minimum spacing from 720m. to 800m. In the SoCG the NFFO/VisNed acknowledged this change but countered that they consider the minimum spacing between structures within OWFs to enable beam trawling fishing activity to resume is at least 1km and at least 2km in the case of seine netting [REP9-025, para 24]. The Applicant argued that it would be highly

unlikely for the seine netting method to resume in operational sites, but other fishing would in general be able to resume within operational OWF sites the level which would “*largely depend on the perception of individual skippers*”. The Applicant confirmed the assessment that in the case of beam trawling and seine netting by Anglo-Dutch and Dutch vessels, impact magnitude is considered to be ‘medium’ adverse in the worst case where skippers elect not to fish within the Proposed Development site during operation. [REP9-025, paras 28 to 31].

- 5.11.37. The MMO’s SoCG agreed [REP16-009] that:
- a. the ES adequately characterises the baseline environment in terms of Commercial Fisheries;
 - b. the impact significance conclusions of no worse than minor adverse for the project alone are appropriate; and
 - c. the cumulative impact of the Proposed Development together with other infrastructure (loss or restricted access to traditional fishing grounds effects) for Dutch beam trawling, Dutch seine netting and UK-based (Anglo-Dutch) beam trawling would be moderate adverse, and minor adverse for other beam trawling fleets including Belgian and UK beam trawlers and for French demersal and pelagic trawlers.

- 5.11.38. The NFFO/VisNed did not make any further representation in response to WQ5 [PD-022, Q5.6.0.2] asking them to confirm satisfaction or otherwise with the Applicant’s position on these matters but instead confirmed that the conclusions in their SoCG at Deadline 9 represent their final position [REP11-022].

ExA’s reasoning

- 5.11.39. The NFFO/VisNed continued to disagree up to the end of the Examination with the Applicant’s case that the baseline assessment adequately captures cumulative losses of fishing grounds for certain types of fishing [REP9-025]. However, the ExA accepts the Applicant’s argument that already operational offshore energy projects, active licenced marine activities and implemented conservancy measures are part of the existing (baseline) environment; because commercial fishing activity would already have adapted to them, any adverse effects would be reflected in the baseline characterisation in the ES [APP-227, para 237].
- 5.11.40. The ExA notes the case made by the NFFO/VisNed that fishermen may be deterred from fishing activity within the site area of the Proposed Development due to their assessment of risk of legal action arising for damage to cables, however because there is no established precedent or policy for such legal action and the ExA considers this potential additional deterrent to be marginal to the spatial constraints on fishing and therefore attributes little additional weight to this matter against the making of the Order.
- 5.11.41. The ExA also notes the Applicant’s argument that the proposed increase in spacing of WTGs may to some extent reduce impact on fishing from that assessed in the ES, and notes the sustained concerns of the

NFFO/VisNed about cumulative loss of fishing grounds but considers that this is adequately represented in the ES assessments, which have been agreed by the MMO, that:

- 5.11.42. Belgian beam trawling, UK inshore static gear and offshore long-line fishing, Anglo-Dutch beam trawling and Dutch beam trawling and seine netting fishing activity would be displaced either completely or partially from the Proposed Development site.
- 5.11.43. Taken in aggregate, the effect of loss of or restricted access to fishing grounds due to the impact of the Proposed Development alone would be negligible or minor adverse at worst.
- 5.11.44. However, the cumulative impact of loss of or restricted access to fishing grounds specifically for Dutch seine netting and beam trawling and Anglo-Dutch beam trawling would be moderate adverse whether or not the Proposed Development is included in the cumulative assessment; for Belgian beam trawling and French demersal and pelagic trawling it would be minor adverse and for locally-based inshore fishing vessels it would be minor adverse and therefore not significant in EIA terms.
- 5.11.45. The ExA accepts that the Applicant's assessment takes account of proposals for closures to fishing within MPAs in the North Sea (in UK, Dutch and German waters), representing a worst case, and notes the Applicant's argument that there is doubt whether all of the proposed closures within MPAs will be carried out [REP14-038, page 10].

Engagement with inshore fisheries industry

- 5.11.46. The EIFCA noted the potential for construction, decommissioning, and operation and maintenance activities within the export cable corridor to result in interference with inshore fishing activities, and noted the importance of recognising cumulative impacts of multiple windfarms on the viability of the inshore fishing industry and the need for extensive consultation with relevant stakeholders [RR-035].
- 5.11.47. The ExA notes that the Applicant proposes in the ES that impacts to UK-based local inshore fishing vessels (which may need to relocate their gear as an effect of construction activities) would be subject to implementation of evidence-based mitigation in line with FLOWW guidelines 2014 and 2015, for example if static gear needs to be relocated due to OWF activity [APP-227, paras 120 and 139 and Table 14.20].
- 5.11.48. The ExA is content that the FLOWW Best Practice Guidance 2014¹² represents an industry-standard approach to mitigation for disruption and displacement of fishing activity, and commercial compensation if necessary as set out in the FLOWW Recommendations for Fisheries

¹² FLOWW (2014). Best Practice Guidance for Offshore Renewables Developments. Recommendations for Fisheries Liaison. FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group).

Disruption Settlements and Community Funds 2015¹³. This FLOWW guidance is referenced in the Outline FLCP and its inclusion in the final FLCP is secured by be secured through the FLCP within the PEMP secured by the DMLs (dDCO Schedules 9 & 10 Part 4 Conditions 14(1)(d), Schedules 11 & 12 Part 4 Conditions 9(1)(d), and Schedule 13 Part 4 Condition 7(1)(d).

Effect of Safety Zones for SOVs during major maintenance

- 5.11.49. The NFFO/VisNed argued that 500m statutory safety zones around Service Offshore Vessels (SOVs) would be disruptive to fishing and unnecessary and serves as a further consideration as to how much fishing activity might resume within the OWF array after construction [REP2-043].
- 5.11.50. The MCA commented that: "*safety zones triggered by the use of SOVs during major maintenance are currently not supported by the MCA*" [REP3-007]. In response to WQ2 [PD-009], the MCA explained that although it understood the Applicant's preference to include a Safety Zone (SZ) for SOVs to deter fishing in close proximity, that is not a reason to justify a SZ and MCA holds that the SOV operationally should navigate safely in relation to other vessels in accordance with the international law of the sea (notably, in regard to collision avoidance) [REP5-072].
- 5.11.51. The Applicant commented that the MCA's position on SOVs relates to application of navigational guidance whereas the NFFO/VisNed's position relates to access to existing fishing grounds. The Applicant also commented that safety zones for SOVs during major maintenance are supported by the Department for Business, Environment and Industrial Strategy (BEIS) but the Applicant also accepts that a case for SOV Safety Zones would need to be made post-consent as part of the Safety Zone application process [REP5-045].
- 5.11.52. In the SoCG, VisNed/NFFO noted that experience on other OWFs is that SOVs are also used for routine maintenance works potentially several times a day which could be disruptive to fishing activities within the site [REP9-025 para 25].

ExA's reasoning

- 5.11.53. The ExA accepts the argument by the NFFO/VisNed that SOVs may be deployed during routine maintenance and that 500 metre safety zones applied to them would be a deterrent to the resumption of fishing within the area of the Proposed Development. The ExA also acknowledges the MCA position that safety zones for SOVs are not supported by the MCA

¹³ FLOWW (2015). Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds. FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group).

with whom, together with the MMO, the Applicant needs to agree Safety Zones post-consent.

5.11.54. Based on the interchange between the NFFO/VisNed and the Applicant discussed above, the ExA is satisfied that the policy test in NPS EN-3 (para 2.6.136) is met, by means of mitigation of disruption to fishing caused by implementation of future safety zones during maintenance (including the use of SOVs), which must be agreed by the undertaker with the regulators post-consent through the Offshore Operations and Maintenance Plan (OOMP), secured by rDCO Schedules 9 & 10 Part 4, Conditions 14(1)(j), Schedules 11 & 12 Part 4 Conditions 9(1)(j), and Schedule 13 Part 4 Condition 7(1)(i).

5.11.55. Therefore, the ExA does not consider potential effects on access to fishing grounds of safety zones for SOVs during major maintenance as a factor that would prevent the making of the Order.

Reporting of shallow buried cables and cable exposure

5.11.56. The NFFO/VisNed requested that the dDCO/DMLs securing reporting of dropped objects and exposure of cables should also refer to shallow buried cables as proposed by FLOWW Best Practice Guidance for Offshore Renewables Developments. In the SoCG the NFFO/VisNed proposed the addition to Schedules 9 & 10 Part 4 Condition 9 (12) of the words "*a state of shallow burial or exposure of ...*" in regard to cables on or above the seabed [REP9-025]. The Applicant rejected this change and confirmed that the condition wording "*exposure of cables on or above the seabed*" had been agreed in the SoCG with MCA [REP9-024] and TH [REP9-028], consistent with wording in the made DCO for the Norfolk Vanguard OWF [REP10-034].

5.11.57. The dDCO commits the undertaker to post-construction survey, monitoring and reporting of offshore cable installation through dDCO Schedules 9 & 10, Conditions 20 & 22, Schedules 11 & 12, Conditions 15 & 17 and Schedule 13, Conditions 11 & 13. Reporting to the MMO of Dropped Objects is secured under procedures secured by Schedules 9 & 10 Part 4 Condition 12 (10), Schedules 11 & 12 Part 4 Condition 7 (11) and Schedule 13 Part 4 Condition 5 (10).

5.11.58. The MCA sought [REP5-072] to have a three-day period for notice to mariners and to the Kingfisher Information Service of any cable exposure instead of the five-day period proposed in the outline FLCP. This change to 3 days' notice period has been accepted and actioned by the Applicant and agreed by the MMO. The ExA is satisfied that this is now secured in the rDCO which now has a notification of cable exposure period of 'three days' in Schedules 9 & 10, Condition 9(12), Schedules 11 & 12, Condition 4(12) and Schedule 13, Condition 3(12).

ExA's reasoning

5.11.59. The ExA is content that the MCA as well as TH are to be consulted on each plan prior to their approval by the MMO (dDCO Schedules 9&10, Conditions 14(1)(a), (d), (e) and (g), Schedules 11 & 12, Conditions

9(1)(a), (d), (e) and (g), and Schedule 13, Conditions 7(1)(a),(d), (e) and (g)).

- 5.11.60. TH maintained to the end of the Examination a request for additional wording in the dDCO/DML conditions to require specific consultation on steps to be taken should any cable protection exceed 5% of navigable depth [REP8-034]. The ExA agrees with this request and this issue is reported in the Section 5.17 and the recommended change reported in Chapter 9 of this Recommendation Report.
- 5.11.61. Therefore, the ExA does not consider effects of snagging risks to fishing gear due to cable exposure or shallow buried cables as a factor that would prevent the making of the Order. This matter is also covered in Section 5.17 of this Recommendation Report.
- 5.11.62. The ExA is also satisfied that the requirement of the East Inshore and East Offshore Marine Plans policy CAB1 to take account of cable protection measures has been met by the Applicant.

Effects on safety for fishing vessels

- 5.11.63. Potential effects of OWF service vessels on the safety of small (mostly under 10 metres) fishing vessels that operate relatively close to port was raised initially by the Caister Inshore Fishermens Association [RR-091] and followed up by EIFCA in [REP2-069] which emphasised the need for a strong commitment by the Applicant and any contractors for communications with the fishing industry to ensure safety.
- 5.11.64. The NFFO/VisNed jointly queried whether the safety assessment for fishing vessels in ES Chapter 14 ('Commercial Fisheries') Section 14.7.4.6 was methodologically suitable [REP2-043]. The MCA, as the regulatory body for navigational risk assessment, stated in answer to WQ2 [PD-009, Q2.11.0.1] that it interprets the ES Chapter 14 to be in accordance with the Appendix 15.1 NRA that safety risks to fishing vessels would be within acceptable limits subject to post-consent mitigation [REP5-072].
- 5.11.65. At ISH4 [EV7-001 to EV7-005], the ExA sought to understand how the Fisheries Co-Existence and Liaison Plan would mitigate risk to fishing vessels in the vicinity of survey, construction and service vessels for the Proposed Development. The Applicant responded that in addition to planning liaison and communication with stakeholders, a range of procedures would be developed in the final FLCP post-consent, including development of a fisheries guidance document to reduce interaction of activities connected with the OWF development with fishing activity and to provide response procedures. The Applicant therefore argued that the FLCP gives appropriate consideration to minimising interactions and safety issues between project vessels and fishing vessels [REP4-014]. In response to WQ2 [PD-009, Q2.6.0.3], EIFCA confirmed its satisfaction with the assessment of potential effects of windfarm service vessel traffic on fishing gear and safety of fishing vessels and reiterated the need for strong commitment to effective communication between developers and fishing industry [REP5-069].

- 5.11.66. The SoCG with EIFCA agreed the appropriateness of a range of measures covered in the FLCP to control potential interactions between windfarm vessels and commercial fishing vessels and fishing gear [REP9-019].

ExA's reasoning

- 5.11.67. The ExA is satisfied that mitigation for safety risks to fishing vessels and snagging risks to their gear is secured through the suite of pre-construction plans including the FLCP within the PEMP secured by the DMLs (rDCO Schedules 9 & 10 Part 4 Conditions 14(1)(d), Schedules 11 & 12 Part 4 Conditions 9(1)(d), and Schedule 13 Part 4 Condition 7(1)(d), and within the Cable Specification, Installation and Monitoring Plan (CSIMP) (dDCO Schedules 9 & 10 Part 4 Conditions 14(1)(g) Schedules 11 & 12 Part 4 Conditions 9(1)(g), and Schedule 13 Part 4 Condition 7(1)(g)).
- 5.11.68. Therefore, the ExA does not consider potential effects of the Proposed Development on safety of fishing vessels as a factor that would prevent the making of the Order. This matter is also covered in Section 5.17 of this Recommendation Report.

Changes sought to DML conditions and FLCP

- 5.11.69. TH maintained to the end of the Examination a request for additional wording in the dDCO/DML conditions to require specific consultation on steps to be taken should any cable protection exceed 5% of navigable depth [REP8-034]. The ExA agrees with this request and this issue is reported in detail in the Navigation & Shipping Section 5.17 of this Recommendation Report and the recommended change reported in Chapter 9 (Draft DCO and Related Matters).
- 5.11.70. The MMO sought the inclusion of wording within the outline Fisheries Liaison and Coexistence Plan (FLCP) to clarify that the MMO will not act as arbitrator in regard to compensation and will not be involved in discussions on compensation. The Applicant agreed to include such wording in the final FLCP to be submitted for approval by the MMO post-consent, but declined to make the change to the outline plan during the Examination considering it a level of detail necessary and appropriate only in the final FLCP. At the end of the Examination the SoCG records that the MMO and the Applicant had not reached agreement on the necessity to amend the outline FLCP [REP16-009, Pages 45 and 94]. However, the ExA accepts the Applicant's argument that this matter can be resolved post-consent and it does not in itself weigh against the making of an Order.

Conclusions

- 5.11.71. Having examined the application, the ES and the issues discussed above the ExA considers that:
- a. In accordance with NPS EN-3 para 2.6.133 the Applicant has consulted representatives of the fishing industry in developing the

outline design parameters with the intention of minimising loss of fishing grounds.

- b. In accordance with NPS EN-3 para 2.6.132 and para 2.6.136 the ExA has considered the extent to which the Proposed Development occupies any "*recognised important fishing grounds*" and whether the project would prevent or significantly impede protection of sustainable commercial fisheries and fishing activities during construction or over the operational period, and accords correspondingly significant weight.
- c. The ExA considers that requirements of the East Inshore and East Offshore Marine Plans policies FISH 1 and GOV3 have been met because a strong case has been made by the Applicant for proceeding with the Proposed Development where adverse effects cannot be minimised or mitigated and the CAB1 policy requirement to take account of cable protection measures has been met by the Applicant.

5.11.72. Based on the evidence and reasoning given above, the ExA concludes that:

- a. potential impacts of the project alone and cumulatively on fish and shellfish species, including those of commercial importance, are assessed as of no more than minor adverse significance; and therefore do not weigh against the making of the Order;
- b. disruption to inshore fishing activity, including the effect of safety zones, would be no greater than of minor adverse significance after mitigation for the project alone; and therefore does not weigh against the making of the Order;
- c. the ExA accepts the Applicant's assessment of likely cumulative residual effects of loss of or restricted access to fishing grounds for Dutch beam trawling and seine netting and Anglo-Dutch beam trawling to be moderate adverse and therefore significant in EIA terms, but because likely effects on all other fisheries would be negligible or minor adverse, the ExA correspondingly attributes little weight against the Order being made to adverse effects on commercial fisheries; and
- d. the NFFO/VisNed case that the potential for legal action for damage to cables from fishing activity might deter fishermen from returning to the project area after construction has some merit but because there is no established precedent or policy for such legal action and the ExA considers this potential additional deterrent to be marginal to the spatial constraints on fishing the ExA therefore attributes little additional weight to this matter against the making of the Order.

5.11.73. Taking all the matters reported above into consideration, the ExA attributes little weight against the Order being made to adverse effects of Proposed Development on Commercial Fisheries and Fishing.

5.11.74. However the ExA suggests that the cumulative effect of loss of or restricted access to fishing grounds for certain types of fishing activity, (whilst in itself being of limited weight against the making of an Order for an individual OWF development) could at some point lead to an

aggregated loss of or restricted access to fishing grounds that presents a strategic planning issue for Government consideration.

Recommended draft DCO (rDCO)

- 5.11.75. rDCO Schedules 9 & 10 Part 4 condition 14(1)(g), Schedules 11&12 Part 4 condition 9(1)(g) and Schedule 13 Part 4 condition 7(1)(f) have been amended to incorporate additional wording requested by TH to secure steps to be taken to ensure safe navigation if any cable protection is identified exceeding 5% of navigable depth [REP8-034]. IP representations on this matter are discussed earlier in this Section 5.11 and also reported in more detail in Section 5.17 of this Recommendation Report (Navigation and Shipping).
- 5.11.76. In making these changes to the rDCO, the ExA can confirm that if the SoS disagrees with this addition, there would be no concomitant changes necessary if the SoS were to adopt the Applicant's final dDCO drafting.

OTHER MATTERS

5.12. AIR QUALITY

- 5.12.1. Air Quality effects of construction activities and traffic are reported in Section 5.4 of this Recommendation Report: Onshore Construction Effects. Air quality effects on Biodiversity are covered in Section 5.6.

5.13. AVIATION AND RADAR

Background and policy context

Introduction

- 5.13.1. This section considers the impact of the Proposed Development on Aviation and Radar which was not considered as a principal issue in the ExA's initial assessment but was referenced as point (iii) in Navigation and Shipping in the ExA's Rule 6 letter [PD-006]. This section covers:

- effects on civil and military radar communication, navigation, surveillance systems; and
- effects on civil and military aviation including search and rescue.

- 5.13.2. Effects of the Proposed Development on onboard radar for maritime navigation are considered within the principal issue of Navigation and Shipping in Section 5.19 of this report.

National Policy Statements

- 5.13.3. The Overarching National Policy Statement for Energy (NPS EN-1) Section 5.4 (Civil and military aviation and defence interests) requires the Applicant to consult with the Civil Aviation Authority (CAA), Ministry of Defence (MoD) and NATS (formerly National Air Traffic Services) in preparing its assessment of potential effects on aviation or other defence interests (NPS EN-1, paras 5.4.10, 5.4.11, 5.4.12); and that the SoS should be satisfied that:
- a. effects on civil and military aerodromes, aviation technical sites and other defence assets have been addressed by the applicant and that any necessary assessment of the proposal on aviation or defence interests has been carried out. (NPS EN-1 para 5.4.14).
 - b. Relevant parties have made appropriate efforts to identify realistic, pragmatic solutions to any conflicts between energy and transport policies and military interests (NPS EN-1 para 5.4.15).
 - c. After reasonable mitigation the Proposed Development would not significantly compromise use of defence assets or significantly limit military training or the safe and efficient provision of air traffic control services for civil aviation (NPS EN-1 para 5.4.17).

Other legislation and guidance

- 5.13.4. The legislation and guidance relevant to Aviation and Radar is set out in the ES Chapter 16 [APP-238, Section 16.2]. Key legislation and policies are identified in Chapter 3 of the ES [APP-216]. The Applicant's Planning Statement sets out the national, regional and local planning policies that are considered relevant to the Proposed Development [APP-693].

The application

Environmental Statement

- 5.13.5. The application's Environmental Statement (ES) contains an assessment of potential effects of Proposed Development on civil and military aviation and other defence interests, in ES Volume 1 Chapter 16 Aviation and Radar [APP-229].
- 5.13.6. The Applicant consulted with CAA, MoD and NATS and helicopter operators and Air Traffic Control service providers with regard to establishing if a perceived impact would be created to helicopters operating on Helicopter Main Routes (HMRs) in the region of the Proposed Development; no potential effects of operating on HMRs were identified [APP-229].
- 5.13.7. The application includes a Schedule of Mitigation [APP-688], which was updated during the Examination [REP18-017]. The Applicant has proposed two types of mitigation to minimise adverse effects on Aviation and Radar:
- a. embedded mitigation which is secured through the design plan of the Proposed Development offshore, an Aids to Navigation Management Plan and an Emergency Response Co-operation Plan (ERCoP) all of which would be secured through DML conditions in the dDCO;
 - b. additional mitigation, described in Section 6.5.5.2 of ES Chapter 16 [APP-219], which was adopted by the Applicant during the EIA process to reduce or eliminate any predicted significant impacts as detailed in the Schedule of Mitigation [REP18-017] and secured through various control documents and dDCO requirements.
- 5.13.8. Embedded mitigation that is common across the project is set out in Section 5.1 of this Recommendation Report. Embedded mitigation in relation to Aviation and Radar is detailed in Section 16.7.2 of ES Chapter 16 [APP-229]. This includes lighting of structures; consultation on HMRs and information provided to airmen and Search and Rescue (SAR) bases on construction and decommissioning of the Proposed Development; and an ERCoP to be approved by the MMO in consultation with the MCA, all secured through DML conditions in the dDCO.
- 5.13.9. The ES states that additional mitigation of safety risk to helicopter air traffic operating across the OWF site would be implemented through Air Traffic Services (ATS) and Search and Rescue (SAR) services that are both already in place to support the existing offshore oil & gas operations in the locality of the Proposed Development [APP-229 para 92].

- 5.13.10. Additional mitigation of potential effects to civil and military radar as detailed in Sections 16.7.5 to 16.7.7 of ES Chapter 16 [APP-229] is agreed in principle that would reduce significant adverse effects of the Proposed Development to the Cromer Primary Surveillance Radar (PSR) civil system and Air Defence Radar (ADR) located at Royal Air Force (RAF) Trimingham in North Norfolk to "*not significant*". This and additional mitigation, to be agreed in detail with NATS and MoD prior to offshore construction works, is discussed in more detail below.

Cumulative impacts

- 5.13.11. The ES reports that with additional mitigation as agreed in principle with NATS and the MoD the standalone and cumulative residual effects of impact to the Cromer PSR civil system and ADR located at RAF Trimingham are assessed as not significant after mitigation [APP-229 paras 103]. This is discussed in more detail below.
- 5.13.12. The ES states that potential cumulative impacts arising from safety risk to increased helicopter air traffic operating in connection with and in transit across the Proposed Development are assessed as not significant after mitigation because infrastructure for and provision of Air Traffic Services (ATS) and Search and Rescue (SAR) services are both already in place to support the existing offshore oil & gas operations in the locality of the Proposed Development [APP-229 para 104].

Issues

- 5.13.13. The main aviation and radar issues raised in Relevant Representations and safeguarding objections made by IPs that were examined by the ExA in relation to the policy tests described above were potential effects of the Proposed Development on:
- a. MoD aviation and ADR;
 - b. Civil ATS Radar; and
 - c. SAR operations.

MoD aviation and Air Defence Radar (ADR)

- 5.13.14. The MoD submitted a safeguarding objection regarding interference to the effective operation of the ADR system at RAF Trimingham, if unmitigated. MoD also confirmed that the Applicant has submitted a technical mitigation concept, which has been accepted by the MoD, to address adverse effects of the Proposed Development upon ADR [AS-013]. The MoD subsequently confirmed [REP2-074] that its safeguarding objections have therefore been removed subject to the inclusion of agreed wording in dDCO Requirement 13 (R13) which is included in the rDCO.
- 5.13.15. MoD also submitted a safeguarding objection on the need to attach aviation warning lighting to relevant offshore structures as necessary to maintain military aircraft safety and mitigate impacts of Proposed Development upon military low flying training activities [AS-013]. MoD subsequently confirmed that its safeguarding objections have been

removed subject to the inclusion of agreed wording in dDCO R12 [REP2-074].

Civil Air Traffic Services Radar

- 5.13.16. NATS Safeguarding registered as an IP [RR-003] and subsequently wrote to state that it remained engaged with the Applicant [AS-039]. NATS then confirmed that it is "*prepared to withdraw its objection to the application subject to the imposition of the agreed requirements*" These requirements had already been incorporated in R34 in the dDCO submitted with the application [REP2-082]. The ExA is satisfied that final dDCO matches the wording required by NATS [REP18-009].
- 5.13.17. The ES Chapter 16 noted that Anglia Radar had not responded to consultation [APP-229]. The ExA asked the Applicant for an update [PD-008, Q11.1.2]. The Applicant did, confirming that the Air Traffic Control Manager at Anglia Radar had agreed that mitigation of radar effects already agreed with NATS meets the needs of the Anglia Radar operation and in respect to HMRS, Anglia Radar had no objection to the Proposed Development [REP2-021].

SAR operations

- 5.13.18. The Maritime and Coastguard Agency (MCA) raised an objection that the Navigational Risk Assessment (NRA) submitted by the Applicant assesses only one line of orientation of WTGs [REP2-092].
- 5.13.19. The MCA asked that every endeavour should be made by the Applicant in the final layout design to adopt at least two lines of orientation as recommended in their MGN 543 Guidance document for OWF's to minimise risks to SAR aircraft operating within the site, recognising that there is scope to consider bespoke safety justification which demonstrates why a single line of orientation may be acceptable from a safety of navigation and SAR perspective.
- 5.13.20. Discussion took place in ISH4 on the lines of orientation in which the Applicant acknowledged the MCA preference for two lines of orientation. The Applicant confirmed that if it were to seek to develop a layout with a single line of orientation the Applicant would aim to demonstrate the safety of fewer than two lines by the submission of a safety justification of the Design Plan for agreement with the MMO and MCA post-consent (secured by dDCO Schedules 9 and 10 DML Condition 14(1)(a)) [EV7-002] to [EV7-004] and [REP4-014]. Subsequently, the MCA agreed that the final layout design of OWF lines of orientation would be subject to agreement in writing post-consent with the MMO in consultation with the MCA and TH [REP9-024].
- 5.13.21. The MCA also agreed that dDCO Schedules 9 & 10 Part 4 Condition 15 and Schedules 11 & 12 Part 4 Condition 10 appropriately secure an ERCoP in compliance with MGN 543 Annex V to be discussed and agreed throughout the post-consent process to the satisfaction of MMO and MCA [REP9-024].

Conclusions

- 5.13.22. Having carefully examined the application, the ES and the issues discussed above the ExA concludes that in accordance with NPS EN-1 Section 5.4:
- a. the Applicant has consulted with CAA, MoD and NATS and other relevant stakeholders helicopter operators and ATC service providers in preparing its assessment of potential effects on aviation or other defence interests (NPS EN-1, paras 5.4.10, 5.4.11, 5.4.12);
 - b. the Applicant's assessment of potential effects of the Proposed Development appropriately covers civil or military aviation and/or other defence assets, including radar (NPS EN-1 para 5.4.14);
 - c. there are no unresolved conflicts between the Proposed Development and military interests (NPS EN-1 para 5.4.15);
 - d. there are no outstanding objections to the Proposed Development in regard to Aviation and Radar from IPs who have agreed that after mitigation secured by dDCO R12, R13 and R34 the Proposed Development would not significantly compromise use of defence assets or significantly limit military training or safe and effective provision of air traffic control services for civil aviation (NPS EN-1 para 5.4.17);
- 5.13.23. The ExA is also satisfied that post-consent submission of details prior to construction concerning lighting to and final design layout of offshore structures in relation to SAR arrangements for agreement by the relevant authorities is secured by DML conditions within the rDCO Schedules 9 & 10, Part 4 Conditions 10, 14 and 15, Schedules 11 & 12 Part 4 Conditions 5, 9 and 10, and Schedule 13 Part 4 Conditions 4 and 7 as agreed in the SoCG with MCA [REP9-024] and with TH [REP9-028].
- 5.13.24. The ExA concludes that no weight should be given in respect of aviation and radar matters for or against the Order being made.

5.14. CLIMATE CHANGE

Background and policy context

Introduction

- 5.14.1. This section considers the climate change effects of the proposed development. Flood risk is detailed in Section 5.7 (Water Resources and Flood Risk) of this report and coastal erosion is detailed in Section 5.10 (Marine and Coastal Processes).

National Policy Statements

- 5.14.2. NPS EN-1 states that the Government is committed to cut greenhouse gas emissions by at least 80% by 2050, compared to 1990 levels (para 2.2.1). It sets out how the energy sector can help deliver the Government's climate change objectives by clearly setting out the need

for new low carbon energy infrastructure to contribute to climate change mitigation (para 2.2.11).

- 5.14.3. Applications for development consent should be assessed on the basis that the Government has demonstrated that there is a need for the types of energy infrastructure covered by NPS EN-1 and that the scale and urgency of that need is as described for each of them in the NPS (para 3.1.3).
- 5.14.4. Substantial weight should be given to the contribution which projects would make towards satisfying this need when considering applications for development consent under the Planning Act 2008 (para 3.1.4).
- 5.14.5. To largely decarbonise the power sector by 2030, it is necessary to bring forward new renewable electricity generating projects as soon as possible; the need for new renewable electricity generation projects is therefore urgent (para 3.4.5).
- 5.14.6. In terms of climate change adaptation, NPS-EN1 cautions that if new energy infrastructure is not sufficiently resilient against the possible impacts of climate change, it will not be able to satisfy the energy needs outlined in Part 3 of this NPS (para 4.8.1). The decision maker must therefore take into account the potential impacts of climate change using the latest UK Climate Projections available at the time the ES was prepared to ensure it has identified appropriate mitigation or adaptation measures. Should a new set of UK Climate Projections become available after the preparation of the ES, the decision maker should consider whether it needs to request further information from the applicant (para 4.8.6).
- 5.14.7. The decision maker should also be satisfied that there are not features of the design of new energy infrastructure critical to its operation which may be seriously affected by more radical changes to the climate beyond that projected in the latest set of UK climate projections, taking account of the latest credible scientific evidence on, for example, sea level rise and that necessary action can be taken to ensure the operation of the infrastructure over its estimated lifetime.
- 5.14.8. NPS-EN3 does not seek to repeat the material set out in EN-1. The two documents are intended to be read together. EN-3 notes that EN-1 includes assessments of the need for new major renewable energy infrastructure. In the light of this, the decision-maker should act on the basis that the need for infrastructure covered by EN-3 has been demonstrated by EN-1.
- 5.14.9. Both EN-1 and EN-3 contain policies which seek to guide the assessment of specific topics relevant to the application. The National Policy Statement for Electricity Networks Infrastructure (EN-5) is of limited relevance to the assessment of climate change for the Proposed Development given that overhead lines are not being used and the embedded mitigation includes underground cabling.

Climate Change Act 2008 (as amended)

- 5.14.10. The Climate Change Act 2008 set in legislation the UK's approach to tackling and responding to climate change. The Climate Change Act 2008 (2050 Target Amended) Order 2019 Act made on 26 June 2019 introduced the UK's long-term legally binding 2050 target to reduce greenhouse gas emissions to "*net-zero*", which requires the net UK carbon account for the year 2050 to be 100% lower than the 1990 baseline. The sixth carbon budget for the period up to 2035 was due to be published in December 2020.

The application

Environmental Statement

- 5.14.11. The Applicant's assessment of impacts of and adaptation for climate change is set out in the following documents:
- a. ES Chapter 8 Marine Geology, Oceanography and Physical Processes [APP-221]; and
 - b. ES Chapter 20 Water Resources and Flood Risk [APP-233].
- 5.14.12. The primary impacts in relation to climate change considered by the Applicant are the impacts of the proposed development on coastal processes and geomorphology, rises in sea-level and wave heights and flood risks.
- 5.14.13. The Applicant's assessment considers two scenarios [APP-218] as described in section 5.1. In terms of climate change and adaptation, effects are the same for both Scenario 1 and 2.
- 5.14.14. The main issues relating to Climate Change considered during the Examination included:
- a. coastal erosion;
 - b. sea level rises and storm surges;
 - c. flood risk;
 - d. compliance with 2018 UK Climate Projections (UKCP18); and
 - e. Greenhouse Gas Footprint assessment.
- 5.14.15. The ExA examined these issues through written questions [PD-009] and [PD-014]. No regulator or other IP expressed any concerns relating to these issues throughout the Examination.
- 5.14.16. The Applicant has proposed two types of mitigation to minimise adverse effects:
- a. embedded mitigation which is secured through the design of the Proposed Development and through the Outline Code of Construction Practice [REP5-010] and Outline Landscape and Ecological Management Strategy [REP5-022]; and
 - b. additional mitigation, described in Section 6.5.5.2 of ES Chapter 6 [APP-219], which was adopted by the Applicant during the EIA process to reduce or eliminate any predicted significant impacts as detailed in the Schedule of Mitigation [REP6-009] and secured through various control documents and dDCO requirements.

- 5.14.17. Embedded mitigation in relation to coastal erosion is detailed in section 8.7.4.1 of ES Chapter 8 [APP-221] and comprises of using a long horizontal directional drilling (HDD) to install cables at the landfall. Cables would be buried at sufficient depth below the coastal shore platform and cliff base to have no effect on coastal erosion. Natural coastal erosion throughout the lifetime of the project has been taken into account within the project design by ensuring appropriate set back distances from the coast for the HDD entry point.
- 5.14.18. With reference to sea level rises and storm surges, the Applicant has assessed in section 8.6.6 of Chapter 8 [APP-221] that rises in sea level will not change significantly through the design life of the project and that there is predicted to be an insignificant impact on storm surges over the lifetime of the Proposed Development and no mitigation is considered necessary.
- 5.14.19. In terms of flood risk, as detailed in Section 5.7 of this Recommendation Report, the residual impacts following mitigation under Scenario 1 resulting from increased surface water runoff, altered groundwater flows and changes to flood risk are summarised for each receptor in Table 20.37 and for Scenario 2 they are summarised in Table 20.39 of [APP-233] and in each Scenario range from negligible to minor adverse.

Issues

Climate Change Adaptation

- 5.14.20. The ExA at WQ2 [PD-009] requested the Applicant to provide a statement on how climate change adaptation has been considered both onshore and offshore, with particular reference to resilience of offshore infrastructure to storms. The Applicant accordingly provided its statement in which it stated that to ensure long term resilience in the face of climate change, it has embedded mitigation into the design of the project to account for predicted climate change scenarios both onshore and offshore [REP5-045]. Allowance has been made for coastal erosion through selection and design of the HDD method, burial depth and set back transition pit location. Seaward of landfall, burial of export cables to 5.5.m below LAT would ensure cables remained buried following storm events.
- 5.14.21. Having examined the evidence provided by the Applicant during the Examination, the ExA is content that the Applicant has considered climate change adaptation within the design of the Proposed Development.

Coastal Erosion

- 5.14.22. Coastal erosion is examined in detailed in Section 5.10 Marine and Coastal Processes of this report. The resilience of the cable landfall to climate change is summarised below.
- 5.14.23. In response to WQ3, the Applicant stated that the design of the cable landfall provides for the Transition Joint Bays to be set back from the

beach and cliff-line at a minimum of 125m, with flexibility to set back up to 325m, sufficient to accommodate not only the most up to date information and forecasts of coastal erosion but also beyond [REP7-017]. The final set back would be informed by predictive models of coastal processes, together with data from periodic surveys of the coastline at the landfall location.

Sea level rises and storm surges

- 5.14.24. Referring to sea level rises and storm surges, in response to the WQ3, the Applicant stated that all offshore infrastructure would be designed against standards which include extreme events to ensure resilience to both climate change and storm events [REP5-045] and [REP7-017].
- 5.14.25. Accepted long-term climatic trends such as sea-level rise and increasing sea and air temperatures would be taken into account when defining load cases for structures and electrical infrastructure. Offshore structures would be designed in accordance with accepted design standards. The 'ultimate limit state' load case would be based on a 1-in-100-year storm event. Subsea cables would be protected from storm action throughout the lifetime of the project as they would be installed 1 to 2m below seabed level and would be surveyed on a routine basis to identify (and re-bury) any sections that were becoming unburied due to seabed mobility.
- 5.14.26. The use of predictive modelling to inform detailed design would include any relevant effects of known climate trends (such as sea level rise) in the scope of the model. The Applicant would work closely with its advisers and consultants to ensure that these effects were properly understood and quantified, with reference to state-of-the-art climate projection tools such as UKCP18.
- 5.14.27. The ExA concludes that the Applicant's approach, of using return periods of one in 100 years for a 30-year design life, should provide adequate protection against extreme sea level rises and storm surges for the offshore infrastructure. The ExA is content with this approach.

Flood risk and compliance with 2018 UK Climate Projections

- 5.14.28. The ExA expressed concerns at WQ1 regarding how allowances for climate change had been considered by the Applicant for the operational drainage plan, and whether the Flood Risk Assessment takes account of UKCP18 [PD-008]. The ExA also required clarification at WQ3 of the allowance for climate change in the attenuation capacity at sub-stations [PD-014]. These concerns were examined throughout the Examination and are discussed in Section 5.7 of this Chapter.
- 5.14.29. In response to WQ1, the Applicant responded that as the EA had not provided guidance around the use of the UKCP18 at the time of the application these projections had not been considered [REP1-041]. However, as detailed in Section 5.7 of this report, the Applicant provided clarification that the outline drainage design assumptions referenced in the FRA included a 40% allowance as a contingency to demonstrate proof

of concept for the purposes but that the 20% figure is in fact the correct level of climate allowance required in line with EA's Climate Change Allowance Guidance [REP7-017]. Both NCC, as the Lead Local Flood Authority [REP6-035], and EA [REP7-062] are content with this approach. The ExA is also content that the Applicant has complied with the latest climate change projections.

Carbon Footprint Assessment

- 5.14.30. In its R17 request for information issued on 17 July 2020, the ExA requested the Applicant to provide a carbon footprint for the Proposed Development in support of the "*zero net carbon*" target within the Climate Change Act 2008 (2050 Target Amended) Order 2019 made on 26 June 2019. The assessment was to separately provide carbon assessments for onshore and offshore facilities.
- 5.14.31. The Applicant provided its Carbon Footprint Assessment at D14 [REP14-046]. It concluded that Green House Gas (GHG) emissions from construction and the 30-year operation of the Proposed Development are anticipated to be up to 1,860,339 tonnes CO₂e under Scenario 1, and up to 1,939,031 tonnes CO₂e under Scenario 2. The largest GHG contribution would be embodied emissions within materials to be used during construction, particularly in the offshore components of the project.
- 5.14.32. With regard to the split between onshore and offshore facilities during construction, under Scenario 1 onshore emissions are assessed to be 60,365 tonnes CO₂e and under Scenario 2 emissions are 137,640 tonnes. The offshore component for both Scenarios is 1,599,239 tonnes CO₂e, which is the largest component of the total emissions.
- 5.14.33. The Applicant used a high-level approach in estimating the amount of energy that could be produced by the Proposed Development, multiplying the installed capacity of 1,800MW by the hours in the year and applying a load factor of 58.4%, as advised by BEIS. A 90% availability factor was applied based on the ability of the OWF to generate power given appropriate weather and grid conditions. This resulted in an estimate for energy generated over the 30-year lifetime of the project to be 248,000GWh.
- 5.14.34. The GHG intensity of energy produced by the Proposed Development was anticipated to be between 7.48 to 7.80g/CO₂e/kWh. This results in carbon payback of emissions being likely to be one to two years from first generation of electricity for the UK grid. Consequently, the Applicant considers that the Proposed Development would produce zero GHG energy from the second year of operation.
- 5.14.35. Mulbarton Parish Council [REP16-023] provided a commentary on the carbon footprint assessment and climate change at D16. It challenged the Applicant's assumptions that the whole of the renewable energy output from the Proposed Development would be able to reach the main centres of demand throughout the 30-year project lifetime; that no onshore grid constraints come into effect during that time; and that an

equivalent amount of non-renewable energy generation would be withdrawn, as soon as the project would be completed. The Parish Council estimates that the proposed Development would contribute approximately 2.5% of total UK electricity demand and the impact on global CO₂ emissions could be a reduction of 0.02% compared to an annual increase of approximately 2.0% per year. It draws the conclusion that there is no compelling urgency to connect the Norfolk Boreas OWF project to the grid.

- 5.14.36. The Applicant responded at D17 quoting the Climate Change Act carbon budgets, Paris Agreement and Government announcements referring to plans to make the UK a world leader in green energy and to power all UK homes using renewable energy from offshore windfarms by 2030 to counter the conclusion of no compelling urgency [REP17-003]. The Applicant also refers to the Norfolk and Suffolk Local Industrial Strategy which seeks to position the region as the "*UK's clean growth region*", focusing on three opportunity areas: clean energy, agri-food and ICT/digital creative.
- 5.14.37. Having reviewed the report and Mulbarton Parish Council's submission, the ExA accepts that, at this early stage of design, there are inherent uncertainties associated with the carbon footprint assessment. The ExA is, however, content that after an initial period of carbon payback of around one to two years, the Proposed Development would contribute to the Government's net zero GHG energy target.

Conclusions

- 5.14.38. In terms of climate change and adaptation, with the exception of Mulbarton Parish Council, there was no disagreement between parties on any issue. Most of the discussions were initiated by the ExA for clarification. The issues raised were equally applicable to both Scenario 1 and Scenario 2. As detailed above, the ExA accepts that at this early stage of design there are uncertainties associated with the carbon footprint assessment but are content that the concerns of Mulbarton Parish Council should not count against granting of the Order.
- 5.14.39. The ExA is content that for climate change and adaptation the Proposed Development would not result in significant adverse effects and that all mitigation is secured appropriately.
- 5.14.40. In terms of compliance with the requirements of NPS EN-1 and EN-3, the Climate Change Act 2008 and the Climate Change Act 2008 (2050 Target Amended) Order 2019 Act, the ExA concludes that the Applicant has complied with the requirements.
- 5.14.41. Referring to EN-1, the ExA can confirm that the Applicant has used the latest UK Climate Projections available at the time of close of the Examination. The ExA is also satisfied that there are no features of the design of the Proposed Development which are critical to its operation which may be seriously affected by more radical changes to the climate

beyond that projected in the latest set of UK climate projections over the estimated lifetime.

- 5.14.42. The ExA therefore concludes that no weight should be given in respect of climate change and adaptation for or against the order being made. In terms of GHG emissions, the ExA concludes that substantial weight should be given in favour of making the order to the contribution the Proposed Development would make to achieving zero carbon energy.
- 5.14.43. For the reasons given above, there are no recommended changes to the dDCO and its requirements or control documents in relation to climate change or adaptation.

5.15. GRID CONNECTION

Background and policy context

Introduction

- 5.15.1. Grid connection was identified as a principal issue in the ExA's initial assessment, as reported in the ExA's Rule 6 letter [PD-006]. This Section reports on issues relating to the location of the grid connection. Other related matters have been reported in Section 5.3 of this Recommendation Report.

National Policy Statements

- 5.15.2. NPS-EN1 recognises that the connection of a proposed electricity generation plant to the electricity network is an important consideration for applicants wanting to construct a generation plant. It states that the applicant should:
- a. ensure that there will be necessary infrastructure capacity within an existing or planned distribution network to accommodate the electricity generated; and
 - b. liaise with the relevant distribution network operator to secure a grid connection.
- 5.15.3. In reaching a decision the SoS should:
- a. be satisfied that there is no obvious reason why a grid connection would not be possible (NPS EN-1, para 4.9.1);
 - b. take into account that National Grid has a statutory duty to provide a connection whenever and wherever one is required, and is also required to bring forward efficient and economical proposals in terms of network design, taking into account current and reasonably anticipated generation demand (NPS EN-5, para 2.3.5);
 - c. take into account that the onshore elements of the grid connection (Overhead Line and substations) are determined in accordance with NPS EN-5 (NPS EN-3, para 2.6.41).

- 5.15.4. The legal and policy requirements set out for alternatives which are relevant to this Section are set out in Section 5.3 of this Recommendation Report.

Other legislation and policies

- 5.15.5. Key legislation and policies are identified in Chapter 3 of this Recommendation Report [APP-216]. The Applicant's Planning Statement sets out the national, regional and local planning policies that are considered relevant to the Proposed Development [APP-693].

The application

Environmental Statement

- 5.15.6. The Applicant's case for a grid connection point is set out within ES Chapter 4 Site Selection and Assessment of Alternatives [APP-217], supported by Appendices [APP-537] to [APP-539], and the Design and Access Statement (DAS) [REP14-014].

Local Impact Reports

- 5.15.7. Breckland Council is supportive of renewable energy and considers that the Proposed Development could be accommodated in the District. However, the council is concerned about the adverse effects of the Proposed Development on the landscape of the area, which it considers to be unique and of great importance [REP2-065].
- 5.15.8. NCC supports the principle of the Proposed Development and considers that the Applicant should work with National Grid and UK Power Networks to consider options regarding the potential to feed electricity into the local transmission networks [REP2-085].

Issues

Alternative solution to grid connections (*'offshore ring main'*)

- 5.15.9. Many IPs, including Necton PC [REP5-063], Necton Substation Action Group (NSAG) [REP5-085], Cawston PC [RR-016], Oulton PC [RR-017], Happisburgh PC [REP1-045], Mulbarton PC [REP13-030] and at least one landowner and many individuals argued that grid connection through an 'offshore ring main' (ORM) should be considered by the Applicant and in this Examination. The MP for Mid Norfolk and the MP for North Norfolk set out their views on the need for integrated offshore design and connection via an ORM which would reduce the need for multiple cable corridors and substations across Norfolk and Suffolk [REP1-064]. A further representation on this matter was made by the then Conservative parliamentary candidate for Mid Norfolk who was pleased at the SoS (BEIS) announcement that a strategic review would be launched and argues that a proper strategic plan is needed for the delivery of this infrastructure, which most likely should come in the form of an ORM [REP2-012]. The NFU/LIG mentions that they have been campaigning for an ORM to reduce the onshore infrastructure required by the OWF industry [REP3-018, Q7.0.4].

- 5.15.10. The Applicant explains that an ORM is only one option for potential east coast grid reinforcement, although it is the colloquial terminology used by many [REP7-017, Q3.7.0.1]. As IPs mainly used the term ORM, the ExA has continued the use of the term in this Recommendation Report, but acknowledges the point made by the Applicant.
- 5.15.11. A number of IPs highlight the National Grid Electrical Transmissions Business Plan 2021 to 2026, which details the future 'Near Shore Loop' strategy and the Ofgem decarbonisation Action Plan dated February 2020. Some state that the timescale for the Proposed Development could allow alternative connection to the grid to be considered as part of the Examination process to ensure the best value infrastructure is implemented [REP5-063].
- 5.15.12. At D13, Mulbarton PC submitted reports [REP13-030] and [REP14-049] to demonstrate that integrated offshore transmission for the Proposed Development, Norfolk Vanguard OWF and Hornsea Project Three OWF could be achieved without any significant delay to existing project timescales. In the report, Mulbarton PC concludes that the direct connections to the grid would offer a positive cost benefit analysis outcome, minimise negative social, economic and environmental effects, reduce the longer-term costs passed on to consumers, and increase energy security. On that basis, Mulbarton PC objects to the onshore component of the Proposed Development.

Figure 5.15.1 and 5.15.2: extract from [REP13-030]

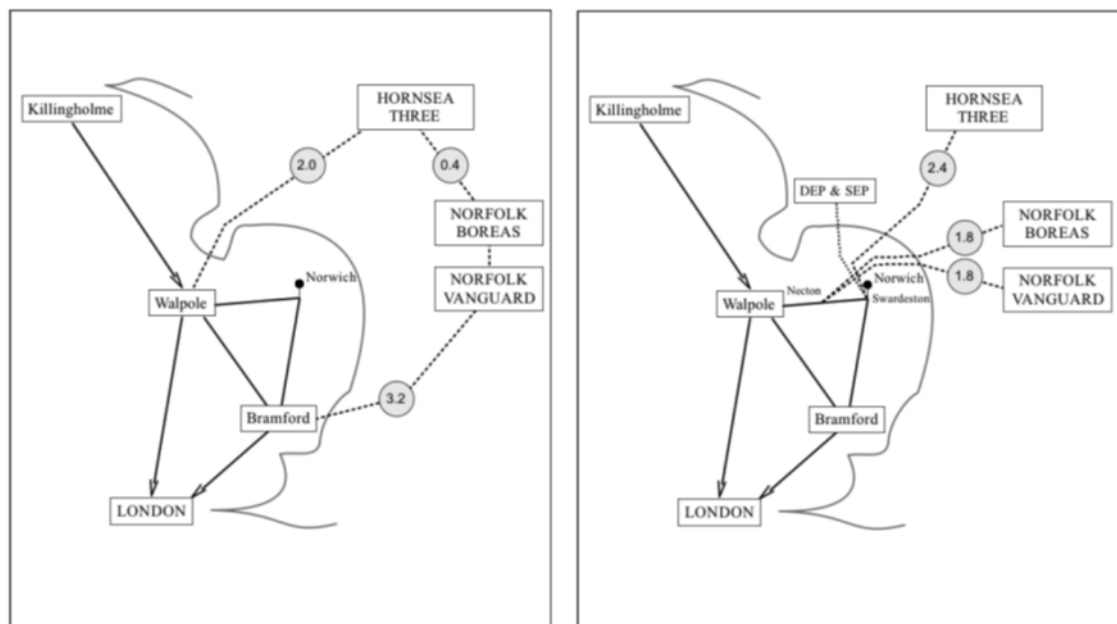


Figure 1: Direct connections

Figure 2: Crossed connections

- 5.15.13. National Grid states that the Crown Estate's announcement of Round 4 seabed leasing and Government's commitment to achieving Net Zero by 2050, mean that the future growth of offshore wind would require innovative and potential offshore solutions. It mentions that whilst Round 3 OWFs, including the Proposed Development, would proceed with radial connections, National Grid is continuing to work to find the best solution

for delivering this vital OWF infrastructure which may include an ORM (“*offshore transmission network*” in BEIS terminology). It adds that this would require a different policy framework to facilitate investment ahead of confirmed development [REP3-019, Q7.0.4].

- 5.15.14. The Applicant states that given the advanced stage in the consenting process for the Proposed Development and Norfolk Vanguard OWF, it must work within the constraints of the current regulatory framework, and at present there is no policy requirement to coordinated offshore development in the NPSs. The Applicant highlights that National Grid had co-ordinated a study with OWF operators to consider interconnections between OWF zones, which had concluded that systemic solutions would need to consider: the regulatory framework, technical and deliverable (financial) considerations and consenting. The necessary steps required to consider an alternative grid connection is an exploratory workstream at an early stage and would require new grid connection agreements, new offshore surveys, a new EIA and NSIP process, which would effectively delay the Proposed Development to the late 2020s to early 2030s [AS-024, Table 28, No.3], [REP5-045, Q2.7.0.1], [REP7-017, Q3.7.0.1] and [REP14-036].
- 5.15.15. The ExA acknowledges the representations from IPs advocating an ORM, particularly in view of the number of OWF projects coming forward in this region. The cumulative and sequential onshore adverse effects of the OWF coming forward in this region have been discussed in several Sections of this Recommendation Report and summarised in Section 5.22. However, the ExA considers that an ORM is not an alternative which can be considered within this Examination.

Substation location – connection offer from National Grid

- 5.15.16. The Applicant explains that the identification of the Proposed Development connection point to the National Electricity Transmission System (NETS) was undertaken with National Grid on the basis of several criteria, including the ability to accommodate the infrastructure for Norfolk Vanguard OWF and Proposed Development on the same connection site [APP-217, Section 4.8] and [APP-539, Section 5.3]. Both parties agreed that the preferred location was at the site of the existing Necton National Grid 400kV substation [APP-217, para 52 to 53]. A connection offer has been accepted for Norfolk Vanguard OWF and the Proposed Development [APP-539, para 47].
- 5.15.17. Several IPs questioned the choice of connection point in RRs and Mulbarton Parish Council, in its objection to the Proposed Development, suggested that a solution it describes as “*simpler*”, would be to connect Hornsea Project Three OWF at Walpole, and Norfolk Vanguard OWF and the Proposed Development at Bramford (see Figures above). It suggests that it would be in the commercial interest of National Grid to ensure that an offshore transmission link is built between the two projects [REP14-049, Page 1]. The Applicant’s response refers to its strategic approach to grid connection and to the benefits of co-locating the substations for the Proposed Development with those of Norfolk Vanguard OWF in terms of

reducing cumulative adverse effects (under Scenario 1) [AS-080, Point 1.1].

- 5.15.18. NSAG argued that onshore radial connections should not be necessary and comments on National Grid's earlier connection process that would have connected at Bacton and Lowestoft [REP13-040]. The Applicant had no comments to make on this [REP14-039, Point 1.9].
- 5.15.19. The ExA is satisfied that the case made for the connection point at Necton is sound, based on the detailed assessment which the Applicant undertook with National Grid. The ExA is satisfied that the Applicant has complied with the legal and policy requirements for considering alternatives in reaching its decision with National Grid to accept the connection offer at Necton (NPS EN-1, para 4.4.1 to 4.4.3).

Local Energy Distribution Network

- 5.15.20. The Applicant responded [AS-024] to NCC's suggestion regarding the potential for electricity generated from the Proposed Development to be used within the local distribution networks. The Applicant stated that there are no planning or regulatory mechanisms through which the Applicant could identify direct feeds into the regional distribution network in Norfolk, and that they are required to directly connect to the 400kV national transmission system [REP3-008, Page 8]. In response to ExA WQ1, National Grid confirmed that it is not aware of any precedent where an electricity supplier takes power direct from the Offshore Transmission Operators (OFTO), and that this would be a licensing matter, which National Grid could not address [REP3-019, Q5.4.2].
- 5.15.21. This is not a matter that the ExA can consider in the remit of this Examination, as it is outside the scope of the DCO. The ExA notes that NCC states that it will continue to work with Central Government regarding legislative changes to overcome obstacles to secondary inter-connection which would allow feeding into local transmission networks [REP3-008, Page 9].

Decommissioning

- 5.15.22. Decommissioning of the onshore project substation would be the same for Scenarios 1 and 2. The Applicant states that full EIA would be carried out ahead of any decommissioning works being undertaken, and would be in line with relevant policy and legislative requirements at that time. The programme for decommissioning would be similar in duration to the construction phase of 24 to 30 months. The detailed activities and methodology for decommissioning would include: dismantling and removal of electrical equipment, removal of cabling from site, removal of any building services equipment, demolition of the buildings and removal of fences, and landscaping and reinstatement of the site [APP-218, Section 5.6.3.8, 5.7.3.8].

Conclusions

- 5.15.23. The ExA received several representations throughout the Examination making the case for an alternative strategic solution to OWF grid connection which has been reported above. While the ExA has concluded such an alternative cannot be considered within this Examination, there are two points to which the ExA wishes to draw the SoS's attention:
- a. the expressed desire by IPs for legislative changes to overcome obstacles to secondary inter-connection which would allow feeding into local transmission networks; and
 - b. the demand for alternative means of grid connection (commonly referred to as an ORM), which would avoid cumulative, sequential onshore adverse effects arising from Associated Development such as radial cable corridors and substations.
- 5.15.24. The ExA is satisfied that the applicant has worked with National Grid to determine and secure the onshore connection point to the national transmission system. As such, the ExA can conclude that the Proposed Development would meet policy requirements of NPS EN-1 para 4.9.1, NPS EN-3 para 2.6.41 and NPS EN-5. The ExA concludes that matters relating to grid connection carry no weight for or against the making of the Order.

5.16. HERITAGE MATTERS AND ONSHORE ARCHAEOLOGY

Background and Policy Context

Introduction

- 5.16.1. Heritage matters and onshore archaeology was not identified as a principal issue in the ExA's initial assessment [PD-006]. Matters to do with offshore archaeology and heritage are reported in Section 5.18 of this Recommendation Report. A limited number of issues arose during the Examination which are reported below.

National Policy Statements

- 5.16.2. Overarching NPS for Energy EN-1(NPS EN-1) requires the applicant to provide a description of the significance of the heritage assets affected by the proposed development and the contribution of their setting to that significance. Where proposed development would affect the setting of a heritage asset, the applicant may need to provide representative visualisations (NPS EN-1, para 5.8.8 to 5.8.9).
- 5.16.3. The applicant should carry out appropriate desk-based assessments, supplemented by field evaluation if the former is insufficient to assess archaeological interest (NPS EN-1, para 5.8.9).
- 5.16.4. The applicant should ensure that the extent of the impact of the proposed development can be adequately understood from the application with supporting documents and that the level of detail required is proportionate to the importance of the heritage asset (NPS EN-1, para 5.8.8 to 5.8.10).

- 5.16.5. In reaching a decision the Secretary of State (SoS) should:
- a. seek to identify and assess the particular significance of any heritage asset that may be affected including the setting of the heritage asset (NPS EN-1, para 5.8.11);
 - b. take account of the particular nature of the significance of the heritage assets and the value they hold for this and future generations (NPS EN-1, para 5.8.12);
 - c. take into account the desirability of sustaining and enhancing the significance of heritage assets (NPS EN-1, para 5.8.13); and
 - d. presume in favour of conserving designated heritage assets with the greater the significance of the designated asset, the greater the presumption in favour of its conservation. (NPS EN-1, Para 5.8.14).

National Planning Policy Framework

- 5.16.6. The National Planning Policy Framework (NPPF) establishes that heritage assets should be conserved in a manner appropriate to their significance. Section 16 deals with conserving and enhancing the historic environment. It sets out the assessment requirements and consideration to be given to potential impacts, which chime with the policy position set out in NPS EN-1.

Other legislation

- 5.16.7. The legislation and guidance relevant to onshore archaeology and cultural heritage is set out in the ES Chapter 28 [APP-241, Section 28.2]. Regulation 3 of the Infrastructure Planning (Decisions) Regulations 2010 sets out requirements for the SoS in connection with listed buildings, which is explained by the Applicant [APP-241, para 21].

The application

- 5.16.8. The Applicant's Environmental Statement (ES) contains an assessment of onshore archaeology and cultural heritage for construction, operational and decommissioning stages in Chapter 28 [APP-241]. It is supported by Figures [APP-477] to [APP-483] and Appendices [APP-666] to [APP-676] including visualisations for cultural heritage specific viewpoints [APP-672]. Cumulative onshore archaeology and cultural heritage effects are covered in the onshore cumulative effects Chapter 33 [APP-246] and [APP-502].
- 5.16.9. The application includes a Schedule of Mitigation [APP-688], which was updated during the Examination [REP18-017]. In tabular form, this provides links from the construction, operational and decommissioning impacts assessed in the ES to the mitigation proposed and the means of securing the mitigation, such as via DCO requirements, securing an Archaeological Written Scheme of Investigation (WSI) and the Landscaping Management Scheme. Onshore Archaeology and Cultural Heritage is covered in Table 21.
- 5.16.10. An Outline Archaeological WSI, was submitted with the application [APP-696] and updated during the Examination [REP5-018] and is secured via

dDCO Requirement 23 (R23). This requires that a final version be submitted and approved by the relevant planning authority in consultation with Historic England (HBMCE) and Norfolk County Council (NCC). It includes a commitment to undertake additional programmes of survey and evaluation post-consent.

- 5.16.11. Embedded mitigation that is common across the project is set out in Section 5.1 of this Recommendation Report. The embedded mitigation measures specifically designed for onshore archaeology and cultural heritage which have been incorporated as part of the iterative design process are set out in the application [APP-241, Table 28.16]. These are:
- avoidance, micro-siting and route refinement; and
 - landscape screening and planting.
- 5.16.12. The Outline Landscape and Ecological Management Strategy (OLEMS) [APP-698], updated during the Examination [REP14-020] would form the basis for more detailed plans (Landscaping Management Scheme (LMS) and Ecological Management Plan (EcoMP)), which would be provided for approval post consent and would cover the replacement of hedgerows in a specific Hedgerow Mitigation Plan, developed in consultation with Natural England (NE), prior to hedgerow removal.

Local Impact Reports

- 5.16.13. Matters raised in Local Impact Reports (LIR) which are of relevance to onshore archaeology and heritage matters are précised here.

Broadland District Council

- 5.16.14. Broadland District Council (Broadland DC) points out that the western part of Cawston is a Conservation Area and a number of properties along the High Street are listed residential and commercial properties which are located in close proximity to the road which is proposed for use by HGVs [REP2-065, para 5.7].

North Norfolk District Council

- 5.16.15. NNDC considers that there would be some construction stage impacts to heritage assets and their settings, be of a temporary nature and that heritage impacts would all be on the 'less than substantial' scale. NNDC considers it is unlikely that the operational phase would result in unacceptable impacts. NNDC states, that in its view, the considerable public benefits associated with the windfarm would more than outweigh the 'less than substantial' harm to heritage assets within North Norfolk District [REP2-087, Section 12].

Issues

Blickling Estate and Blickling Conservation Area

- 5.16.16. The cable corridor would pass through part of the National Trust (NT) owned, Blickling Estate and Blickling Conservation Area. The adverse effects are assessed in the ES as not significant as they would be

temporary in nature. Mitigation would be achieved through sensitive management of duct installation works, strictly controlled backfilling and reinstatement returning field boundaries and hedgerows to their pre-construction condition [APP-241, para 214 to 215]. This is secured in the Outline Code of Construction Practice (OCoCP) [REP18-019] and the OLEMS [REP14-020]. The ExA notes that these points relate to Scenario 2, as this work would have been undertaken by the Norfolk Vanguard OWF in the case of Scenario 1.

- 5.16.17. At the start of the Examination, the NT raised a number of matters regarding the preservation by record, if excavation is necessary on its land [RR-084]. The Applicant confirmed commitment to a comprehensive programme of post-consent archaeological survey work which would take place across the relevant parts of the NT's Blickling Estate, in consultation with the NT and NCC. This is set out in the Outline WSI (OWSI) [AS-024, Table 1.23, No.1] and [REP5-018, Section 6.8].
- 5.16.18. The NT responded that it considered matters would be adequately dealt with as set out in the OWSI, as secured by R23 of the dDCO, and at the same time withdrew its objection [REP2-078] (See also Chapter 8 of this Recommendation Report on Compulsory Acquisition).

Cawston Conservation Area and listed buildings

- 5.16.19. Concerns were raised by Broadland DC, Cawston Parish Council (Cawston PC) and some Cawston residents from the outset in RRs, WRs and at the Open Floor Hearing on 13 November 2019 (OFH1). These centred on potential harm to listed buildings and adverse effects generally to the Cawston Conservation Area from traffic including heavy goods vehicles (HGV) that would use the High Street through the village during construction [REP2-047], [REP1-044], [AS-038], [REP1-063] and [EV4-001].
- 5.16.20. Broadland DC explained in response to WQ1 that outstanding details regarding the proposed highway intervention scheme (HIS) for Cawston were awaited, which could potentially result in adverse effects on the appearance and character of the Cawston Conservation Area, and on the setting of listed buildings through noise and vibration disturbance. Broadland DC noted this could be cumulative with Norfolk Vanguard and Hornsea Project Three OWFs [REP2-066, Q1.2.2, Q1.2.3].
- 5.16.21. Cawston PC felt that the cumulative impacts on listed buildings had not been adequately assessed as there was no agreed traffic management plan [REP2-067, Q1.2.2, Q1.2.3].
- 5.16.22. Requests were made from owners of listed buildings and buildings on High Street in the Conservation Area for the ExA to view inside and outside the properties on the ASI. The ExA viewed the exteriors and visited the interiors of three such properties on its ASI on 23 January 2020 (prior to Covid-19 social-distancing requirements). The ExA also walked the extent of High Street in the Conservation Area, where features of the revised HIS were pointed out [EV8-002]. Other unaccompanied ExA visits were made to Cawston [EV2-004].

- 5.16.23. The Applicant explained that the ES heritage assessment is focused on impacts and effects within the Order Limits, hence receptors in Cawston were not assessed [REP2-021, Q1.2.1]. However, as this matter was also raised during the Norfolk Vanguard OWF examination, further work had been undertaken in a Joint Position Statement with Broadland DC on the Cawston Conservation Area which was submitted for Norfolk Vanguard OWF examination and was included in the SoCG with Broadland DC for the Proposed Development [REP10-036, Appendix 2].
- 5.16.24. The Joint Position Statement related to the specifics of an earlier HIS, but principles such as minimising adverse effects on the character of the Conservation Area by adopting simple, unobtrusive and good quality, sympathetic material during detailed design would stand [REP10-036, Appendix 2, Section 1.2].
- 5.16.25. At the end of the Examination, Cawston PC disagreed with the findings of the Applicant's Clarification Note on potential noise, vibration and air quality effects of the HIS, which concluded that predicted effects of noise and vibration on buildings (including listed buildings) would both be minor adverse and effects on air quality would be negligible [REP8-028] and [REP10-046, Q4.1.2.2].
- 5.16.26. In its final SoCG with the Applicant, Broadland DC stated that on the basis of the HIS (which it understands to be agreed with NCC) and that the majority of the measures would be temporary in nature, Broadland DC considered that the adverse effects on the designated heritage assets in Cawston would be less than substantial and that the public benefits of providing renewable energy through a nationally significant project would weigh in its favour [REP10-036, Table 6, Page 23].
- 5.16.27. Matters of detailed design such as materials, final appearance, location of signage of components of the HIS would be subject to post consent approvals by Broadland DC in consultation with NCC. The Traffic Management Plan (TMP), which is secured through dDCO R21 provides the mechanism for approvals [REP10-036, Appendix 2]. More detailed consideration of the HIS has been reported in Section 5.2 of this Recommendation Report under Traffic and Transport.
- 5.16.28. The Norfolk Vanguard Joint Position commitments contained in the SoCG with Broadland DC for the Proposed Development would form the basis for design development should Scenario 2 be progressed and for removal and reinstatement of the HIS works in the case of Scenario 1.

Cumulative

- 5.16.29. In the final SoCG between the Applicant and Broadland DC, it was agreed by both parties that cumulative impacts on above ground cultural heritage are likely to be non-significant in EIA terms [REP10-036, Table 6, Page 23]. HBMCE agreed with the Applicant that an appropriate assessment of cumulative effects of both scenarios was presented [REP9-022, Table 3, Page 16]. It was also agreed between the Applicant and NCC that the assessment of cumulative impact was appropriate and that

the proposed mitigation would result in non-significant impacts [REP16-012, Table 7, Page 41].

- 5.16.30. In considering potential cumulative effects in Scenario 1 with Norfolk Vanguard OWF, the Applicant highlighted that the strategic approach, which is part of the embedded mitigation would help to ensure that impacts would be minimised as far as possible [APP-241, para 311]. Also, under Scenario 1, in assessing the operational indirect effect on the setting of the Church of St. Andrew Bradenham, the Applicant suggested that the slight visibility of the two onshore project substations could be further reduced by additional mitigation planting, such as hedgerow bolstering and tree planting, beyond the on-site landscape screening. It is stated this would be considered during the post-consent stage [APP-241, para 329]. There is no mechanism for securing this. The ExA visited the heritage viewpoint (CH1) at this location unaccompanied [EV2-004].

Decommissioning

- 5.16.31. The detail and scope of the onshore decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning, agreed with the regulator and a decommissioning plan would be provided. As such, for the purposes of a worst case scenario, impacts as for the construction phase have been assumed [APP-241, Section 28.7.7]. This is covered in the Schedule of Mitigation [REP18-017, Table 21, Ref 21.8].

Conclusions

- 5.16.32. As required by Regulation 3 of the Infrastructure Planning (Decisions) Regulations 2010, the ExA has given specific consideration to the desirability of preserving listed buildings and scheduled monuments or their setting or any features of special architectural or historic interest which they possess, and the desirability of preserving or enhancing the character or appearance of conservation areas.
- 5.16.33. The ExA considers that policy on the historic environment within NPS EN-1 has been followed by the Applicant. This policy is consistent with the aims of Section 16 of the NPPF and with the aims of the relevant policies of the local authorities' development plans.
- 5.16.34. The ExA considers that a description of heritage assets has been provided in a level of detail proportionate to the importance of the heritage assets (NPS EN-1, para 5.8.8). The ExA also considers that the significance of impacts on the onshore archaeological and cultural heritage has been assessed for construction, operational and decommissioning phases of the Proposed Development adequately, and that the addition of the Joint Position Statement on Cawston Conservation Area would ensure that the extent of the impact of the Proposed Development can be adequately understood (NPS EN-1, para 5.8.10).
- 5.16.35. The ExA agrees with the findings of the Applicant's ES, that the significance of any adverse effects would be reduced or offset to levels

considered non-significant in EIA terms following mitigation. The ExA is content that the TMP, secured by rDCO R21, the HIS and the Joint Position Statement on Cawston Conservation Area would provide adequate criteria on which to base the final designed HIS for implementation in Scenario 2 and for removal in Scenario 1. The ExA is content that the WSI provides the means by which recording would be secured and published (NPS EN-1, para 5.8.19 to 5.8.21). The ExA is content that the suggested off-site additional mitigation planting would count as enhancement, not mitigation, and is not required to address significant adverse effects on the setting of the Church of St. Andrew Bradenham.

- 5.16.36. Taking all these matters into consideration the ExA concludes that onshore archaeology and cultural heritage matters do not weigh against the Order being made.

5.17. NAVIGATION AND SHIPPING

Background and policy context

Introduction

- 5.17.1. This section considers the effects of the Proposed Development on navigation and safety of:
- a. commercial shipping;
 - b. fishing craft;
 - c. recreational boating; and
 - d. marine search and rescue operations.
- 5.17.2. The ExA's initial assessment, as reported in the ExA's Rule 6 letter [PD-006], identified Navigation and Shipping among the principal issues.
- 5.17.3. Effects on radar for maritime navigation and Search and Rescue in the vicinity of the Proposed Development offshore are both discussed in this section below, but other effects on Aviation and Radar are covered in Section 5.13 of this Recommendation Report. Effects on other infrastructure offshore are covered in Section 5.19 and effects on safety of commercial fishing operations are covered in greater detail in Section 5.11 of this Recommendation Report.

National Policy Statements

- 5.17.4. The Overarching National Policy Statement for Energy (NPS EN-1) and the National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) provide the primary basis for decision making on applications for nationally significant renewable energy infrastructure.
- 5.17.5. In relation to Navigation and Shipping, Section 2.6 in NPS EN-3 requires an applicant to engage early with the Maritime and Coastguard Agency (MCA) and other maritime stakeholders and to undertake a Navigational Risk Assessment in consultation with them including consideration of the

potential effect of proposed development on recreational navigation (NPS EN-3, paras 2.6.153 to 2.6.160).

5.17.6. In reaching a decision the Secretary of State (SoS) should:

- a. refuse consent if the Proposed Development is likely to interfere with recognised sea lanes essential to international navigation (NPS EN-3, para 2.6.161).
- b. be satisfied that site selection has been made with a view to minimising disruption to navigation and shipping (NPS EN-3, para 2.6.162).
- c. be satisfied that the Applicant has minimised any negative impacts to shipping routes to as low as reasonably practicable (ALARP) (NPS EN-3, para 2.6.163).
- d. if consent is granted, include a requirement that a detailed Search and Rescue Response Assessment should be undertaken prior to construction (NPS EN-3, para 2.6.164).
- e. refuse consent if unacceptable risks to navigational safety remain after all possible mitigation measures have been considered (NPS EN-3, para 2.6.165).
- f. be satisfied that the Proposed Development is designed to minimise effects on recreational craft (NPS EN-3, para 2.6.166).
- g. have regard to any obstruction of or danger to navigation which is likely to be caused by the Proposed Development in the context of the whole development and any cumulative effects of other relevant OWFs (NPS EN-3, paras 2.6.168 and 169).

Marine policy

5.17.7. The SoS must have regard to the appropriate marine policy documents, as provided for in the Marine and Coastal Access Act 2009 (MCAA2009). MCAA 2009, Part 4, Section 69, sub-section (1)(c) (MCAA2009) which provides for marine licence decisions to *"have regard to the need to prevent interference with legitimate uses of the sea"*.

5.17.8. Section 104(2) (aa) of the Planning Act 2008 (PA2008) identifies that the UK Marine Policy Statement (MPS) needs to be taken into consideration when determining the application. The MPS notes that decision makers should consider any negative impacts on shipping activity, freedom of navigation and navigational safety as well as taking account of environmental, social and economic effects and compliance with international maritime law. The MPS is the framework for preparing Marine Plans and the East Inshore and East Offshore Marine Plans cover the area in which the Proposed Development is situated. Relevant policies for this Proposed Development include:

- a. PS1 and PS2 in relation to under-keel clearance in important or International Maritime Organisation (IMO) designated shipping routes; and impacts upon safe navigation in-combination with other existing and proposed activities;
- b. PS3 regarding interference to current and future operations of ports and harbours;
- c. DD1 in regard to impact on dredging and disposal activities; and

- d. AGG1 and AGG2 in regard to aggregate resources; and CAB1 in relation to cable burial and protection.

Other relevant legislation and guidance

- 5.17.9. International maritime safety is governed by the IMO Safety of Life At Sea (SOLAS) Convention Chapter V (Safety of Navigation) 1974 (as amended). In addition to SOLAS, Navigational Risk Assessment (NRA) and safety provisions in connection with OWFs need to have regard to:
 - a. International Regulations for Preventing Collisions at Sea (COLREGS), IMO 1972;
 - b. Marine Guidance Note MGN 543 (M+F) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response. MCA 2016.
- 5.17.10. MGN 543, issued by the Maritime and Coastguard Agency (MCA), is relevant and important to the decision-making process for OREIs. Whilst not mandatory, failure to accept the MGN 543 guidance may result in an adverse recommendation from the MCA to the SoS and the MMO regarding the consenting and marine licensing process. It provides important guidance to developers and operators on:
 - a. structural layout;
 - b. navigation, collision avoidance and communications;
 - c. OWF boundary distances from shipping routes;
 - d. recommended safety and mitigation measures for OREIs during construction, operation and decommissioning; and
 - e. search and rescue and emergency response considerations.
- 5.17.11. MGN 543 makes reference to SI 2007 No 1948 “*The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007*” which contains provisions for the establishment of safety zones during construction, extension, operation, maintenance and decommissioning of OREIs.
- 5.17.12. The Infrastructure Planning (Decisions) Regulations 2010 have relevance for decisions on Deemed Marine Licences (DMLs) under the PA2008 with special reference to reg. 3A requirement to prevent interference with legitimate uses of the sea and to limit the increase of navigation risk to ALARP.
- 5.17.13. Other key legislation and policy are identified in Chapter 3 of this Recommendation Report.

The application

Environmental Statement and Navigational Risk Assessment

- 5.17.14. The Applicant’s Environmental Statement (ES) contains an assessment of potential impacts on Navigation and Shipping in ES Volume 1 Chapter 15: Shipping and Navigation [APP-228]. This chapter is supported by a number of appendices that contain figures, technical reports and details

of surveys and data collection, in particular the NRA [APP-569] and the Outline Marine Traffic Monitoring Strategy [APP-709].

- 5.17.15. Potential effects on recreational craft are covered at Sections 15.7 and 15.8 [APP-228]. Recognised sea lanes essential to international navigation and other offshore operational infrastructure are addressed in Section 15.6.1 [APP-228]. Site selection in relation to existing navigation and shipping activity and routes, potential impact of the Proposed Development and cumulative impacts are addressed in ES Chapter 15 [APP-228, Sections 15.6 and 15.7].
- 5.17.16. The application includes a Schedule of Mitigation [APP-688], which was updated during the Examination [REP18-017]. The Applicant has proposed two types of mitigation to minimise adverse effects on Navigation and Shipping:
- a. embedded mitigation which is secured through the design of the proposed development and through the following plans all secured under the DMLs in the dDCO:
 - i. the outline Project Environmental Management Plan (PEMP) [APP-705];
 - ii. the outline Scour Protection and Cable Protection Plan [APP-707]; and
 - iii. the Offshore In-principle Monitoring Plan [APP-703]; and
 - b. additional mitigation, described in ES Chapter 15 [APP-228, Section 15.7 and Table 15.16], proposed by the Applicant during the EIA process to reduce or eliminate any predicted significant impacts as detailed in the Schedule of Mitigation [REP18-017] and secured through various control documents and DML conditions under the dDCO.
- 5.17.17. Embedded mitigation in relation to navigation and shipping includes the following [APP-228, para 85 and Table 15.10]:
- a. safety zones around structures during construction and maintenance and use of guard vessels according to risk assessment;
 - b. pre-construction risk assessment of cable burial and protection including consideration of under keel clearance;
 - c. compliance with Design Rules agreed with the MCA and Trinity House (TH) as a framework for post-consent layout approval, including lines of orientation and 500m. Search-and-Rescue (SAR) access lanes;
 - d. all vessels associated with the Proposed Development to comply with COLREGS and SOLAS;
 - e. lighting and marking of the Proposed Development to be finalised in consultation with the MCA and TH;
 - f. alignment of Wind Turbine Generators (WTGs) with the adjacent Deep-Water Route;
 - g. foundation designs to be risk assessed for impact on navigation in compliance with MGN 543; and

- h. promulgation of information to mariners and marine traffic coordination.

- 5.17.18. No impacts were assessed in the ES as significant in EIA terms [APP-228, Section 15.7]. The NRA concludes that increased vessel to vessel collision risk and adverse effects on Emergency Response Resources are assessed as 'Tolerable'; and the risk of fishing vessel collision with structures during operation is assessed as 'Tolerable with mitigation' and therefore not significant in EIA terms. The ExA acknowledges that the terminology used for rating significance of effects differs between NRA and EIA.
- 5.17.19. Additional mitigation for vessel displacement and increased collision risk as detailed in Section 15.7 of ES Chapter 15 would be through management of traffic associated with the Proposed Development and its operations, maintenance and decommissioning and for effects on emergency response resources would be through emergency response planning and cooperation procedures.

Issues

- 5.17.20. Most of the issues examined by the ExA are related to the NRA carried out by the Applicant. The SoCG with the MCA agreed that the NRA was in accordance with the requirements and recommendations of MGN 543 and the MCA 2015 methodology for assessing marine navigational risk together with the IMO Formal Safety Assessment 2002 guidelines [REP9-024].
- 5.17.21. At the request of the MCA an Outline Marine Traffic Monitoring Strategy was produced by the Applicant to enable agreement with the MCA post-consent for the use of marine traffic monitoring to ensure that the NRA remains accurate throughout the construction and operational phases of the Proposed Development [APP-709]. The ExA is content that this strategy would be a certified document within the rDCO [REP18-009 Schedule 18 Part 2].
- 5.17.22. The following specific issues were examined relating to mitigation of the impact of Proposed Development on Navigation and Shipping:
 - a. effects on fishing vessels in relation to safety zones;
 - b. cable protection exceeding 5% of navigable depth;
 - c. notification time periods;
 - d. swath bathymetry;
 - e. Emergency Response Cooperation Plan;
 - f. lines of orientation of WTGs;

Effects on fishing vessels in relation to safety zones

- 5.17.23. In the SoCG with NFFO/VisNed the parties agreed that satisfactory mitigation for effects on fishing vessels in relation to safety zones would be achieved by appropriate communication made to the fishing industry in advance of initiating construction safety zones, provisions for which would be defined in the Fisheries Liaison and Co-existence Plan (FLCP) [REP9-025]. The ExA is therefore satisfied that the FLCP is secured as a daughter plan of the Project Environmental Management Plan through

rDCO Schedules 9 & 10 Part 4 condition 14(1)(d)(v), Schedules 11 & 12 Part 4 condition 9(1)(d)(v) and Schedule 13 Part 4 condition 7(1)(d)(v) [REP18-009]. The effects of safety zones during major maintenance by Service Offshore Vessels (SOVs) is discussed in greater detail in Section 5.11 (Commercial Fisheries and Fishing) of this Recommendation Report.

Cable protection exceeding 5% of navigable depth

- 5.17.24. TH had concerns regarding cable protection that could create significant navigational hazard if exceeding 5% of navigable water depth. TH sustained to the end of the Examination its request for specific wording to be added to the DML conditions to ensure consultation with the MCA and TH to secure steps to be taken to ensure safe navigation if any cable protection is identified exceeding 5% in clearance depth [REP8-034].
- 5.17.25. The Applicant resisted TH's proposed change of DML wording, arguing that TH pre-construction involvement in agreeing cable details is already secured by the DML in relation to MMO approval of the design plan [REP9-025]. The Applicant confirmed that this consultation requirement with the relevant authorities is secured by the cable specification, installation, and monitoring plan (CSIMP) [REP9-025] that would be agreed post-consent with the MMO in consultation with the MCA and TH and that would incorporate a risk-based approach to the management of unburied or shallow-buried cable, together with a detailed cable laying plan. The CSIMP is secured through dDCO Schedules 9 & 10 Part 4 condition 14(1)(g), Schedules 11 & 12 Part 4 condition 9(1)(g) and Schedule 13 Part 4 condition 7(1)(f) [REP18-009].
- 5.17.26. TH's sustained request for additional specific wording in the DML conditions (to secure steps to be taken to ensure safe navigation if any cable protection is identified exceeding 5% of navigable depth) is supported by the MCA who expressed that it is cautious of relying on the pre-construction condition in MGN 543 for the purpose of notifying water depth reduction, as it may be missed by the development team, and emphasised the requirement of the MCA and TH for a *"detailed cable laying plan of the Order limits, incorporating a burial risk assessment encompassing the identification of any cable protection that exceeds 5% of navigable depth referenced to chart datum and, in the event that any area of cable protection exceeding 5% of navigable depth is identified, details of any steps (to be determined following consultation with the MCA and Trinity House) to be taken to ensure existing and future safe navigation is not compromised or such similar assessment to ascertain suitable burial depths and cable laying techniques, including cable protection."* [REP9-024].
- 5.17.27. The Applicant's argument that the wording of the DMLs for this Proposed Development regarding cable laying, protection and consultation with the relevant authorities should remain consistent with the Norfolk Vanguard made DCO in order to avoid potential confusion between the two closely associated projects as the cable laying for the two developments may or may not be undertaken at different times and by different contractors [REP9-024]. The ExA does not agree with the Applicant in this particular

respect and agrees with the MCA that it is unsafe to rely on interpretation of the MGN 543 guidance and on the intentions of the CSIMP.

- 5.17.28. Therefore, the ExA recommends an amendment to be made in the rDCO of Schedules 9 & 10 Part 4 condition 14(1)(g), Schedules 11 & 12 Part 4 condition 9(1)(g) and Schedule 13 Part 4 condition 7(1)(f) to incorporate additional wording proposed by TH [REP8-034].
- 5.17.29. This issue is also referenced in Section 5.11 of this Recommendation Report (Fishing & Fisheries).

Notification time periods

- 5.17.30. There was disagreement between the MCA and the Applicant whether 10 days or 14 days period for notification to the UK Hydrographic Office of commencement and completion of works would be sufficient. By the end of the Examination the Applicant and the MCA had reached agreement on amending DML conditions such that the notification period would be 10 days and would include the word 'prior' in regard to notice of commencement [REP9-024]. The ExA is satisfied that this change has been incorporated in the dDCO (Schedules 9 & 10 Part 4 conditions 9 (8) and (10), Schedules 11 & 12 Part 4 condition 4 (8) and (10), and Schedule 13 Part 4 condition 3 (8) and (10) and considers the issue to be resolved.

Swath bathymetry conditions

- 5.17.31. The MCA had concerns over security in the DMLs for the extent, timing and specification of swath bathymetry survey and provision of information pre-and post-construction. By the end of the Examination the Applicant and the MCA reached agreement that the wording of DML conditions covering pre-and post-construction swath bathymetry surveys would remain the same for both the Proposed Development and the Norfolk Boreas OWF project [REP9-024].
- 5.17.32. The ExA is therefore satisfied that this matter is resolved and dDCO Schedules 9 & 10 Part 4 condition 18, Schedules 11 & 12 Part 4 condition 13, and Schedule 13 Part 4 condition 11 secure timely provision to the MCA of pre-construction hydrographic data to the required standard "*in accordance with the agreed timetable*". The ExA is also satisfied that dDCO Schedules 9 & 10 Part 4 condition 16; Schedules 11 & 12 Part 4 condition 11; and Schedule 13 Part 4 condition 9 adequately secure the provision of post-construction hydrographic survey data and that the above DML conditions in the rDCO provide security that details for proposed surveys would have received prior written approval by the MMO in consultation with the relevant statutory bodies.

Emergency Response Cooperation Plan

- 5.17.33. The MCA sought clarification of DML conditions to secure timely production of an Emergency Response Cooperation Plan (ERCoP). By the end of the Examination the MCA agreed with the Applicant revised wording to the DML conditions consistent with the Norfolk Vanguard OWF made DCO requiring pre-commencement agreement in writing from the

MMO, in consultation with the MCA of compliance with the requirements of MGN 543 and its annexes [REP9-024]. The ExA is content that dDCO Schedules 9 & 10 Part 4 condition 15 and Schedules 11 & 12 Part 4 condition 10 and Schedule 13 Part 4 condition 8 contain the agreed wording and thereby secure the timely provision of an ERCoP.

Lines of orientation of WTGs

- 5.17.34. The MCA noted that the NRA submitted by the Applicant assesses only one 'line of orientation' of WTGs and expressed a preference that every endeavour should be made in the final layout design to adopt at least two 'lines of orientation' as recommended in their MGN 543 guidance, accepting that there may be scope to consider justification which demonstrates why a single line of orientation may be acceptable from the safety of navigation and Search and Rescue perspective [REP2-092].
- 5.17.35. The SoCG with the MCA agreed that the final turbine layout design would be agreed in writing post-consent with the MMO in consultation with MCA and TH to minimise risks to surface vessels and SAR aircraft operating within the site [REP9-024]. On that basis the ExA is satisfied that this issue could be appropriately managed post-consent and that this final layout (Design Plan) is secured by rDCO Schedules 9 & 10 Part 4 condition 14(1)(a); and that this post-consent regulatory approval would appropriately ensure that the layout design would minimise effects on recreational craft as required by NPS EN-3 (para 2.6.166).

Cumulative impacts

- 5.17.36. The following cumulative impacts are assessed in ES Chapter 15 as 'Tolerable and therefore not significant under EIA terms' [APP-228 section 15.8]:
- a. Vessel displacement (route deviation);
 - b. Restriction of Adverse Weather Routing;
 - c. Increased vessel/vessel collision risk;
 - d. Increased vessel /structure allision risk; and
 - e. Effects on Emergency Response Resources.
- 5.17.37. The Applicant's assessment [APP-228 Section 15.8.1 and Table 15.16] identified that cumulative transboundary impacts could arise from effects of the Proposed Development upon commercial shipping transiting between the UK and other EEA ports; some route deviations were identified but found to have "*no perceptible impacts*" on ports and that amounts of displacement/deviation (including restriction of adverse weather routing) were assessed as Tolerable and therefore not significant in EIA terms.

Conclusions

- 5.17.38. Having examined the application, the ES and the issues discussed above in accordance with NPS EN-3 Section 2.6 the ExA concludes that:
- a. in accordance with NPS EN-3, paras 2.6.156 to 159 and 2.6.164 to 167 a NRA has been carried out appropriately in consultation with

appropriate navigational stakeholders, including assessment of worst-case effects of safety zones and effects on recreational navigation;

- b. in accordance with NPS EN-3, paras 2.6.161, 2.6.162 and 2.6.163, site selection and configuration has been made with a view to minimising disruption to navigation and shipping and avoidance of interference with international sea lanes and any negative impacts to shipping routes are minimised to ALARP.
- c. in accordance with NPS EN-3, 2.6.164 a Search and Rescue Response Assessment identifying lines of orientation of WTGs would be a part of post-consent approval prior to construction of the final design layout (Design Plan) secured by the DMLs under rDCO Schedules 9 & 10 Part 4 Condition 14(1)(a);
- d. in accordance with NPS EN-3, paras 2.6.165 to 169, the ExA accepts the Applicant's assessment that the Proposed Development as a project alone or cumulatively with other relevant OWFs would not have an unacceptable adverse impact on shipping and navigational safety after mitigation; and the ExA therefore concludes that Navigation and Shipping matters do not weigh against the Order being made; and
- e. in accordance with the MCAA 2009 the ExA is satisfied that the Applicant has had due regard to the need to prevent interference with legitimate uses of the sea. The ExA is also satisfied that there would be no unacceptable negative impacts on shipping activity, freedom of navigation and navigational safety in accordance with environmental, social and economic marine policies and in compliance with international maritime law.

5.17.39. The ExA therefore concludes that navigation and shipping matters do not weigh against the Order being made.

Draft DCO

5.17.40. rDCO Schedules 9 & 10 condition 14(1)(g), Schedules 11 & 12 condition 9(1)(g) and Schedule 13 condition 7(1)(f) have been amended to incorporate additional wording requested by TH to secure steps to be taken to ensure safe navigation if any cable protection is identified exceeding 5% of navigable depth [REP8-034].

5.17.41. In making these changes to the rDCO, the ExA can confirm that if the SoS disagrees with this addition, there would be no concomitant changes necessary if the SoS were to adopt the Applicant's final dDCO drafting.

5.18. OFFSHORE ARCHAEOLOGY AND HERITAGE ASSETS

Background and policy context

Introduction

5.18.1. This section considers the impact of the Proposed Development on intertidal and offshore archaeology and cultural heritage, which was not identified as a principal issue in the ExA's Rule 6 letter [PD-006].

Onshore archaeology is covered in Section 5.16 of this Recommendation Report.

National Policy Statements

- 5.18.2. The Overarching National Policy Statement for Energy (NPS EN-1) and the National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) provide the primary basis for decision making on applications for nationally significant renewable energy infrastructure.
- 5.18.3. Section 5.8 in NPS EN-1 includes the following key considerations in relation to the historic environment generally:
- a. As part of the ES the Applicant should describe the significance of heritage assets and likely archaeological features that may be affected by the Proposed Development and the likely extent of impact of the Proposed Development on them (NPS EN-1, paras 5.8.8, 5.8.9 and 5.8.10).
 - b. The SoS must take account of the "*particular significance*" of heritage assets affected by Proposed Development and the value that they hold for future generations on the basis of evidence and expert advice available (NPS EN-1, paras 5.8.11 and 5.8.12).
 - c. Any harmful impact on the significance of a designated heritage asset should be weighed against the public benefit of development. Where loss of significance of any heritage asset is justified on the merits of the development proposed, the SoS should consider imposing a condition or requirement for the applicant to enter into an obligation that will prevent such loss occurring until it is reasonably certain that the relevant part of the development is to proceed (NPS EN-1 paras 5.18.15 and 5.8.17).
 - d. There should be a presumption in favour of the conservation of designated heritage assets proportionate to their significance; substantial harm to or loss of designated assets of the highest significance, including Scheduled Monuments, should be wholly exceptional (NPS EN-1, para 5.8.14).
 - e. Where loss of significance of any heritage asset is justified on the merits of the development proposed the SoS should require the developer to record and advance understanding of the significance of a heritage asset before it is lost, proportionate to the degree of significance of the asset (NPS EN-1, para 5.8.20).
 - f. Where such recording and publication is required the SoS should impose requirements that such work is carried out in a timely manner in accordance with an agreed and secured written scheme of investigation (NPS EN-1, para 5.8.21).
 - g. Where the SoS considers there is a high probability of as-yet undiscovered assets, the SoS should consider requirements to secure appropriate identification and treatment of such assets discovered during construction (NPS EN-1, para 5.8.22).
- 5.18.4. The NPS for Renewable Energy Infrastructure EN-3 requires the applicant to identify any beneficial effects on the historic marine environment, for example through improved access or the contribution to new knowledge that arises from investigation (NPS EN-3, para 2.6.142).

- 5.18.5. NPS EN-3 requires the SoS, with regard to the offshore historic environment, to:
- a. be satisfied that the design of an offshore wind farm and associated infrastructure has considered known heritage assets and their status, notably designated Protected Wrecks (NPS EN-3, para 2.6.144).
 - b. consider granting consent that allows for micro-siting to allow for circumstances such as the discovery of marine archaeological assets (NPS EN-3, para 2.6.146).

Other policy and legislation

- 5.18.6. The legislation and guidance relevant to offshore archaeology and cultural heritage is set out in the ES Chapter 17 [APP-230, Section 17.2]. Key legislation and policy are identified in Chapter 3 of the ES [APP-216]. The Applicant's Planning Statement sets out the national, regional and local planning policies that are considered relevant to the Proposed Development [APP-693].
- 5.18.7. In addition to this NPS the Decision Maker must have regard to the appropriate marine policy documents, as provided for in the Marine and Coastal Access Act 2009 (MCAA2009). The UK Marine Policy Statement (MPS) is the framework for preparing Marine Plans and the East Inshore and East Offshore Marine Plans cover the area in which the Proposed Development is situated. Policy SOC2 applies to protect offshore and intertidal heritage assets.
- 5.18.8. The MPS (para 2.6.6.5) states that some heritage assets with archaeological interest that are not currently designated as scheduled monuments or protected wreck sites but are "*demonstrably of equivalent significance*" should be considered as subject to the same policy principles as designated heritage assets "*based on information and advice from the relevant regulator and advisors*".
- 5.18.9. Relevant legislation for heritage assets offshore includes:
- a. The Ancient Monuments and Archaeological Areas Act 1979 (as amended by the National Heritage Acts 1983 and 2002) which protects scheduled monuments that may be sites that include the remains of vessels or aircraft.
 - b. The Protection of Wrecks Act 1973 which provides protection for sites of wrecks designated for historical, archaeological or artistic value including provision for a restricted area around the wreck site.
 - c. The Protection of Military Remains Act 1986 which provides protection for the wreckage of military aircraft and designated military vessels.

The application

The Environmental Statement

- 5.18.10. The Environmental Statement (ES) contains an assessment of all offshore and intertidal designated heritage assets and their setting and features of potential archaeological interest and potential impacts of the Proposed Development in ES Chapter 17 [APP-230]. This is supported by appendices that contain figures, technical reports and details of consultation and data collection.
- 5.18.11. As the export cable corridor and part of the offshore project generator areas cover the same footprint as the Norfolk Vanguard OWF project, the data collected as part of the Norfolk Vanguard OWF project has been used by the Applicant to characterise the baseline to inform the EIA for this Proposed Development [APP-230]. This approach was agreed with the statutory body responsible for offshore and intertidal archaeology, the Historic Buildings and Monuments Commission for England (HBMCE, otherwise known as Historic England) and is confirmed in the SoCG [REP9-022].
- 5.18.12. The main offshore and intertidal archaeology and cultural heritage issues are potential impacts of the Proposed Development on:
- a. wreck sites and geophysical survey anomalies of unknown origin but potential archaeological interest; and
 - b. prehistoric subsea features and "*paleo-geoarchaeology*".
- 5.18.13. Seabed features of potential archaeological interest within the study area are summarised in ES Section 17.6.2 and Table 17.11 [APP-230] including geophysical survey anomalies of unknown origin which are categorised as follows:
- 'A1' ("*of archaeological interest*");
 - 'A2' ("*features/remains of uncertain origin of possible archaeological interest*"); and
 - 'A3' ("*previously recorded sites that have not been seen in the geophysical data*").

Mitigation

- 5.18.14. The application includes a Schedule of Mitigation [APP-688], which was updated during the Examination [REP18-017]. The Applicant has proposed two types of mitigation to minimise adverse effects on offshore archaeology and cultural heritage:
- a. embedded mitigation which is secured through the design of the proposed development and through an outline Written Scheme of Investigation (WSI): Archaeology and Cultural Heritage (Offshore) [APP-697 updated as REP5-020]; and an Offshore In-principle Monitoring Plan (IPMP) [REP14-027] both secured under the Deemed Marine Licences (DMLs) in the dDCO; and
 - b. additional mitigation which was adopted by the Applicant during the EIA process to reduce or eliminate any predicted significant impacts as detailed in the Schedule of Mitigation [REP18-017] and secured through various control documents and DML conditions under the dDCO.

- 5.18.15. Embedded mitigation in relation to offshore and intertidal archaeology and cultural heritage is detailed in the outline offshore WSI [APP-697] and includes:
- a. the application of Archaeological Exclusion Zones (AEZs) around known wreck sites and A1 and A3 anomalies;
 - b. avoidance of A2 and A3 anomalies by micro-siting where possible;
 - c. establishment of formal protocol and watching brief for reporting, recording and assessment of archaeological finds during pre-construction surveys, construction and operation phases;
 - d. the offshore WSI would be completed post-consent to be agreed with HBMCE and the MMO (as the discharging authority for the DML conditions including offshore WSIs).
- 5.18.16. Additional mitigation proposed is referenced in the outline WSI [APP-697] and includes further investigation and assessment of anomalies where avoidance by micro-siting is not possible, and further examination and archaeological assessment of potential prehistoric deposits of any further geophysical data. Finds would be reported using the established Protocol for Archaeological Discoveries: Offshore Renewables Projects (The Crown Estate, 2014).
- 5.18.17. Within the intertidal zone, all known assets such as the remains associated with the Happisburgh Low Lighthouse would be avoided by long Horizontal Directional Drilling (HDD) for the installation of cable ducts at landfall. This HDD would pass a minimum 10 metres and maximum 20 metres below the beach platform, therefore there would be no direct impact to shallow assets in the intertidal zone from the Proposed Development and the potential for encountering Palaeolithic archaeological material within this maximum 20m. depth is anticipated to be low [APP-230 paras 183 to 198]. The ExA notes that Requirement 17 of the dDCO states that works at the Landfall (4A, 4B and 4C) may not commence until a method statement is approved in writing by North Norfolk District Council.
- 5.18.18. The ES summarises residual potential direct and indirect impacts for offshore and intertidal archaeology after mitigation as no greater than minor adverse [APP-230 Table 17.23].

Cumulative impact assessment

- 5.18.19. ES Chapter 17 reports that cumulative direct impacts to known heritage assets are unlikely to occur due to the retention of AEZs throughout the life of constructed and planned projects [APP-230 Table 17.21]. Potential cumulative indirect impacts on heritage assets from additional sediment cover or increased scour is assessed as negligible as reported in the assessment of marine physical processes in Section 8.8 of Chapter 8 [APP-221].
- 5.18.20. The ES reports that there is potential for multiple unavoidable direct impacts from multiple projects to as-yet undiscovered heritage features, for example to "*paleo-landscapes*" or maritime and aviation wrecks,

which would be mitigated by agreed measures as part of the consenting process for each project [APP-230 Table 17.21].

- 5.18.21. After mitigation, the potential cumulative direct impacts to potential (unknown) heritage assets within the Order limits of the Proposed Development and the Norfolk Vanguard OWF as consented are assessed to be minor adverse; other infrastructure projects are non-overlapping and cumulative direct impacts are therefore not anticipated [APP-230 para 237].
- 5.18.22. The Applicant makes the case that the acquisition of data and records through investigation of heritage assets and chance discoveries during development would be a significant beneficial cumulative effect, subject to the completion of studies to professional archaeological standards and the results to be made publicly available [APP-230 para 241]. This data acquisition and sharing obligation is secured via the outline WSI (offshore) and the final WSI must be agreed with the MMO in consultation with HBMCE as secured through the DMLs (dDCO Schedules 9 & 10 Condition 14(1)(h), Schedules 11 & 12 Condition 9 (1)(h) and Schedule 13 Condition 7(1)(h)).

Potential transboundary impacts

- 5.18.23. The ES Chapter 17 notes that transboundary archaeological impacts may occur if unexpected discoveries of wrecks or aircraft of non-British nationality are made by the Proposed Development, but explains in mitigation that the likelihood of significant impacts occurring is reduced by the archaeological assessment of pre-construction geophysical survey data in combination with the implementation of the Protocol for Archaeological Discoveries: Offshore Renewables Projects (The Crown Estate, 2014) (ORPAD) [APP-230 Section 17.9].
- 5.18.24. Due to the implementation of AEZs, transboundary direct impacts to known wrecks and aircraft are not expected to occur, but there is potential for direct impacts to potential (unknown) transboundary heritage assets within the project limits of the Proposed Development that are assessed to be minor adverse after mitigation. The Applicant confirms that if maritime wrecks or aircraft of non-British nationality are discovered during the Proposed Development, further advice would be sought in their country of origin regarding the legal status of the remains [APP-230 Section 17.9]. This is secured via the outline WSI as a certified document in the rDCO and the final WSI must be agreed post-consent with MMO in consultation with HBMCE as secured through the DMLs (rDCO Schedules 9 & 10 Condition 14(1)(h), Schedules 11 & 12 Condition 9 (1)(h) and Schedule 13 Condition 7(1)(h)).
- 5.18.25. Transboundary effects are reported further in Section 5.20 of this Recommendation Report.

Inter-relationships and interactions

- 5.18.26. The ES Chapter 17 reports that no significant accumulation of impacts is expected on any single archaeological receptor due to inter-relationships

between offshore archaeology and marine physical processes, and the worst case impacts assessed take into account potential for synergistic impacts. [APP-230, Sections 17.10 and 17.11 and Table 17.22].

Decommissioning

- 5.18.27. The Applicant states that decommissioning of offshore infrastructure would be agreed with the relevant authorities in a timely manner prior to decommissioning; and that it is likely that all WTG components would be removed, foundations above seabed and all or some of the offshore cables removed; the Applicant states that impacts to offshore archaeology and heritage receptors would be similar to those for construction and are assessed as minor adverse after embedded mitigation, therefore not significant in EIA terms [APP-230, paras 224 to 227].

Local Impact Reports

- 5.18.28. Local Impact Reports only cover the intertidal zone above Mean Low Water at the proposed landfall site, where NNDC is the landowner. NNDC made no specific representation about archaeological heritage in the intertidal zone and defers to the advice of Norfolk County Council (NCC) [REP2-087].
- 5.18.29. NCC clarified that only the intertidal cultural heritage falls directly within the remit of the NCC Environment Service whilst all other offshore archaeology and cultural heritage lies within the remit of the MMO and HBMCE; however NCC is interested in the data acquired from offshore survey and recording [REP2-085].

Issues

- 5.18.30. The issues relating to offshore and intertidal archaeology and cultural heritage pursued during the Examination were:
- a. Archaeological data acquisition and management post-consent;
 - b. Protection for archaeology during pre-construction activities;
 - c. Investigation of subtidal zone at landfall; and
 - d. Increased AEZ for Scheduled Monuments offshore.
- 5.18.31. The ExA examined these issues with reference to the appropriate legislation and policies described in Chapter 3, through written questions and in an ISH on 22 January 2020 [EV7-001 to EV7-005].

Archaeological data acquisition and management post-consent

- 5.18.32. HBMCE sought clarifications from the Applicant regarding further details for timely archaeological investigations and deposit of records [REP2-072].
- 5.18.33. The Applicant clarified that the obligations about which HBMCE sought clarification would be provided for in the post-consent WSI in accordance with the outline offshore WSI and must be agreed with the MMO in consultation with HBMCE [REP3-007].

- 5.18.34. At ISH4 HBMCE confirmed satisfaction with the Applicant's clarifications [EV7-001 to EV7-005]. The outline offshore WSI was amended with clarification of process for obtaining written approval from the MMO after consultation with HBMCE [REP5-020]. This outline offshore WSI, which includes the intertidal zone, was subsequently agreed as acceptable in the SoCG with HBMCE [REP9-022].
- 5.18.35. HBMCE also requested that an explicit reference should be made in the IPMP Section 4.10 to the requirement to produce a survey-specific pre-commencement WSI [REP5-071]. The IPMP (which would be a certified document under Article 37 of the rDCO) was amended accordingly by the Applicant [REP14-027]. HBMCE subsequently confirmed (in its submission in lieu of attendance at ISH5) that it is satisfied by measures relevant to HBMCE as contained in the dDCO [EV9-004].
- 5.18.36. The ExA is therefore satisfied that archaeological data acquisition, assessment and data management obligations are adequately provided for in the outline WSI and the final WSI to be agreed post-consent with the MMO in consultation with HBMCE is secured via the outline offshore WSI as a certified document in the dDCO through the DMLs (rDCO Schedules 9 & 10 Condition 14(1)(h), Schedules 11 & 12 Condition 9 (1)(h) and Schedule 13 Condition 7(1)(h)).
- 5.18.37. The ExA is also satisfied that a specific WSI for pre-commencement offshore and intertidal surveys and archaeological investigation is secured in the rDCO through the DMLs Schedules 9 & 10 Condition 14(2); Schedules 11 & 12 Condition 9(2) and Schedule 13 Condition 7(2) and the IPMP which would be a certified document under Article 37 of the rDCO.

Micro-siting of export cables within the HHW SAC

- 5.18.38. The ExA sought clarification at ISH4 of the additional constraints on siting of cables caused by Archaeological Exclusion Zones (AEZs) in conjunction with constraints of natural habitat features within the HHW SAC. This was followed up with a hearing action note requesting a chart or map showing seabed features of archaeological interest overlaid on Annex 1 reef features with an explanatory note on how to optimise cable routing balancing archaeological constraints and conservation objectives [EV7-005]. In response the Applicant submitted a clarification note [REP4-022].
- 5.18.39. The MMO confirmed that as its duty is to protect as far as possible both habitat features and archaeological features, it would not envisage prioritising one of these over the other, hence its desire to seek confidence pre-consent regarding ability to micro-site cable installation [REP5-073].
- 5.18.40. In [REP6-014] the Applicant argued that the Proposed Development offshore cable corridor has been purposely designed to be wider (up to 4.7km) in areas of greater constraint. The MMO acknowledged this and deferred to NE in relation to HRA aspects of the siting of cables in the HHW SAC [REP7-040].

- 5.18.41. In [REP7-017] the Applicant further explained that in regard to archaeological and habitat constraints on micro-siting of cable route, only a proportion of A2 anomalies within the HHW SAC are likely to be confirmed as being of archaeological interest, with an even smaller number being given protection by AEZs; and in the event that an A2 anomaly could not be avoided, then other mitigation would be possible through the WSI. This has been agreed in principle in the SoCG with HBMCE [REP9-022].
- 5.18.42. The ExA is re-assured by the agreement in principle of the relevant authority (HBMCE) to the Applicant's proposals for micro-siting of cable installation in the HHW SAC.
- 5.18.43. The ExA is therefore satisfied with the Applicant's justification of proposed mitigation of risk of adverse effects on archaeological assets in the HHW SAC, recognising the additional cable corridor width and the post-consent design and approval process for avoidance of A2 anomalies (of which only some may be confirmed as being of archaeological interest needing AEZ protection) or alternative mitigation as secured through the WSI under the rDCO DMLs Schedules 9 & 10 Condition 14(1)(h), Schedules 11 & 12 Condition 9 (1)(h) and Schedule 13 Condition 7(1)(h) and therefore satisfies the NPS policy test (NPS EN-3, para 2.6.146).
- 5.18.44. Therefore, the ExA does not consider potential effects on archaeological features in the HHW SAC as a significant risk factor that would prevent the making of the Order. This is without prejudice to discussion of natural habitat aspects of micro-siting in the HHW SAC which is reported in detail in Section 5.9 Marine biodiversity etc. and Chapter 6 HRA of this Recommendation Report.

Investigation of subtidal zone at landfall

- 5.18.45. At ISH4 the ExA sought clarification of how micro-surveying of potential archaeological assets at the landfall HDD site prior to construction activities would be planned and executed and the implications (if any) on selection of horizontal drill method for cable duct installation [EV7-001 to EV7-005]. The proposed landfall method was elaborated by the Applicant in a clarification note, with particular reference to pre-commencement archaeological investigation to inform selection of the locations within the subtidal zone for the drill exits of landfall cable ducting [REP4-021].
- 5.18.46. HBMCE accepted the Applicant's proposal of micro-siting at the landfall HDD site in the subtidal zone to avoid anomalies or further investigation in accordance with an agreed WSI, if anomalies cannot be avoided [REP5-071].
- 5.18.47. The ExA is reassured by the agreement in principle of the relevant authority (HBMCE) to the Applicant's proposals for micro-siting of cable installation at the landfall HDD site in the subtidal zone and the ExA is satisfied with the Applicant's proposal for archaeological procedures to be elaborated in a WSI to be agreed post-consent with the relevant authorities and that the WSI is secured by the rDCO at Schedules 9 & 10

Condition 14(1)(h), Schedules 11 & 12 Condition 9 (1)(h) and Schedule 13 Condition 7(1)(h).

- 5.18.48. Therefore, the ExA does not consider potential effects on archaeological features in the subtidal zone at the landfall HDD site as a significant risk factor that would prevent the making of the Order.

Increased AEZ for Scheduled Monuments

- 5.18.49. In response to WQ1, HBMCE confirmed that both the steam paddle schooner 'Seagull' and the steam screw barque 'Xanthe' wrecks, lying within the export cable corridor, are now scheduled under the Ancient Monuments and Archaeological Areas Act 1979 [REP2-072, Q1.0.5]. The outline WSI (offshore) was subsequently amended to increase the AEZ for each of these two assets to a minimum of 100 metres [REP5-020]. HBMCE agreed that the nature and extent of Archaeological Exclusion Zones (AEZs) would be finalised and agreed in consultation with HBMCE prior to construction [REP9-022].
- 5.18.50. The ExA is satisfied that this mitigation of risk to archaeological assets is secured through the WSI under rDCO Schedules 9 & 10 Condition 14(1)(h), Schedules 11 & 12 Condition 9(1)(h) and Schedule 13 Condition 7(1)(h).
- 5.18.51. Therefore, the ExA does not consider potential effects on scheduled monument heritage wreck features as a significant risk factor that would prevent the making of the Order.

Conclusions

- 5.18.52. Having examined the application, the ES and the issues discussed above in accordance with NPS EN-1 Section 5.8 and NPS EN-3 part 2.6, the ExA concludes that:
- In accordance with NPS EN-1, paras 5.8.8 to 5.8.14, the Applicant's ES adequately describes the significance and value of cultural heritage assets and assesses likely archaeological features that may be affected by the Proposed Development; and the Proposed Development would take sufficient measures to avoid affecting offshore Scheduled Monuments (wrecks).
 - In accordance with NPS EN-1, paras 5.8.20 to 5.8.22, sufficient security is provided by the DMLs for proportionate investigation, treatment, recording and advancement of understanding of the significance of heritage assets in accordance with an agreed and secured WSI if they cannot be avoided by micro-siting and where there is a high probability of encountering as-yet-undiscovered assets.
 - In accordance with NPS EN-3, paras 2.6.144 to 2.6.146, the design of the Proposed Development has adequately considered heritage assets and their status as known at the time of the Examination, notably designated Protected Wrecks; and the Applicant could reasonably rely on micro-siting to mitigate risk of harm to offshore archaeology

allowing for the discovery of as yet unidentified marine archaeological assets within the Order limits.

- In accordance with NPS EN-3, para 2.6.142, the ExA accepts the Applicant's argument that the public sharing of data and records acquired through investigation to professional archaeological standards of heritage assets and chance discoveries during development, if realised, would deliver a significant beneficial cumulative effect (NPS EN-3, para 2.6.142).

- 5.18.53. In conclusion, the ExA notes the potential beneficial effects of cumulative offshore archaeological data acquisition and sharing, and considers that this should attract little weight in favour of the Order being made, but that these potential beneficial effects, if realised, would be incidental to the purposes of the Proposed Development and would merely offset risks of harm to archaeological assets that are inherent in the Proposed Development requiring mitigation under the WSI secured by the rDCO. Therefore, on balance the ExA considers that offshore archaeological and cultural heritage effects do not weigh against the making of the Order.

5.19. OTHER OFFSHORE INFRASTRUCTURE AND ACTIVITIES

Background and policy context

Introduction

- 5.19.1. This Section considers the impact of the Proposed Development on other offshore infrastructure and activities (as defined in NPS EN-3), which was not identified as a principal issue in the ExA's Rule 6 letter [PD-006]. Navigation and shipping, commercial fisheries and fishing and aviation and radar are covered in Sections 5.7, 5.11 and 5.13 of this Recommendation Report.
- 5.19.2. In its June 2017 Scoping Opinion, in relation to other offshore infrastructure and activities the SoS agreed to scope out a number of activities from the matters to be covered by the EIA including MoD activities due to the distance from the nearest Practice and Exercise Area. [APP-231, Table 18.4].

National Policy Statements

- 5.19.3. Section 2.6 in NPS EN-3 states the following matters required of an applicant in relation to effects on other offshore infrastructure and users:
- a. assessment of the potential effects of proposed OWF developments throughout their lifecycle on nearby existing operational offshore infrastructure (NPS EN-3, para 2.6.179);
 - b. early and continued engagement with potentially affected interested parties to seek solutions to allow OWF and other uses of the sea successfully to co-exist (NPS EN-3 paras 2.6.180 and 2.6.181); and

- c. to seek to minimise negative impacts to other offshore infrastructure or activities, reducing risks to as low as reasonably practicable (NPS EN-3, para 2.6.183).

5.19.4. NPS EN-3 requires the SoS to:

- a. be satisfied that site selection and design of the proposed OWF has been made with a view to avoiding or minimising disruption, economic loss or any adverse effect on safety to other offshore industries (NPS EN-3, para 2.6.184); and
- b. give substantial weight in its decision-making if a proposed development would be likely to result in adverse effects on the viability or safety of existing or approved licensed offshore infrastructure or activity (NPS EN-3, para 2.6.185).

The application

Environmental Statement

5.19.5. The Applicant's Environmental Statement (ES) Chapter 18 contains an assessment of offshore infrastructure and other users [APP-231]. It is supported by relevant figures showing the locations of other OWFs both within UK waters and outside UK waters [APP-413], other offshore infrastructure [APP-414] and aggregate dredging and marine disposal activity [APP-415].

5.19.6. Embedded mitigation relevant to other offshore infrastructure includes that the Proposed Development would be:

- a. located outside any areas licensed for dredging and aggregate extraction;
- b. located outside any known MoD danger areas;
- c. located outside any practice and exercise areas;
- d. located to avoid existing pipelines, telecommunications and transmission cables as far as possible; and
- e. that there would be ongoing consultation by the Applicant with owners and operators of offshore infrastructure, with the use of commercial and technical agreements when required [APP-231, Section 18.7.1].

5.19.7. The ES confirms that pre-application consultation with owners or operators of other infrastructure has taken place [APP-231, Table 18.4]. The ES identifies that there are oil and gas infrastructures within 5km of the Proposed Development's offshore Order Limits, still active at the time of publication of the ES [APP-231, Section 18.6.3]. However, the Applicant reports that consultation with owners and operators of the infrastructure within and adjacent to the Proposed Development has established that the existing infrastructure assets within the Proposed Development Order Limits should have been decommissioned by 2023, which would be prior to construction of the offshore elements of the Proposed Development [APP-231, Table 18.15].

- 5.19.8. The ES concludes that only if decommissioning of existing gas production infrastructure were delayed so as to overlap with the Proposed Development then commitment to proximity agreements and continued engagement between parties would ensure mitigation of impacts to no worse than minor adverse significance. In assessing worst case assumptions of impact to oil and gas operations and licence areas the ES confirms that the Applicant would continue to engage in discussions with licence owners throughout the project life and that proximity agreements would be agreed post-consent with the relevant licence owners [APP-231, Table 18.15].
- 5.19.9. The worst case assessment of impacts during construction in ES Chapter 18 also identifies that each pair of export cables between the OWF offshore substation and the landfall would cross a maximum of 11 existing cables and two pipelines and there would be up to 10 crossings within the project interconnector search area and 10 crossings within the array area, for which crossing and proximity agreements would be agreed post-consent with the relevant asset owners [APP-231, Table 18.15]. Potential impacts during decommissioning, including potential removal of cables, would be subject to discussion with owners of relevant infrastructure and a decommissioning plan. A decommissioning plan would need to be submitted to and agreed with the SoS prior to works in accordance with Requirement 14 (R14) if the dDCO.
- 5.19.10. Embedded mitigation for impacts to existing cable and pipeline infrastructure is secured through the Outline Scour and Cable Protection Plan (OSPCPP) [APP-707 superseded by REP14-030]. This specifies that each cable or pipeline crossing would require an agreement between the respective parties and would be finalised post consent following further pre-construction marine surveys. The OSPCPP is a certified document in the rDCO, and post-consent agreement in writing by the MMO of a final plan is secured in the dDCO Schedules 9 & 10 Part 4 Condition 14(1)(e)); Schedules 11 & 12 Part 4 Condition 9(1)(e); and Schedule 13 Part 4 Condition 7(1)(e). The dDCO Part 1 Interpretation of "*offshore cable crossings*" specifies the "*crossing of existing subsea cables or pipelines or other offshore infrastructure*".

Issues

- 5.19.11. There were no issues raised in the Examination in regard to impacts on other offshore infrastructure or activities, with the exception of Commercial Fisheries & Fishing and Navigation & Shipping which are reported in Section 5.11 and 5.17 respectively of this Recommendation Report.

Conclusions

- 5.19.12. The ExA is satisfied that:
- the Applicant has assessed potential effects of the Proposed Development throughout its lifecycle on nearby existing operational offshore infrastructure (NPS EN-3, para 2.6.179);

- the Applicant has undertaken early and continued engagement with potentially affected interested parties to seek solutions to allow OWF and other uses of the sea successfully to co-exist and to minimise negative impacts to other offshore infrastructure or activities, reducing risks to as low as reasonably practicable (NPS EN-3 paras 2.6.180 and 2.6.181 and 2.6.183); and
- site selection and design of the proposed OWF has been made with a view to avoiding or minimising disruption, economic loss or any adverse effect on safety to other offshore industries (NPS EN-3, para 2.6.184).

5.19.13. There have been no issues raised by IPs concerning other offshore infrastructure or activities in response to the application for the Proposed Development (other than as reported in Sections 5.11 and 5.17 of this Recommendation Report); and therefore the ExA has no reason to disagree with the Applicant's conclusion that worst case adverse effects of the Proposed Development on other offshore infrastructure would be no greater than minor adverse. The ExA also accepts that the proposed mitigation through agreements with other operators would minimise negative impacts and reduce risks to as low as reasonably practicable. Mitigation to effects on existing infrastructure is secured through the rDCO Schedules 9 & 10 Part 4 Condition 14(1)(e)); Schedules 11 & 12 Part 4 Condition 9(1)(e); and Schedule 13 Part 4 Condition 7(1)(e).

5.19.14. For the reasons given above, the ExA considers that effects to other offshore infrastructure and activities do not weigh against the Order being made.

5.20. TRANSBOUNDARY EFFECTS

5.20.1. Regulation 32 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regs), transpose Article 7 of EU Directive 85/337/EEC (as amended) into UK law as it applies to the PA2008 regime. On the basis of the information available from the Applicant, the Planning Inspectorate has undertaken two screenings on behalf of the SoS. The first screening was undertaken on 21 July 2017 [OD-002]. It concluded that the Proposed Development was likely to have significant effects on the environment of European Economic Area States. A notice was placed in the London Gazette on 26 July 2017 [OD-003] and the following States were notified:

- Belgium
- Denmark
- France
- Germany
- The Netherlands

5.20.2. Belgium, France, Germany and the Netherlands responded requesting to be involved in further consultation in relation to the proposed development. Denmark responded stating that it declined to participate.

- 5.20.3. Following the acceptance of the application, the second screening was undertaken under Regulation 32 of the EIA Regulations 2017 on 21 August 2019. Consultation letters were sent to the states which had previously requested further involvement, offering the opportunity for them to register as Interested Parties.
- 5.20.4. Netherlands and Germany responded to acknowledge the consultation letters but did not respond again with any detail. Belgium responded to confirm it has no comments to make. There was no response from France. The SoS therefore decided that it is not necessary to invite these states to participate in the Examination as Other Persons.
- 5.20.5. A Relevant Representation was received from Rijkswaterstaat [RR-015] stating its relationship with the Netherlands Government and its areas of special interest, which include cumulative environmental effects of OWFs with foreign OWFs and safety for shipping. No further communication was received from it during the course of the Examination.
- 5.20.6. No other comments or representations were received from any State during the Examination.
- 5.20.7. The Applicant does not expect transboundary direct impacts to known wrecks and aircraft to occur [APP-230], but there is potential for direct impacts to potential (unknown) transboundary offshore heritage assets within the Proposed Development. If artefacts are discovered further advice would be sought in their country of origin regarding the legal status of the remains; for further details, see Section 5.18 of this Recommendation Report.
- 5.20.8. Any further correspondence received in relation to transboundary issues will be passed to the SoS who must have regard to transboundary considerations and to any responses made by any EEA State.

5.21. WASTE MANAGEMENT STRATEGY

Background and policy context

Introduction

- 5.21.1. This section considers Waste Management Strategy, which was not identified in the ExA's initial assessment of principal issues [PD-006].
- 5.21.2. There is an inter-relationship of this topic with other parts of this Recommendation Report: Section 5.4 (Onshore construction effects), Section 5.7 (Water resources and flood risk, ground conditions and contamination), Section 5.9 (Marine biodiversity, biological environment and ecology) and Section 5.10 (Marine and coastal processes).

National Policy Statements

- 5.21.3. The Overarching National Policy Statement for Energy (NPS EN-1) and the National Policy Statement for Renewable Energy Infrastructure (NPS-

EN-3) provide the primary basis for decision making on applications for nationally significant renewable energy infrastructure.

- 5.21.4. NPS EN1 requires the Applicant to set out the arrangements that are proposed for managing any waste produced and prepare a management plan for site waste which should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this would be the best overall environmental outcome (NPS EN-1, para 5.14.6).
- 5.21.5. Section 5.14 in NPS EN-1 requires that the SoS should be satisfied that:
- a. The Applicant has proposed an effective system for managing hazardous and non-hazardous waste arising from the construction, operation and decommissioning of the Proposed Development (NPS EN-1, para 5.14.7).
 - b. Waste would be properly managed on-site and off-site without adverse effect on capacity of existing facilities to deal with other waste arisings (NPS EN-1, para 5.14.7).
 - c. Adequate measures have been proposed to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this would be the best overall environmental outcome (NPS EN-1, para 5.14.7).
- 5.21.6. Where necessary, the SoS should use requirements or obligations to ensure that appropriate measures for waste management are applied (NPS EN-1, para 5.14.8).
- 5.21.7. Where a project is subject to the Environmental Permitting (EP) regime, considerations set out in NPS EN-1 Section 4.10 regarding pollution control apply (NPS EN-1, para 5.14.9). The SoS should not refuse consent on the basis of pollution impacts unless it has good reason to believe that any relevant necessary operational pollution control permits or licences or other consents will not subsequently be granted (NPS EN-1, para 4.10.8).

The National Planning Policy Framework

- 5.21.8. The National Planning Policy Framework 2019 (NPPF) is a relevant consideration for NSIP development proposals in respect of responsibilities to minimise waste and pollution and to have regard to responsible sourcing of materials for construction.

Other planning policy and legislation

- 5.21.9. The legislation and guidance relevant to Waste Management is set out in the ES Appendix 19.3 [APP-585, Section 3]. Key legislation and policies are identified in Chapter 3 of the ES [APP-216]. The Applicant's Planning Statement sets out the national, regional and local planning policies that are considered relevant to the Proposed Development [APP-693].
- 5.21.10. The revised Waste Framework Directive (rWFD) (2008/98/EC) is the primary European legislation applicable to this DCO application. The

Waste (England and Wales) Regulations 2011 implements the rWFD in England and Wales.

- 5.21.11. The Waste Prevention Programme for England published 2013 is a requirement of the rWFD. The duty of care in regard to waste is a legal requirement of Section 34 of the Environmental Protection Act 1990, to handling of waste safely and in compliance with the appropriate regulations. The National Planning Policy for Waste 2014, the National Policy Statement for Waste Water 2012 and the Waste Management Plan for England 2013 are applicable to this Proposed Development.

The application

Environmental Statement

- 5.21.12. The Environmental Statement (ES) contains a waste assessment and management strategy in ES Volume 1 Chapter 19 Appendix 19.3 Waste Technical Assessment [APP-585].
- 5.21.13. Most of the waste arisings from the Proposed Development would be excavated material [APP-585, para 197]. The relevant works under Scenario 1 include temporary works areas and reinstatement of running track along the cable route; and relevant works under Scenario 2 include landfall; temporary works areas; temporary topsoil strip; trenchless crossings; and works along the cable route and at the onshore substations .
- 5.21.14. The Applicant states that waste produced during operation and maintenance would be minor in quantity and that waste would be managed in accordance with the general principles of the waste duty of care (as contained in the Waste (England and Wales) Regulations 2011) [APP-585, paras 209 to 216].
- 5.21.15. The application includes a Schedule of Mitigation [APP-688], which was updated during the Examination [REP18-017]. Embedded mitigation that is common across the project is set out in Section 5.1 of this Recommendation Report.
- 5.21.16. A Materials Management Plan (MMP) secured as a daughter plan to the CoCP under Requirement 20 (R20) of the dDCO [REP18-009], would be developed post-consent to include information regarding the management of materials during construction in a sustainable manner, for example reusing materials on site where possible which would also deal with excavated waste management, as identified in the Schedule of Mitigation [REP18-017].
- 5.21.17. A Site and Excavated Waste Management Plan (SEWMP) is also required to be prepared and approved as a daughter plan to the CoCP under R20 of the dDCO [REP18-009], to provide a record of any decisions related to materials resource efficiency in the design and planning of the project, and an estimate of the quantity and proposed management of each type of waste that would be produced [APP-585, Section 6.2].

- 5.21.18. The Applicant proposes a precautionary approach to mitigate any impacts through the SEWMP and CoCP should any contaminated material be encountered in the construction phase, following the principles defined in Environment Agency Contaminated Land Report 11, ('CLR11') [APP-585, Section 6.2]. Waste produced during the operational phase would be managed in accordance with the legislated waste duty of care [APP-585 Section 9.2].

Decommissioning

- 5.21.19. Measures for waste management proposed for the construction phase would be applied during decommissioning, subject to recognising that industry best practice, rules and legislation may change over time [APP-585 Section 9.3]. This is also discussed in Section 5.7 of this Recommendation Report which reports on a proposed Contaminated Land and Groundwater Plan (CLGP), to be prepared and approved as a daughter plan to the CoCP under R 20 of the dDCO [REP18-009].

Local Impact Reports

- 5.21.20. No specific points about waste management were raised in the Norfolk County Council (NCC) Local Impact Report (LIR) [REP2-085], or the North Norfolk District Council (NNDC) LIR [REP2-087]. Breckland Council defers to NCC's statutory role to assess matters relating to minerals and waste, flood risk and public health [REP2-062].

Issues

Onshore waste management

- 5.21.21. No issues concerning the onshore waste management strategy were raised in Relevant Representations by IPs or OPs.
- 5.21.22. The SoCG with the EA agreed that the wording of R20 in the dDCO and its daughter plans proposed to be certified is considered appropriate and adequate on the matters of pollution control, site and excavated waste management and soil management plans, and provides for the EA to be consulted on the final CoCP elements for each phase of the Proposed Development [REP9-020 Page 19].
- 5.21.23. In the SoCG with NCC it was agreed that NCC as the relevant Waste Planning Authority has no objections to the Proposed Development [REP16-012].
- 5.21.24. In the SoCG with the Applicant, NNDC confirmed that it is content with the proposed strategy for dealing with unexpected contamination as secured in the CoCP [REP9-016].
- 5.21.25. With the reassurance that the relevant authorities have agreed with the Applicant's proposed strategy for onshore waste management and the ExA is satisfied that the application satisfies the requirements of NPS EN-1 para 5.14.7 because the Applicant has proposed the following:

- a. a strategy (“*system*”) for managing waste (hazardous and non-hazardous) arising from the construction, operation and decommissioning of the Proposed Development that is capable of being effectively implemented;
- b. waste would be managed predominantly on-site such that any needing to be dealt with off-site is not expected to have adverse effect on capacity of existing facilities to deal with other waste arisings; and
- c. waste management measures that are likely to be adequate to minimise the volume of waste produced and the volume of waste sent for disposal.

5.21.26. The ExA is also satisfied that the NPS EN-1 para 5.14.8 is met because:

- a. requirement for post-contract agreement of detailed plans under the Applicant’s proposed strategy for waste management is secured through a SEWMP to be prepared and approved as a daughter plan to the CoCP under R20 of the dDCO; and
- b. agreement of detailed plans for decommissioning would be subject to adequate controls by relevant authorities secured under R20 of the rDCO, to ensure adherence to measures proposed for waste management during the construction phase, subject to recognising that industry best practice, rules and legislation may change over time.

Offshore sediment and control of potential pollution

5.21.27. This matter is discussed in detail in Section 5.9 of this Recommendation Report and Chapter 6 in relation to HRA matters.

5.21.28. The MMO raised concerns regarding disposal of offshore drill arisings and other construction sediments during operations and maintenance along with assessment of impacts [RR-069].

5.21.29. The Applicant responded that the Project Environmental Management Plan (PEMP) [REP5-035] secured by dDCO Condition 14(1)(d) of Schedules 9 and 10 and Condition 9(1)(d) of Schedules 9 and 10 [REP18-009] would include details of waste management and disposal arrangements offshore and the final PEMP would require agreement with the MMO in consultation with the SNCB [AS-024, Page 69]. The MMO subsequently confirmed that it is content with this answer as agreed in its SoCG with the Applicant [REP16-009].

Conclusions

5.21.30. Having examined the application, the ES and the issues discussed above the ExA concludes that:

- a. in accordance with NPS EN-1 para 5.14.7, the Applicant proposed an effective strategic system for managing waste arising from the Proposed Development such that waste would be managed predominantly on-site and is not expected to have adverse effect on capacity of existing facilities; and such that the volume of waste produced sent for disposal would be minimised.

- b. the ExA is also satisfied that the policy test in NPS EN-1, para 5.14.8 is met because post-contract application for agreement by relevant authorities of detailed measures under the Applicant's proposed strategy for waste management is secured through the CoCP and its daughter plans under rDCO R20.
- c. in accordance with NPS EN-1, paras 5.14.9 and para 4.10.8 the ExA has received no evidence to suggest that any relevant necessary operational pollution control permits or licences or other consents may not subsequently be granted and that as such this is no reason to withhold the making of a DCO;
- d. the SEWMP, which is proposed as a certified document under the dDCO, would be sufficient to achieve the Applicant's stated aims in terms of waste management and to meet the aims of relevant policies of the local authorities' development plans; and
- e. the Applicant has taken account of the NPPF, The National Planning Policy for Waste (NPPW), and considers that the proposed development would accord with the general principles set out in the NPPW and NPPF.

5.21.31. The ExA concludes that the issue of waste management does not weigh against the Order being made.

5.22. CUMULATIVE EFFECTS AND INTER-RELATIONSHIPS

Introduction

- 5.22.1. Cumulative effects of the Proposed Development were identified as a principal issue in the ExA's Rule 6 letter [PD-006]. Cumulative effects have been reported in the topic sections of this Chapter and considered in the ExA's reasoning and conclusions on these topics. There were some outstanding disagreements over cumulative impact assessment (CIA) which are listed below.
- 5.22.2. The policy background and reference to the Applicant's CIA are reported in Chapter 4 together with matters raised regarding which projects should be included in the CIA. In-combination effects, as they relate to HRA, are reported in Chapter 6.
- 5.22.3. A matter which became apparent during the Examination was the inter-related effects; how they had been assessed and the means by which they would be mitigated. These, together with the ExA's findings on the effects on communities, are reported below in this Section.

The Applicant's cumulative impact assessment

- 5.22.4. The Applicant's CIAs (offshore [APP-245] and onshore [APP-246]) conclude that there would be significant effects (as assessed and defined in the relevant topic chapters of the ES) as follows:

- a. moderate adverse for certain offshore commercial fisheries (Dutch beam trawling and seine netting and Anglo-Dutch beam trawling), in construction and operational phases);
- b. moderate adverse for onshore ecology for hedgerows and bats for Scenario 2, but that these effects are stated to reduce to non-significant over time as replacement hedgerows mature;
- c. adverse for landscape character for Scenario 1 stated to reduce to non-significant after 20 years (nature of effects not stated - different methodology used, which adopts a binary approach to significant or not significant);
- d. adverse for visual amenity for Scenario 1 on road users (10m stretch, reversible after 25 years) and walkers (550m stretch, reversible and beneficial after 20 years) (different methodology used, as item c above);
- e. moderate adverse for water quality under Scenario 2 resulting from direct disturbance to surface water bodies and/or increased sediment supply on two river catchments;
- f. beneficial for offshore archaeological data acquisition and sharing (stated in the cumulative section of the ES chapter on Offshore Archaeology and Cultural Heritage [APP-230, Section 17.8]);
- g. moderate beneficial for human health for the operational phase for both scenarios, when considered in the context of National and International populations of England and beyond because of the reduction in carbon dioxide emissions which it states would lead to a myriad of health benefits; and
- h. major beneficial for socio-economic in terms of job creation during construction and supply chain job creation during the operational phase for both scenarios.

5.22.5. Consideration of these significant cumulative effects has been reported in the relevant topic sections of this Chapter 5. Their overall contribution to the weight the ExA attributes in the planning balance is included in Chapter 5 Section conclusions and in Chapter 7.

5.22.6. At the end of the Examination there remained outstanding differences of opinion regarding CIA, set out in the Statement of Commonality of SoCG document [REP10-035] as follows:

- a. Norfolk County Council (NCC) disagreed with the findings for traffic and transport (but only for the B1149), reported in Section 5.2 on Traffic and Transport and 5.4 on Onshore Construction Effects.
- b. Broadland DC disagreed with the findings for noise (in Cawston village), also reported in Section 5.2 on Traffic and Transport.
- c. The Wildlife Trusts (TWT) and Whale and Dolphin Conservation (WDC) disagreed with findings for marine mammals, reported in Section 5.9 Marine Biodiversity, Biological Environment and Ecology.
- d. Natural England (NE) and the RSPB disagreed with findings for offshore ornithology, and the MMO deferred to NE on this matter, reported in Section 5.9 on Marine Biodiversity, Biological Environment and Ecology and Chapter 6 covering HRA.

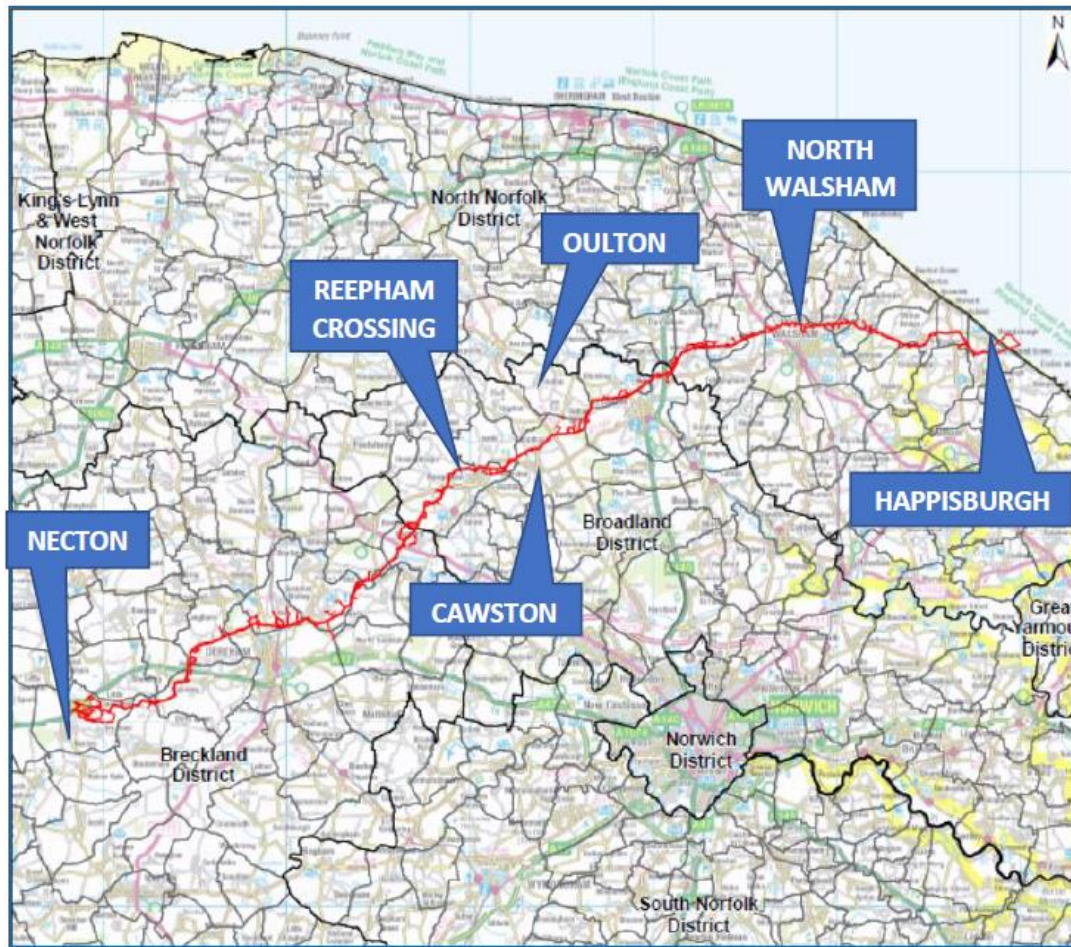
- e. VisNed and the NFFO jointly disagreed with the findings for commercial fisheries, reported in Section 5.11 on Commercial Fisheries and Fishing.

5.22.7. There were also outstanding disagreements and concerns on certain onshore cumulative topics with three parish councils, a community group and residents from the settlements of Necton, Cawston and Oulton. Concerns on cumulative effects were raised by their representatives including the MP for Broadland [REP14-080] and the Broadland County and District Councillor [REP14-081]. The NFU/LIG and residents raised concerns regarding the cable crossing location with the Hornsea Project Three OWF north of Reepham. The ExA asked about futureproofing against adverse cumulative effects at whichever ports would be used.

5.22.8. The outstanding concerns over cumulative matters raised are listed below with locations shown on Figure 5.22.1 below:

- a. operational stage landscape and visual effects of substations at Necton, reported in Section 5.3;
- b. construction and operational effects of thermal efficiency, land-take and EMFs at the crossover with cables from Hornsea Project Three (if consented) north of Reepham, reported in Section 5.8;
- c. construction stage traffic and noise effects in the village of Cawston, reported in Section 5.2;
- d. construction stage traffic and noise effects in Oulton along The Street, reported in Section 5.2; and
- e. construction stage effects at base port(s), reported in Section 5.2.

Figure 5.22.1: Key onshore locations along the cable corridor: extract from [APP-428] with names of key locations added



- 5.22.9. The ExA has considered all these matters in accordance with the NPSs and concluded in the relevant sections of Chapter 5 and Chapter 6 (where HRA-related). The ExA's conclusions vary according to circumstance finding some cumulative effects would weigh in favour, some would weigh against the Order being made and others require additional mitigation, which has been consulted upon during the Examination and then included by the ExA in the rDCO. Matters such as the cumulative adverse construction stage traffic effects on communities also are considered in their inter-relationship with other effects. This is set out below.

Cumulative effects and inter-related effects

The application and methodology

- 5.22.10. As well as covering CIA on a topic-by-topic basis in the ES, each technical chapter also considers inter-relationships of impacts on receptors, where adverse or beneficial effects together could have a combined effect on a receptor [APP-219, Sections 6.5.5.4 and 6.5.5.5]. In each ES topic chapter, there is a section which sets out with which other topics that specific topic would have an inter-relationship.

- 5.22.11. The ES chapter on Human Health adopts a different approach. It considers the inter-relationships between health effects both from within the project and in combination with effects from other projects. Intra-project cumulative effects comprise the combined influence from different aspects of the Proposed Development on the same population groups [APP-240, Section 27.7].
- 5.22.12. The SoS has an obligation to consider how accumulation of and interrelationships between effects might affect communities as a whole, even if acceptable individually with mitigation in place (NPS EN-1, para 4.2.6). The ExA sought clarity from the Applicant as to where such an overall summary of inter-relations together with cumulative effects on communities could be found [PD-022, Q5.4.0.5].
- 5.22.13. The Applicant explained that it had only assessed communities adjacent to the cable route because "*the footprint for environmental impacts is restricted to the areas adjacent to the cable route*" based on guidance and advice set out by Public Health England (PHE). The assessment, which covers all construction impacts along the relevant cable route found no significant adverse effects. The Applicant felt that a community-by-community assessment would not be proportionate based on the temporary and episodic nature of the adverse effects and the mitigation that would be delivered through the sectional approach to construction. The Applicant also pointed out that all relevant bodies had agreed that the approach was compliant and proportionate and that its CIA found that adverse effects on communities would not be significant [REP14-036, Q5.4.0.5].
- 5.22.14. No representations were received disputing the cumulative assessment of inter-related construction effects methodology. The ExA notes that because the assessment was based on the proposed cable corridor, it did not always capture where the adverse construction stage effects could occur. However, a considerable amount of evidence was submitted to this Examination about the sequential accrual of inter-related, adverse construction effects (which have been assessed as not significant) on some communities. The ExA considered these to be important and relevant matters, seeking and receiving extensive evidence from the communities which would be affected due to the cumulative effects of the Proposed Development with other developments and potential projects.

Cumulative and inter-related effects over time in Broadland District

- 5.22.15. At OFH3 (Oulton and Cawston sessions) a number of IPs mentioned cumulative construction disturbance continuing over what they estimated to be an 11-year period [EV13-010], [EV13-012]. The Applicant was asked to confirm what the worst case scenario would be (duration of specific construction activities and number of years in total) for Cawston, Oulton and the proposed crossing north of Reepham.
- 5.22.16. The Applicant provided its best estimate of the worst case, which was that for cumulative adverse effects for Scenario 1 or Scenario 2 with Hornsea Project Three OWF (if consented) the duration would be just

over six years. However, the Applicant explained that this did not represent a continuous effect for six years given that works would stop and start during that period of time. [REP14-036, Q5.4.0.3]. The Applicant stated that the period of works in Broadland District for Scenario 1 would be 38 months over six years and for Scenario 2 would be 24 months over four years. The Applicant provided more detailed worst case estimates of the timescales for different activities, but was unable to identify when specific construction activities would be undertaken in specific areas such as Cawston, Oulton or the crossing north of Reepham because detailed construction programmes would not be developed until contractors were appointed [REP14-036, Q5.4.0.3].

- 5.22.17. The main concerns that were raised at OFH3 and in other submissions by Broadland residents and representatives were in connection with additional HGV and other traffic through the villages, which could potentially give rise to inter-related effects in terms of traffic, noise, vibration and air quality. This has been reported in Section 5.2 of this Recommendation Report.
- 5.22.18. The ExA accepts the argument put forward by the Applicant, regarding its lack of ability to detail the potential overlaps of the construction programmes at this stage. The ExA also notes the good intention of the Design Interaction and Co-operation Agreement with Ørsted which states that matters would extend to the two parties sharing information and agreeing mitigation, such as traffic management measures and plans aiming to minimise the cumulative adverse construction effects on the local road network, noise management and public rights of way [REP18-032, Section 2.4]. However, as the design and co-operation agreement is deemed confidential only a list of matters pertinent to construction management and implementation has been made available to the Examination, and nothing is secured in the dDCO.
- 5.22.19. The ExA is however, satisfied that the Applicant has presented the worst case duration for the cumulative projects it has included in its CIA and that the inter-related effects at Cawston and Oulton would amount to just over six years, not 11 years as some IPs had indicated.

Adverse cumulative and inter-related effects on communities

- 5.22.20. Parish councils and other IPs expressed deep concern over what appeared to them to be a process which looks at potential nationally significant infrastructure projects and other projects in isolation, without considering the sequential, construction stage onshore traffic and associated adverse effects on rural village communities.
- 5.22.21. IPs also expressed their view that if cumulative project timeframes moved closer together, the issues arising from the use of shared routes would be even greater. Cawston PC argued that the adverse cumulative effects had been consistently underplayed and that even more negative effects could materialise if undertakers sought variations to the approved plans at some later date [REP18-033].

- 5.22.22. The MP for Broadland urged that the Proposed Development should only be consented if there were safeguards in place for *"those communities who are expected to suffer prolonged harm in the cause of providing renewable energy that we all agree is to be desired"* [REP14-080].
- 5.22.23. Happisburgh PC drew attention to the low sum it receives via its precept and argued that it could not resource engagement in the consultation process when it had to be self-funded. It had asked the Applicant to assist with funding the Parish Council's engagement, but this suggestion was turned down [REP1-047].
- 5.22.24. The ExA was struck by the strength of feeling from the locally elected representatives and others over the anticipated cumulative adverse construction effects as well as the adverse operational effects from the number of new substations. In their opinion, an alternative means of connection which would eliminate the need for onshore point to point connections was very much required.
- 5.22.25. Emphasising this concern further, Oulton PC stated *"the whole experience has been exhausting and seemingly pointless when other much more efficient solutions exist."* [REP9-015]. By other solutions, Oulton PC was referring to an offshore ring main (ORM).
- 5.22.26. At the close of the Examination, Oulton PC wrote:
- "October 12th 2020 brings to a close an extraordinary few years for many parishes in Norfolk – some 28 affected by Norfolk Vanguard/Boreas alone – who have spent disproportionate amounts of time wrestling with vast amounts of paperwork and then trying to explain to the NSIP process, as each scenario unfolded, the sheer magnitude of the impacts that these proposals would have on them.*
- "We have considered three enormous wind farm projects so far: Hornsea Project Three, Norfolk Vanguard and now Norfolk Boreas. At the close of each examination process, it has been clear that some at least of the cumulative effects of these proposals would be a can kicked down the road to the next examination."* [REP18-035].
- 5.22.27. Happisburgh PC felt that the outcome of this NSIP planning process was heavily stacked against the communities that could be affected by proposed development [REP1-047].
- 5.22.28. On behalf of Necton and surrounding communities the local parliamentary candidate stated:
- "...as is the case here with Norfolk Boreas (and Norfolk Vanguard), the companies behind these Offshore Wind Farm applications are so often failing to properly work with local communities and account for environmental factors...*
- "The result will be (and is already beginning to be) a plethora of Offshore Wind Farm applications hoping to bring their infrastructure onshore via a proliferation of cabling corridors that will cut across and damage*

internationally significant environmental habitats and top quality farmland to reach inappropriately sited substations.” [REP2-102].

- 5.22.29. The ExA notes the many representations submitted which set out the benefits of alternative means of connection other than onshore point to point grid connections. In particular, the case made by Norfolk and Suffolk MPs to BEIS in October 2019 [REP1-064]. Oulton PC drew the ExA’s attention to the 30 September 2020 National Grid Electricity System Operator (NGESO) offshore co-ordination project consultation (enclosing a copy) which is part of BEIS’s review of the offshore transmission network announced on 15 July 2020 [REP18-035]. Oulton PC stressed that it was not suggesting that the ExA should halt its deliberations until the full results of the BEIS review are published, but that some weight should be given to this initiative in the planning balance, when considering the benefits of the Proposed Development.
- 5.22.30. The ExA recognises that many of the comments made during this Examination about adverse onshore construction and operational effects may have wider applicability to the aforementioned consultation and BEIS review. However, the remit of this ExA is to consider the application for the Proposed Development. To summarise, the key adverse onshore construction effects are:
- a. cumulative and inter-related adverse effects of the construction stage for onshore communities, not only those associated with the cable corridor;
 - b. adverse cumulative landscape and visual effects of substations;
 - c. the extended period over which cumulative adverse effects could be experienced with each new NSIP consent;
 - d. ongoing volunteer resources and expertise required to participate in sequential NSIP applications;
 - e. the independence of each examination, which does not account for future onshore adverse cumulative effects if projects are not far enough advanced to be included in the CIA;
 - f. the mitigation and compensation requests from communities, found not to be sound and the views of hosting communities that it is unfair that they have to compete for community compensation funds; and
 - g. the anxiety and stress which it is argued can arise from the sequential consultation requirements.
- 5.22.31. Of these points above, the ExA has explored and reported on cumulative adverse effects and considered these in its recommendation. The ExA recognises the challenges for local communities in terms of the volunteer input and resources needed and anxiety that can be caused, which can be exacerbated by the sequential nature of NSIP applications which cover similar geographical areas, but must take a view on the level of detail available about forthcoming projects for inclusion in CIA. Finally, compensation is not a matter which can be addressed through PA2008, so it is necessarily down to applicants and affected communities to discuss.

- 5.22.32. The ExA appreciates the manner in which parish councils, elected members and other IPs diligently responded to the ExA's questions, attended hearings and engaged throughout the extended Examination period in a very constructive way. We also acknowledge the deeply held views of the local communities in this part of Norfolk.

Consultation and engagement with communities which would experience adverse cumulative effects

- 5.22.33. In summing up on cumulative and inter-related effects on communities, the ExA draws attention to the fairly consistent negative opinions about the quality of the Applicant's consultation. In Section 5.3, the ExA concluded that the consultation was adequate in terms of PA 2008's requirements. The ExA acknowledges that a negative perception can often arise when a developer seems not to include (or exclude) what a community wants. However, the level of dissatisfaction appeared unusually high across many of the community representatives. This was especially prevalent in communities in locations where cumulative adverse effects would arise, both at construction and operational stages.

- 5.22.34. One example from Cawston PC; reflecting as the Examination drew to a close said

"The enormous voluntary response from many of Norfolk's Parish Councils with communities threatened by this application should also be considered. For many small councils this has become a David and Goliath contest, when it could, and should, have been an opportunity to cooperate to secure a better solution for our County, our communities and the Applicant. There are no clear winners in this confrontational process. If their application is approved Vattenfall still need to construct their cable route and to do that will rely on the forbearance and cooperation of village communities who they have spent the last two years antagonising." [REP18-033].

- 5.22.35. There are other examples reported in Section 5.3 regarding the consultation which had been undertaken regarding the proposed substations.
- 5.22.36. The importance of future relations must not be lost because much of the mitigation for aforementioned cumulative and/or inter-related, construction stage adverse effects in settlements rests on matters which would be consulted upon with the local communities. The Applicant stated it would meet the ongoing needs of different stakeholders through the Community Liaison Officers' (CLO) handling of feedback, dealing with issues, concerns and grievances, finding resolution, managing communication and assessing, evaluating and proposing mitigation [REP14-036, Q5.4.0.7]. Oulton PC sought clarity on the terms of engagement upon which its future relationship with the Applicant would rest [REP18-035].
- 5.22.37. It is the ExA's view that constructive ongoing dialogue with communities would be necessary if the Order is made, to enable the CLO role, which is part of the mitigation, to be delivered satisfactorily. Another area would

be to involve community representatives in aspects of the detail design of the substations. As stated in the NIC Design Principles, which the Applicant has adopted via the DAS [REP14-014]:

"While it won't always be possible to please everyone, engagement should be diverse, open and sincere, addressing inevitable tensions in good faith and finding the right balance."

Conclusions

- 5.22.38. The outstanding CIA matters have been reported above. The ExA's considerations of them are included in earlier sections of Chapter 5 of this Recommendation Report. Although those statutory bodies consulted did not question the method of assessment of inter-related effects, in the ExA's view it did not address the combined, inter-related, adverse effects (which were also cumulative in some cases) holistically at some key locations. The ExA has examined these matters as raised considering how accumulation of and inter-relationships between effects might affect communities as a whole, even if acceptable individually with mitigation in place (NPS EN-1, para 4.2.6).
- 5.22.39. In considering the evidence presented during the Examination, the ExA concludes that in certain locations the accumulation of inter-related adverse effects would weigh against the Order being made even with the secured mitigation. These are construction stage effects at Cawston and Oulton. These matters have also been reported in Section 5.4 of this Recommendation Report on construction effects. The ExA has ascribed medium weight against the making of the Order to these inter-related construction stage effects.
- 5.22.40. There would be reliance on details to be submitted for discharge of requirements to ensure that the mitigation for separate adverse effects is integrated as detail designs come forward and is delivered as planned. This places responsibility on the relevant planning authorities to provide that assurance in two ways:
- a. processes and resourcing to ensure that there is capacity to enact the role for discharge of requirements in the rDCO; and
 - b. liaison during construction and dealing with any complaints escalated by the CLO.
- 5.22.41. These in turn require the relevant planning authority to have the right resources in place, and for good working relationships and trust between communities and the CLO and communities and the undertaker in taking forward the detail designs. Resourcing the former could be achieved through a Planning Performance Agreement, which parties have indicated is intended, although the ExA notes was not in place at the end of the Examination.
- 5.22.42. The latter requires constructive working, whereby the Applicant acknowledges the volunteer resourcing required and stress implications of the ongoing cycle of sequential NSIP engagement that these communities are experiencing. The ExA is concerned that without this

understanding in place, there is a high risk that future collaborative working with the local community might not succeed, to the detriment of all parties.

- 5.22.43. Matters to do with compensation for adverse effects or for assistance to facilitate engagement during the Examination are for parties to negotiate outside the examination process and therefore the ExA cannot comment on this.
- 5.22.44. Finally, the ExA acknowledges that consultations about future applications do increase awareness amongst local communities about the possibility of further cumulative effects in the future. The ExA has formed a view about which projects should be included in the CIA for the Proposed Development, based on the advice available (Chapter 4). However, as there are successive applications, which would affect the same communities onshore this is a matter which would only become more prevalent. In the absence of an alternative solution in the short to medium term, the ExA notes that the SoS can ensure these matters are adequately addressed through Scoping Opinions for new projects and that the BEIS review of the offshore transmission network gives regard to cumulative and inter-related onshore construction effects.

5.23. CONCLUSIONS IN RELATION TO THE PLANNING ISSUES

- 5.23.1. This chapter has detailed the ExA's consideration of the main issues in the Examination and the ExA's conclusions in relation to the NPS policy framework and other policy as appropriate. The overall balance of issues is set out in Chapter 7 of this Recommendation Report.

6. FINDINGS AND CONCLUSIONS IN RELATION TO HABITATS REGULATIONS ASSESSMENT

6.1. INTRODUCTION

- 6.1.1. This Chapter sets out the ExA's analysis and conclusions relevant to the Habitats Regulations Assessment (HRA). This will assist the Secretary of State (SoS) for Business, Energy and Industrial Strategy (SoS), as the competent authority, in performing its duties under the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as codified) (the Habitats Directive) and the Council Directive 79/409/EEC on the conservation of wild birds (2009/147/EC), as transposed in the UK through the Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations').
- 6.1.2. Consent for the Proposed Development may only be granted if, having assessed the potential effects on European sites, the competent authority considers that the tests in the Habitats Regulations have been met. European sites in this context includes the sites protected by legislation (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Sites of Community Importance (SCI) and candidate Special Areas of Conservation (cSACs)) and those given an equivalent status by national planning policy (possible SACs (pSACs), potential SPAs (pSPAs), listed Ramsar sites and proposed Ramsar sites for which the UK is responsible.
- 6.1.3. The ExA has been mindful throughout the Examination of the need to ensure that the SoS has such information as may be reasonably required to carry out its duties as the competent authority. It has sought evidence from the Applicant and the relevant Interested Parties (IPs) including Natural England (NE) as the Statutory Nature Conservation Body (SNCB) through written questions and Issue-Specific Hearings (ISHs).
- 6.1.4. The ExA produced a Report on the Implications for European Sites (RIES) [PD-020] which compiled documents and signposted relevant information provided in the DCO application and Examination representations up to Deadline 7 (D7) (31 March 2020). The RIES was issued to ensure the ExA had correctly understood the relevant information and the position of the IPs in relation to the effects of the Proposed Development on European sites at that point in time. Consultation on the RIES took place between 31 March and 29 April 2020.
- 6.1.5. Comments from the Applicant [REP9-009] and NE [REP9-057] were received at D9; comments from the Royal Society for the Protection of Birds (RSPB) were submitted at D10 [REP10-067]. The Applicant responded to the comments on the RIES at D10 [REP10-042].
- 6.1.6. As the RIES was issued some months before the closure of the Examination in October 2020, this Chapter is necessarily longer than usual in order fully to consider the other relevant evidence submitted at D8 to D18. The comments on the RIES and subsequent evidence

submitted have all been taken into account in the drafting of this Chapter.

6.2. PROJECT LOCATION IN RELATION TO RELEVANT EUROPEAN SITES

- 6.2.1. The Proposed Development would be located to the east of the Norfolk coast. The export cable would run from the OWF to the landfall point at Happisburgh, South, Norfolk. The onshore cables would then run approximately 60km to the National Grid substation at Necton, Norfolk. The export cable would run through the Greater Wash SPA, the Haisborough, Hammond and Winterton (HHW) SAC and the Southern North Sea (SNS) SAC. The export cable and landfall would also be in the vicinity of the Outer Thames and Alde-Ore Estuary SPAs.
- 6.2.2. The onshore cable would cross the River Wensum SAC. The Norfolk Valley Fens SAC, the Broadland SAC/SPA/Ramsar site and the Paston Great Barn SAC lie within the 5km buffer zone the Applicant has identified around the onshore cable route.

6.3. HRA IMPLICATIONS OF THE PROJECT

- 6.3.1. The Proposed Development is not connected with, or necessary to, the management for nature conservation of any of the European/Natura 2000 sites considered within the Applicant's assessment. For the purposes of this report 'Natura 2000 sites' refers to sites across Europe designated under the Habitats Directive and Birds Directive.
- 6.3.2. The Applicant's assessment, as presented in the HRA Report [APP-201], submitted with the DCO application considered a total of 202 European and Natura 2000 sites which are listed in Annex 1 of the RIES [PD-020]. The Applicant's assessment considers two different scenarios [APP-218]:
- Scenario 1 – Norfolk Vanguard OWF would proceed to construction and install ducts and other shared enabling works for the Proposed Development; and
 - Scenario 2 – Norfolk Vanguard OWF does not proceed to construction and the Proposed Development would proceed alone. The Proposed Development would undertake all works described as an independent project.
- 6.3.3. While some effects are the same for both scenarios, others are different for each scenario. The ExA has considered the effects which would arise from both scenarios. It is the Applicant's view that in general Scenario 2 is considered to be the worst case scenario for onshore effects and Scenario 1 for offshore. These effects are assessed in the relevant chapters of the ES which provide supporting evidence for the Applicant's HRA.

- 6.3.4. The criteria used by the Applicant to identify European/Natura 2000 sites that could potentially be affected by the Proposed Development are described in Section 3 (marine mammals features), Section 4 (benthic ecology features), Section 5 (marine and anadromous fish features) and Section 6 (ornithological features) of [APP-202] and Section 2 of [APP-203] (terrestrial sites).

6.4. ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS (LSE)

- 6.4.1. The Applicant's approach, as described in [APP-201] to [APP-202], was to identify likely environmental effects that would result from the construction, operation or decommissioning of the Proposed Development and to consider if there was a pathway by which the qualifying features of a European site could be affected. The effects that were considered are summarised in Table 2.1 of the RIES [PD-020].
- 6.4.2. European sites considered to be within the zone of influence of the Proposed Development were only screened out if there was no impact pathway or if the site was considered to be too far from the Proposed Development for effects to be anything other than negligible. The approach to assessing in-combination effects and the categories of plan or project to be considered in the assessment is described in [APP-201], [APP-202] and [APP-203]. However, in-combination effects did not appear to have been taken into account in determining if LSE would arise – instead LSE was identified where any effect pathway was determined. In-combination effects were taken into account in the assessment of Adverse Effects on the Integrity (AEoI) of European sites.
- 6.4.3. The Applicant's approach appears to digress from the requirements of the Habitats Regulations which require the identification of LSE from the Proposed Development alone **or** in combination with other plans or projects. The Applicant has instead considered likely significant effects alone **and** in combination with other plans or projects. The ExA notes however that NE did not raise any particular concerns about the Applicant's overarching approach to assessment of in-combination effects.
- 6.4.4. The Applicant's HRA Report [APP-201] and Screening Reports [APP-202, APP-203] identified LSE on the sites and qualifying features listed below.

Site name	Qualifying feature	Effect
Alde-Ore Estuary SPA and Ramsar site	Lesser black-backed gull (LBBG) (breeding) population	Collision mortality
	Gannet (breeding)	Collision mortality

Site name	Qualifying feature	Effect
Flamborough and Filey Coast SPA		Displacement during operation
	Kittiwake (breeding)	Collision mortality
	Guillemot (breeding)	Displacement during operation
	Razorbill (breeding)	Displacement during operation
Greater Wash SPA	Red-Throated Diver (RTD) (non-breeding)	Construction disturbance and disturbance during cable laying
		Displacement due to operation and maintenance vessel movements
	Little gull (non-breeding)	Collision mortality
Outer Thames Estuary SPA	Red-throated diver (RTD) (non-breeding)	Displacement due to operation and maintenance vessel movements
Haisborough Hammond and Winterton SAC	Sandbanks slightly covered by seawater at all times	Temporary physical disturbance
		Permanent habitat loss
		Introduction of new substrate
	Biogenic reef	Temporary physical disturbance
		Introduction of new substrate
		Increased sediment and smothering
Humber Estuary SAC	Grey seal	Underwater noise (auditory injury and disturbance)
		Collision mortality (vessel interactions)
		Changes to prey resource
		Changes to water quality
		Disturbance at haul-out sites

Site name	Qualifying feature	Effect
Southern North Sea SAC	Harbour porpoise	Underwater noise (auditory injury and disturbance)
		Collision mortality (vessel interactions)
		Changes to prey resource
		Changes to water quality
The Wash and North Norfolk Coast SAC	Harbour seal Grey seal	Disturbance from underwater noise
		Collision mortality (vessel interactions)
		Changes to prey resource
		Changes to water quality
		Disturbance at haul-out sites
Winterton-Horsey Dunes SAC	Grey seal	Disturbance from underwater noise in cable corridor
		Collision mortality (vessel interactions)
		Changes to prey resource
		Changes to water quality
		Disturbance at haul-out sites
Norfolk Valley Fens SAC	Alkaline fens Northern Atlantic wet heaths with <i>Erica tetralix</i> European dry heaths <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> Alluvial forests with <i>Alnus glutinosa</i> and	Indirect effects on features present within ex-situ habitats of the SAC arising from air quality and groundwater/hydrology effects

Site name	Qualifying feature	Effect
	<i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)	
Paston Great Barn SAC	Barbastelle bats	Direct effects on bats present in ex-situ habitats of the SAC (hedgerows/watercourses)
		Indirect effects on bats present in ex-situ habitats from light and groundwater/hydrology effects
River Wensum SAC	Watercourse of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation Desmoulin's whorl snail	Indirect effects within the SAC from geology/contamination/groundwater/hydrology effects
The Broads SAC	Hard-oligotrophic waters with benthic vegetation of Chara spp Alkaline fens. Natural eutrophic lakes with Magnopotamion or Hydrocharition type vegetations Transition mires and quaking bogs Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion,	Indirect effects within the SAC from geology/contamination/groundwater/hydrology effects

Site name	Qualifying feature	Effect
	Alnion incanae, Salicion albae) <i>Molinia</i> meadows on calcareous, peaty or clayey-silt- laden soils (<i>Molinia</i> <i>caeruleae</i>) Desmoulin's whorl snail Fen orchid Ramshorn snail	
	Otter	Direct effects upon ex-situ habitats which may support otter
		Indirect effects upon ex-situ habitats which may support otter arising from changes in groundwater/hydrology conditions

- 6.4.5. The Applicant noted [APP-201, para 77] that grey seal are not currently features of The Wash and North Norfolk SAC or Winterton-Horsey Dunes SAC. However, it was agreed during the Evidence Plan process that they would be included in the assessment as these two SACs are recognised as being important breeding, moulting and haul-out sites. When the Applicant submitted its updated screening matrices at D6 [REP6-005], the grey seal feature had been removed from the matrix for The Wash and North Norfolk SAC. No matrix was included for the Winterton-Horsey Dunes SAC.
- 6.4.6. It does not appear that grey seal is a qualifying feature for these SACs and there is no current consultation on adding them as SAC features in the future. It is the ExA's view that grey seal should not be treated as a qualifying feature of a European site and should not be screened into the LSE assessment.
- 6.4.7. It was initially unclear from the application material if the Applicant had identified LSE for the qualifying features of the Breydon Water SPA and Ramsar site, the Broadland SPA and Ramsar site and the North Norfolk Coast SPA and Ramsar site. In response to a request for clarification from the Inspectorate [PD-002], the Applicant confirmed that LSE should be identified for collision mortality of all the qualifying features of the SPAs, apart from the common tern feature of the Breydon Water SPA and

Ramsar site [AS-002], [AS-003], [REP6-005], [REP6-006] and [REP9-010]. The array of the Proposed Development is stated to be beyond the maximum foraging range for this species. NE welcomed this approach [REP2-080] but also advised that the Ramsar qualifying features are the internationally important wintering waterfowl assemblage, and the overwintering populations of Bewick's swan and lapwing [REP7-050].

- 6.4.8. During the Examination NE and other IPs raised concerns about the potential for LSE on sites or qualifying features which were originally excluded by the Applicant. These concerns were summarised in the RIES [PD-020].
- 6.4.9. The Applicant initially screened out LSE on the Broadland SPA and Ramsar site on the grounds that the bird species which are the qualifying features of these sites had only been recorded in low numbers in the areas likely to be affected by the onshore project works [APP-201] and [APP-203]. NE disputed this as it was not satisfied with the survey data on which the Applicant had relied to support its conclusions [RR-099] and [REP2-080]. While the Applicant maintains that no LSE would arise from the Proposed Development [REP9-010] it revised its screening and integrity matrices [REP6-005 and REP6-007] to include LSE for effects on Bewick's swan, pink-footed goose, Whooper swan, greylag goose and the wildfowl assemblage.
- 6.4.10. NE, in its response to the Applicant's revised matrices [REP7-050] advised that pink-footed goose is not yet a designated feature of the SPA. It also pointed out that no screening matrix had been included for the offshore impacts on the SPA. The Applicant stated that this had been an error [REP9-010] and noted that it had provided an integrity matrix for the offshore impacts [REP6-007] and [REP6-008]. In response to a query in the RIES, the Applicant confirmed that the wildfowl assemblage had been added to the list of features for the SPA/Ramsar site by mistake [REP9-010]. It also provided a revised screening matrix for offshore effects.
- 6.4.11. In its response to the RIES [REP9-010] the Applicant advised that it had included the effects on the pink-footed goose and greylag goose on a precautionary basis. It stated that the pink-footed goose is identified in the second and third SPA reviews (carried out by the Joint Nature Conservation Committee (JNCC)) as a species which should be added to the list of SPA qualifying features. The greylag goose is listed as a species identified as a feature which should be included in the Ramsar listing in future. However, the ExA notes that neither feature has yet been designated as a qualifying feature and there is no current consultation on adding them as features to the SPA and Ramsar sites. It is the ExA's view that these species should not be screened into the LSE assessment for these sites.
- 6.4.12. In its Relevant Representation [RR-054] the RSPB noted that the Applicant's HRA Report [APP-201] had not presented an assessment of the seabird assemblage qualifying feature of the Flamborough and Filey Coast SPA. NE advised that an LSE on the assemblage feature could not

be ruled out because of potential impacts on individual species which are components of the assemblage such as kittiwake, gannet, guillemot and razorbill [AS-029] and [REP9-057]. The Applicant agreed to screen in LSE for operational collision risk and revised its screening matrices accordingly [REP6-005] and [REP6-006].

- 6.4.13. The Applicant initially screened out LSE on the common scoter feature of the Greater Wash SPA. The cable route for the Proposed Development would overlap with the SPA boundary; the Applicant concluded that the distribution data from NE and the JNCC demonstrated that there would be limited overlap between the species and the offshore cable corridor. However following advice from NE that a potential LSE could arise from disturbance and/or displacement of the species during cable installation, the Applicant revised its screening matrices [REP6-005] and [REP6-007] to include this feature. NE confirmed in its response at D4 [REP4-039] that as screening for LSE is a '*coarse filter*', the potential for LSE on this feature should be acknowledged.
- 6.4.14. In its comments on the Applicant's revised matrices [REP7-050] NE queried the Applicant's approach to assessing LSE for Coquet Island SPA and the Farne Islands SPA. For Coquet Island, NE advised that the assessment should note the potential for the auk species which form part of the assemblage feature for this SPA to winter in the North Sea. However, it also noted that the populations migrating through the Proposed Development are likely to be very small relative to the Biologically Defined Minimum Population Scales for the non-breeding season. The Applicant's response to the RIES [REP9-010] noted that the scale of the effect is too small to have a material effect on the outcome of the LSE screening. The ExA agrees with the Applicant's position on this point and so has not considered the effects on the Coquet Island SPA assemblage feature any further.
- 6.4.15. In relation to the Farne Islands SPA, NE advised that the Applicant should include the designated features roseate tern, guillemot and the seabird assemblage (which includes razorbill and puffin). Again, there is potential for the auk species (guillemot, razorbill and puffin) to overwinter in the North Sea. NE advise that the Applicant should consider if there is an impact pathway in the non-breeding season [REP7-050]. The Applicant's response to the RIES [REP9-010] notes that the SPA is almost 400km from the Proposed Development "*and the potential for an impact pathway during the non-breeding season appears to be no greater for this SPA than for any other SPAs that border the North Sea and are located at similar or greater distances from the project and for which it is clear that connectivity is so low that assessment is not warranted*".
- 6.4.16. The ExA agrees that the possibility of LSE on the assemblage present during the breeding season appears to be remote. It is also noted that NE did not pursue the issue or raise any further concerns during the Examination. The ExA does not agree that LSE would arise for the SPA.
- 6.4.17. NE raised concerns that the Applicant had not identified LSE for the sandbanks feature of the HHW SAC as a result of increased suspended

sediment and smothering of this feature, despite the apparent identification of an impact pathway in the ES [REP7-050].

- 6.4.18. In the Applicant's response to the RIES [REP9-010], it was stated that this was an effect that was screened out for the Norfolk Vanguard OWF and this was not disputed during the Examination for that project. The effects of the Norfolk Vanguard OWF are expected, in a worst case scenario, to have a similar effect on suspended sediment as the Proposed Development [REP9-010].
- 6.4.19. In addition, the Applicant states that the assessment presented in the relevant section of the ES [APP-221] established that there would be no impacts because "*the relevant receptors are dominated by processes that are active along the seabed and are not affected by sediment suspended in the water column*". Deposition of material would not cause a detectable change in the sandbanks.
- 6.4.20. The ExA notes the Applicant's position but given NE's advice, concludes that LSE on the sandbanks feature from increased suspended sediment and smothering of this feature cannot be excluded.
- 6.4.21. The Applicant excluded LSE from habitat loss on the reef feature of the HHW SAC as it considers that it would colonise any cable protection. However, in its response to the RIES [REP9-010], the Applicant advised that although it maintains that habitat loss would not lead to LSE, it had screened it in on the advice of NE and updated its screening matrices appropriately [REP6-005] and [REP6-006].
- 6.4.22. The Applicant excluded LSE from direct effects within the River Wensum SAC on the grounds that Horizontal Direct Drilling (HDD) would be used to install the onshore cable under the river [APP-201], [APP-203] and [APP-204]. However, both NE [RR-099] and [REP3-022] and the Environment Agency (EA) [RR-095] raised concerns about the potential damage from leaks of bentonite during drilling. NE advised that this had occurred often enough in previous projects to be considered a likely impact. The EA was concerned that there was insufficient detail to assess the risk of a breakout [AS-026]. The Applicant maintained that LSE could be ruled out because of the commitment to HDD [REP9-010] but screened it in on the advice of NE. The Applicant revised its screening matrices accordingly [REP6-005] and [REP6-006].
- 6.4.23. NE also raised the potential for air quality effects [RR-099] and [REP2-080] on plain to montane levels, white-clawed crayfish, brook lamprey and bullhead features of the River Wensum SAC, based on information provided in the Applicant's ES. The Applicant [AS-024] advised that its assessment of cumulative air quality effects upon designated sites is provided in Chapter 22 Onshore Ecology [APP-235] and Chapter 26 Air Quality [APP-039]. It confirmed that nitrogen deposition is not predicted to lead to adverse effects on any designated site. Traffic numbers assessed in the ES are secured in the Outline Traffic Management Plan (OTMP) [REP4-10]. Following a revision to the OTMP at D5 [REP5-026], text was inserted that committed the Applicant to updating its

assessment of air quality effects on designated sites in the event of increases in vehicle movements. NE confirmed that these commitments are sufficient for it to agree there would be no effects on designated sites [REP5-077].

- 6.4.24. In view of the need to apply the precautionary approach when considering LSE and NE's comments about this stage being a coarse filter, the ExA has concluded that LSE cannot be excluded for the following sites and features.

Site name	Qualifying feature	Effect
Alde-Ore Estuary SPA and Ramsar site	Lesser black-backed gull (LBBG) (breeding) population	Collision mortality during operation
Breydon Water SPA	Bewick's swan (non-breeding) Avocet (non-breeding) Golden plover (non-breeding) Lapwing (non-breeding) Ruff (non-breeding) Waterbird assemblage	Collision mortality during operation
Breydon Water Ramsar	Bewick's swan (overwintering) Lapwing (overwintering) Waterfowl assemblage (winter)	Collision mortality during operation
Broadland SPA	Bewick's swan (non-breeding) Whooper swan	Direct effects on ex situ habitats during onshore construction and decommissioning
		Collision mortality during operation

Site name	Qualifying feature	Effect
	Bittern Marsh harrier Hen harrier Ruff Gadwall Shoveler Wigeon	Collision mortality during operation
Broadland Ramsar	Bewick's swan (non-breeding)	Direct effects on ex situ habitats during onshore construction and decommissioning
		Collision mortality during operation
	Gadwall Shoveler Wigeon	Collision mortality during operation
Flamborough and Filey Coast SPA	Gannet (breeding)	Collision mortality during operation
		Displacement during operation
	Kittiwake (breeding)	Collision mortality during operation
	Guillemot (breeding)	Displacement during operation
	Razorbill (breeding)	Displacement during operation
	Waterbird breeding assemblage	Collision mortality during operation
		Displacement during operation
Greater Wash SPA	RTD (non-breeding)	Construction disturbance and disturbance during cable laying
		Displacement due to operation and maintenance vessel movements
	Little gull (non-breeding)	Collision mortality during operation

Site name	Qualifying feature	Effect
North Norfolk Coast SPA	Great bittern (breeding) Pink-footed goose (non-breeding) Dark-bellied Brent goose (non-breeding) Eurasian wigeon (non-breeding) Eurasian marsh harrier (breeding) Montagu's harrier (breeding) Pied avocet (breeding) Red knot (non-breeding) Sandwich tern (breeding) Common tern (breeding) Little tern (breeding) Waterbird assemblage	Collision mortality
North Norfolk Coast Ramsar site	Great bittern (breeding) Pink-footed goose (non-breeding) Dark-bellied brent goose (non-breeding) Eurasian wigeon (non-breeding) Northern pintail (non-breeding)	Collision mortality

Site name	Qualifying feature	Effect
	Red knot (non-breeding) Sandwich tern (breeding) Common tern (breeding) Little tern (breeding) Waterbird assemblage	
Outer Thames Estuary SPA	Red-throated diver (RTD) (non-breeding)	Displacement due to operation and maintenance vessel movements
Haisborough Hammond and Winterton SAC	Sandbanks slightly covered by seawater at all times Biogenic reef (formed by <i>Sabellaria spinulosa</i>)	Temporary physical disturbance
		Permanent habitat loss
		Introduction of new substrate
		Increased sediment and smothering
Humber Estuary SAC	Grey seal	Underwater noise (auditory injury and disturbance)
		Collision mortality (vessel interactions)
		Changes to prey resource
		Changes to water quality
		Disturbance at haul-out sites
Southern North Sea SAC	Harbour porpoise	Underwater noise (auditory injury and disturbance)
		Collision mortality (vessel interactions)
		Changes to prey resource
		Changes to water quality
	Harbour seal	Disturbance from underwater noise

Site name	Qualifying feature	Effect
The Wash and North Norfolk Coast SAC		Collision mortality (vessel interactions)
		Changes to prey resource
		Changes to water quality
		Disturbance at haul-out sites
Norfolk Valley Fens SAC	Alkaline fens Northern Atlantic wet heaths with <i>Erica tetralix</i> European dry heaths <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)	Indirect effects on features present within ex-situ habitats of the SAC arising from air quality and groundwater/hydrology effects
Paston Great Barn SAC	Barbastelle bats	Direct effects on bats present in ex-situ habitats of the SAC (hedgerows/watercourses)
		Indirect effects on bats present in ex-situ habitats from light and groundwater/hydrology effects
River Wensum SAC	Watercourse of plain to montane levels with the Ranunculion fluitantis and Callitricho-	Direct effects within the ex-situ habitats of the SAC
		Indirect effects within the SAC from

Site name	Qualifying feature	Effect
	Batrachion vegetation Desmoulin's whorl snail White-clawed crayfish Brook lamprey Bullhead	geology/contamination/ground water/hydrology effects
The Broads SAC	Hard-oligotrophic waters with benthic vegetation of <i>Chara</i> spp Alkaline fens. Natural eutrophic lakes with Magnopotamion or Hydrocharition type vegetations Transition mires and quaking bogs Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) Desmoulin's whorl snail	Indirect effects within the SAC from geology/contamination/ground water/hydrology effects

Site name	Qualifying feature	Effect
	Fen orchid	
	Ramshorn snail	
	Otter	Direct effects upon ex-situ habitats which may support otter
		Indirect effects upon ex-situ habitats which may support otter arising from changes in groundwater/hydrology conditions

6.5. CONSERVATION OBJECTIVES

- 6.5.1. The conservation objectives for the European sites assessed by the Applicant at the point of the DCO application were provided in the HRA report [APP-201], except for the Outer Thames Estuary SPA.
- 6.5.2. Conservation objectives for the Outer Thames Estuary SPA and the additional sites discussed above (Broadland SPA/Ramsar site, Breydon Water SPA/Ramsar site and North Norfolk Coast SPA/Ramsar site) were provided in [REP2-024].

6.6. FINDINGS IN RELATION TO ADVERSE EFFECTS ON THE INTEGRITY (AEoI) OF EUROPEAN SITES

- 6.6.1. The Applicant's initial conclusions were that there would be no AEoI of any European site arising from the Proposed Development, either alone or in combination with other plans or projects. These conclusions were disputed during the Examination by several IPs, including NE. These issues are discussed in the following sections of the report.
- 6.6.2. The key areas discussed during the Examination were:
- a. collision risk modelling and displacement assessment methodologies used to assess impacts on SPA qualifying features;
 - b. apportioning of impacts and breeding season definitions for species associated with the Flamborough and Filey Coast and Alde-Ore Estuary SPAs;
 - c. the approach to modelling impacts on the seabird populations of SPAs over the lifetime of the Proposed Development;
 - d. the level of precaution in the assessment of effects on seabird SPA populations;
 - e. the effects of cable protection on benthic ecology;

- f. the capacity to microsite offshore cable to avoid impacts on reef features;
- g. effects of underwater noise on marine mammals;
- h. the appropriateness of Site Integrity Plans (SIPs) to avoid potential AEoI of SACs designated for marine mammals;
- i. the risks of drilling fluid breakout on onshore SACs and SPAs.
- j. the adequacy of the hedgerow mitigation plan; and
- k. effects on ex-situ habitats used by species which are qualifying features of onshore SPAs and SACs.

Ornithology

6.6.3. The Applicant's initial assessments of impacts on offshore ornithological SPA features were presented in [APP-201]. A number of issues were raised by NE [RR-099] and [AS-29] and the RSPB [RR-054]. In response, the Applicant provided an updated ornithological assessment [REP2-035] to address these concerns although the conclusions remained the same as for the Applicant's original assessment. The updated assessment included the following:

- a. presentation of 95% confidence intervals on abundance data to account for variability/uncertainty in the input parameters;
- b. undertaking baseline mortality calculations using the adult colony figures and adult mortality rates for gannet of the Flamborough and Filey Coast SPA;
- c. presentation of an additive assessment of displacement plus collision risk for gannet of the Flamborough and Filey Coast SPA within its assessment of impacts from the Proposed Development alone;
- d. presentation of a range of breeding season collision risk apportionment rates up to 100% for kittiwakes of the Flamborough and Filey Coast SPA;
- e. revision of the method used to apportion in-combination collisions of lesser black backed gull of the Alde-Ore Estuary SPA in the breeding season;
- f. a review of the figures used in the in-combination collision risk assessment – to address incorrect figures and missing OWFs;
- g. a revision of the assessment of in-combination displacement effects for red-throated divers;
- h. use of apportionment rates agreed during the assessments of individual OWF projects, rather than a generic 30% apportionment rate for the in-combination collision assessment for lesser black backed gull of Alde-Ore Estuary SPA; and
- i. presentation of the in-combination assessments with and without the inclusion of Hornsea Project Three OWF and Hornsea Project Four OWF (due to uncertainty around their in-combination contributions resulting from the lack of a full baseline dataset).

6.6.4. NE [REP4-040] had some outstanding concerns with the Applicant's approach presented in [REP2-035], however it confirmed that the Applicant's revised approach considers the distance of each of the relevant OWFs and the other colonies within foraging range of the OWFs which it deemed more appropriate than the original approach.

6.6.5. The Applicant's original assessment [APP-201] used the Band (2012) collision risk model. NE [RR-099] and [REP16-011] agreed that use of the Band model Option 2 was appropriate but advised that this approach does not allow for uncertainty and/or variability to be incorporated. It recommended that the Marine Scotland Science (MSS) stochastic collision risk model (CRM) be used for any further modelling. However, it was subsequently noted by both the Applicant [AS-024] and [REP16-011] and NE [REP2-080] and [REP16-011] that there were issues with the MSS model. NE advised that if the issues with the model were not resolved by the end of the Examination, then

"...we will base our advice on the ranges of predictions on the variation of bird density for the parameter that predicts the greatest uncertainty in the predictions for the variations of Band model outputs, which is the variation of bird density".

6.6.6. On a number of occasions during the Examination, NE [RR-099], [REP2-080], [REP4-039] and [REP4-043] and the RSPB [RR-054] advised that raising the wind turbine generator (WTG) draught height would reduce the collision mortality from the Proposed Development and minimise its contribution to the in-combination collision totals.

6.6.7. At D5, the Applicant [REP5-001] confirmed that it had committed to removing the 10MW and 11MW turbines from the project design envelope, therefore the smallest turbine would be 11.55MW. This resulted in changes to the dDCO parameters including:

- a. a reduction in the maximum total number of turbines to be installed from 180 to 158;
- b. an increase in minimum spacing between wind turbine generators from 760 metres to 800 metres; and
- c. an increase in minimum draught height from 22m to 30m for WTGs rated at 14.7MW and above, and 35m for WTGs up to and including 14.6M (secured through rDCO Part 3 Requirement 2(1)(e)).

6.6.8. The Applicant provided updated CRM for the Proposed Development alone [REP5-059] and in combination [REP6-024]. NE [REP7-047] raised queries about errors in the calculations [REP6-024] to which the Applicant provided a corrected version at D8 [REP8-025] and [REP8-026]. The Applicant noted that the collision risk estimates for both the Proposed Development alone and in combination were greatest for the 14.7MW turbine with a 30m draught height so this represented the worst case scenario.

6.6.9. The RSPB [REP3-028] advised that the issues with the stochastic model had been resolved but the Applicant did not employ this approach in the updated CRM undertaken after the design envelope for the Proposed Development changed.

6.6.10. Contributions to in-combination effects for some projects were adjusted in response to advice from NE as follows:

- a. For Dogger Bank Creyke Beck A and B OWFs the figures for the full consent were used rather than those for the project's non-material change application.
- b. For Hornsea Project Three OWF the figures used were based on those used in Examination and did not take account of the proposed post-Examination changes to the project.

6.6.11. The Norfolk Vanguard OWF design was amended in the same way as the design of the Proposed Development so the collision figures associated with Norfolk Vanguard OWF were reduced accordingly. The figures for Hornsea Project Four OWF were based on the figures in the project's Preliminary Environmental Information Report (PEIR).

6.6.12. Where figures for CRM and displacement have been updated during the Examination, the ExA has relied on the revised figures rather than those presented in the Applicant's original assessment [APP-201].

Population Viability Analysis

6.6.13. The Applicant [APP-201] assessed the significance of the predicted in-combination collision impacts by reference to the population viability analysis (PVA) undertaken during the Norfolk Vanguard OWF examination for lesser black-backed gull at the Alde-Ore Estuary SPA; and the PVAs undertaken during the Hornsea Project Three OWF examination for gannet, kittiwake, razorbill and guillemot of the Flamborough and Filey Coast SPA.

6.6.14. NE [RR-099] and [REP4-039] highlighted concerns with the Hornsea Project Three OWF PVA relating to the number of simulations and demographic data. It also identified concerns with the lesser black-backed gull PVA, namely regarding the adjustment of the productivity data to take account of the proportion of birds that miss breeding each year. However, it considered these models to represent the best available evidence on which to base an assessment but recommended the Hornsea Project Three OWF models be updated using the NE commissioned Seabird PVA Tool once updates to it are completed. At D7, NE confirmed the update was available as of 3 March 2020 and advised that the models be re-run.

6.6.15. The Applicant [REP7-031] presented modelling for the kittiwake population at the EIA population scale and guillemot for the Flamborough and Filey Coast SPA population using the updated PVA tool, with model runs of 1,000 and 5,000 simulations. The counterfactual outputs were compared with those produced by 500 runs (as in [REP2-035]) and were stated to be virtually indistinguishable from the longer model runs [REP7-17], [REP8-016] and [REP8-027].

6.6.16. The Applicant [REP7-018], [REP8-015] and [REP8-016] also referred to NE's comments at D5 [REP5-077] that NE was not aware that updates to the model would make a significant difference to the counterfactual metric outputs of models run using the previous/currently available versions of the tool. The Applicant [REP7-017], [REP8-015] and [REP8-

016] therefore considered the current outputs in [REP2-035] to be robust and appropriate.

- 6.6.17. NE noted [REP9-042], [REP9-049] and [REP9-057] that the Applicant had not re-run the PVAs for the lesser black-backed gull population of the Alde-Ore SPA or the gannet, kittiwake, and razorbill features of the Flamborough and Filey Coast SPA. Its concerns about the Applicant's PVAs remained. NE stated [REP9-057] that its comments in [REP5-077] only related to the EIA scale PVA models and the guillemot PVA model for the Flamborough and Filey Coast SPA.

Density dependence and independence

- 6.6.18. The Applicant's HRA Report [APP-201] presented population modelling results for both density dependent and density independent models. It considered that the density dependent model was more realistic for gannet and kittiwake. For guillemot, razorbill and lesser black-backed gull, the Applicant drew its conclusions using the density independent model, which it considered to be more precautionary.
- 6.6.19. The Applicant [REP2-035], [REP3-003] and [REP5-051] considered that density independent models are biologically unrealistic as they permit unlimited population growth. It explained that density dependence is known to exist in seabird populations and that a density dependent PVA generates more realistic predictions. It presented outputs from both models in its D2 Ornithology Update [REP2-035].
- 6.6.20. NE [REP4-039] and [REP5-007] and the RSPB [AS-041], [REP9-052], [REP10-068] and [REP15-013] both acknowledged that density dependence is likely operating at seabird colonies. However, they considered the density independent model outputs to be the most appropriate as there is no clear evidence to support the application of any particular form or magnitude of density dependence; therefore, there is no way of verifying whether predictions from a density dependent model are robust or accurate. The RSPB [REP9-052] and [REP15-013] also noted that density dependence can also lead to a slowing in population growth at very small population sizes.

Counterfactuals

- 6.6.21. The Applicant's HRA Report [APP-201] presented both the counterfactual of growth rate and the counterfactual of population size.
- 6.6.22. NE [REP4-039] recommended that both metrics of the counterfactual of population growth rate and the counterfactual of population size be considered to quantify the relative changes in a population in response to anthropogenic impacts. It reported on both metrics in its ornithology advice [REP4-040].
- 6.6.23. The RSPB [REP2-035], [AS-041] and [REP9-052] advised that the counterfactual of population size is most appropriate for a density independent PVA (which it advocated), as the counterfactual of growth rate does not account for a high probability that future population growth

rate will be different from the current growth rate. It defined the counterfactual of population size as describing the size of the population predicted after a period of time in the additional mortality arising from the OWF is included.

- 6.6.24. The RSPB [REP9-052] considered that the Applicant had misapplied the counterfactual of growth rate output by setting it against the recent growth rate of the SPA colony. The counterfactual approach should be relatively insensitive to changes in population demographics. The Applicant's approach does not account for the probability that the future population could be different from the current rate.
- 6.6.25. The Applicant [REP3-003] and [REP5-051] agreed that counterfactual of population size is most appropriate for the density independent model but considered that a counterfactual of population growth is the more robust metric to use for its preferred density dependent model. It presented both outputs in its D2 ornithology update [REP2-035].
- 6.6.26. The Applicant's preferred metric was the counterfactual of population growth. It argued that it can be compared to population trends and is a measure of the population's resilience and ability to regenerate. The counterfactual of population size is more sensitive to the predicted population trend [REP2-035].
- 6.6.27. The RSPB [REP9-052] argued that the Applicant had misapplied the counterfactual of population growth by comparing the predicted change in population growth rate in 30 years' time against the current population growth rate as it is impossible to determine what the future growth rate would be.

In-combination assessments - inclusion of data from Hornsea Project Three and Hornsea Project Four OWFs

- 6.6.28. Throughout the Examination, NE [RR-099], [REP7-047] and [REP9-057] noted concerns regarding incomplete baseline surveys for the Hornsea Project Three OWF and the associated level of uncertainty as regards the potential impacts of that project. It also noted [REP7-047] that the best currently available figures for Hornsea Project Four OWF are those from the PEIR for this project and that these figures and the methodologies to produce them are subject to ongoing discussions and therefore have an element of uncertainty associated with them and a likelihood of being subject to change.
- 6.6.29. NE's major concern [REP7-045] and [REP9-049] was that as there is uncertainty about the data included for the in-combination assessment totals for Hornsea Project Three OWF and Hornsea Project Four OWF, the magnitude of in-combination effects which include these OWFs is not clear. The Applicant presented figures showing the in-combination effects with and without the inclusion of these two projects.
- 6.6.30. The HRA produced by the SoS for the Norfolk Vanguard OWF [REP13-023] stated that it had considered NE's concerns over the incomplete baseline data for Hornsea Project Three OWF:

"The Secretary of State has considered the concerns raised over the incomplete baseline ornithology data raised during Examination of the Hornsea Project Three project. He is also aware of supplementary aerial survey data collected between January and March 2019 to determine whether there was variability in the density of key species that was significantly different to that assumed in the application and examination of Hornsea Project Three. The subsequent assessment showed that the predicted number of gannet collisions incorporating the additional data were identical to those previously assessed (Ørsted 2019). Consequently, he does not agree with the concerns raised regarding the incomplete baseline surveys and their use in the in-combination impact assessment".

Degree of precaution in assessments

- 6.6.31. The Applicant considered that many of the methodological updates requested by NE added further layers of precaution to an already precautionary assessment. The Applicant considered that not applying NE's recommendations would reduce collision estimates by 42% for large gulls, 32% for kittiwake and 19% for gannet [REP2-035]. The various points where the Applicant considered that additional layers of precaution were being applied are discussed below.

Avoidance rates

- 6.6.32. The Applicant [REP2-035] considered that currently advised avoidance rates used in CRM are too low. NE [REP4-039] agreed that some evidence suggests this is the case and noted that SNCBs are currently reviewing this; nevertheless, its position remained to use those advocated in current SNCB guidance note (98.9% for gannet and kittiwake in Band model Option 2).
- 6.6.33. The RSPB [AS-041] highlighted limitations in the evidence presented by the Applicant and advised that avoidance rates could go down as well as up. In particular, it did not agree with the Applicant's use of a 98.9% avoidance rate for gannet [RR-054], [REP2-095], [REP3-028], [AS-041] and [REP15-013]. It advised a 98% rate be applied for the breeding season to reflect time and energy constraints on foraging birds. It noted that the 98.9% rate was based on avoidance behaviour from non-breeding gannets. The Applicant [REP2-021], [REP3-003], [AS-041], [REP5-051] and [REP9-010] explained that the 98.9% rate was advised by NE and considered there was robust evidence to support its use. The Applicant did not amend the avoidance rate used in its updated assessments and NE [REP2-080] confirmed that it agreed with the Applicant's 98.9% rate.

Extent of displacement effects

- 6.6.34. The Applicant [REP2-035] and [REP5-051] considered NE's advice to assess displacement rates of 30% to 70% across the OWF and a 2km buffer to be over precautionary. It concluded that an evidence based, but still precautionary, assessment of displacement of auks by OWFs might assume that their densities would be reduced inside OWFs by 50% relative to densities in the surrounding area, and by 30%, on average,

across a 1km buffer zone surrounding the OWF. It also considered that increasing space between larger turbines would be likely to reduce displacement rates as there would be considerable opportunity for species to forage between turbines.

- 6.6.35. However, NE [REP4-039] noted that evidence for auk displacement is variable, therefore reiterated its advice that consideration should be given to a range of displacement rates. It did not agree that there was evidence to support a position that spacing and turbine size has a bearing on displacement and considered that turbine spacing may be one of several variables that could influence displacement effects. The RSPB [AS-041] cited additional studies which supported the values in the range recommended by NE.
- 6.6.36. The extent of a bird population that would die following displacement was also disputed. The Applicant [REP2-035] and [REP5-051] acknowledged that the consequences of displacement are less well understood than rates of displacement and noted that NE adopts precautionary values in the range of 1 to 10%. However, it considered realistic levels of mortality for displaced birds would be less than 1% for all species considered.
- 6.6.37. NE [RR-099], [REP2-080] and [REP4-039] stated that definitive mortality rates are not known and that mortality rates are a crude method of capturing the range of potentially deleterious effects that could arise from displacement, including reduced fitness for migration and reduced productivity during the breeding season. It stated that empirical evidence of energetic consequences of displacement is limited and the role of overwinter survival on population dynamics is poorly understood. It considered there to be no evidence to suggest that 10% is a precautionary mortality rate.
- 6.6.38. In respect of auks, NE stated that although mortality is likely to be at the low end of the range, it did not agree the Applicant's approach was sufficiently precautionary. Similarly, it did not agree that a 1% mortality rate for red-throated diver from offshore export cable laying to be sufficiently precautionary.
- 6.6.39. The RSPB [REP2-095], [REP2-096] and [REP15-013] supported NE's position. It noted [AS-041] and [REP15-013] that the Applicant's evidence does not acknowledge energetic bottlenecks in winter. The higher weights of birds during the non-breeding period can be seen as part of recovery and preparation for breeding. The RSPB did not agree that this means that birds can be subjected to greater disturbance without consequence.
- 6.6.40. The RSPB also noted that the Applicant suggests current estimates of red-throated diver mortality include occurrences resulting from shipping activity and that additional mortality arising from displacement from OWFs is likely to be small. The RSPB stated that recent evidence suggests that the extent of displacement caused by OWFs is far greater than that arising from shipping traffic [REP15-013].

Consented versus as-built OWFs

- 6.6.41. The Applicant's HRA Report [APP-201] highlighted that applying as-built OWF designs to the in-combination collision risk assessment would reduce predicted mortality by at least 40% when compared to using figures for the 'as-consented' OWF designs.
- 6.6.42. The RSPB [RR-054], [REP2-096] and [REP9-052] and NE [REP2-080] and [REP4-039] suggested that it is not appropriate to consider as-built OWFs unless the outcome is legally secured and the CRM is re-run with final design parameters.
- 6.6.43. The Applicant [REP6-021] confirmed that it was not reliant on such headroom to reach conclusions of no AEoI but stated that it is a notable source of over-precaution in the in-combination assessment. It noted that because project design revisions often occur post consent as technological developments mean generating capacities can be attained with fewer, larger dimension turbines; consented values do not reflect the reality of seabird collision risk. It stated [REP2-021] and [REP3-003] that a developer would require additional planning consent for further construction work, noting that construction is defined in the dDCO and once completed further construction works would require a new Marine Licence and updated ES. It explained that new turbines would not be installed between existing ones (due to impacts on air flow) and that order limits can only be extended with a new application. It therefore considered headroom to be legally secured [REP6-021].
- 6.6.44. The Applicant [REP6-021] considered there to be a straightforward method for calculating change in collisions with a correction rate and provided a worked example for Hornsea Project One OWF [Appendix 4 of REP4-014] and Triton Knoll OWF [Annex 1 of REP6-021] based on a tool developed for the Crown Estate which can be used to update the original collision predictions. The Crown Estate maintains a database of OWF designs, consented and actual which automatically updates collision predictions.
- 6.6.45. NE [REP6-049], [REP7-051] and [REP9-049] recognised that there is likely to be some headroom, but that the extent is not agreed. It agreed in principle that if a non-material change or Section 36 variation has reduced consented parameters, this could be considered legally secured. However, it noted [REP4-043] and [REP6-049] that the projects referred to by the Applicant do not have a condition/requirement requiring information on as-built parameters on completion to be submitted, or to clearly specify that the as-built project becomes fixed for lifetime, and that there are no limitations for timings of subsequent phases.
- 6.6.46. NE cautioned [REP6-049], [REP9-042], [REP9-049] and [REP13-038] regarding the revised collision numbers calculated for Hornsea Project One OWF. It raised concerns about the bird density data, the use of figures from the Band model Option 1 and the use of flight-specific flight heights.

- 6.6.47. NE [REP6-049], [REP7-047], [REP7-051], [REP9-010] and [REP13-038] identified a number of concerns with the Applicant's proposed approach, including potential issues with the age of data, how it was collected and its compatibility with current survey platforms and modelling approaches. It considered that the developers of the projects in question should have a right to reply on what they think the as-built collision risk is for their project and that CRM should be re-run to generate updated collision figures against any agreed changes to turbine design layouts, with full calculation details for any correction factors. It also [REP9-042] noted that the Applicant's approach has not been subject to legal scrutiny.
- 6.6.48. NE considered that until uncertainties have been addressed and an industry wide approach is agreed [REP9-042] and [REP13-038], the default approach of using consented designs should be applied. It also noted that even if there is headroom, there are projects ahead of the Proposed Development in the examination process that are not yet consented, therefore the headroom is not necessarily available for the Applicant to utilise.
- 6.6.49. The RSPB [AS-041] considered that the Crown Estate report upon which the Applicant's proposed approach was based was flawed and not designed for use in assessment. Until an industry-wide approach has been agreed [REP9-052], the figures used should be based on the consented rather than 'as built' designs. It disagreed [REP9-052] with the concept of headroom altogether as it considered that it treated the birds which constitute the headroom as being expended.
- 6.6.50. The Applicant [REP7-017] acknowledged collision mortalities from as built windfarms could also increase for some windfarms but stated that the effect of this is very small and is far outweighed by reductions for other sites. It believed that it had demonstrated Triton Knoll and Hornsea One OWFs alone create sufficient headroom for both Norfolk Vanguard OWF and the Proposed Development [REP7-017] and [REP8-016]. However, it recognised that it was unlikely that agreement on the extent of available headroom would be reached during the Examination. It stated that its assessment was not reliant upon headroom but considered it to be one example of over precaution in NE's approach. It also stated [REP8-015] that NE in a previous response [REP6-049] had agreed in principle to the Applicant's approach so NE's concerns related to the data used rather than the method itself.
- 6.6.51. The MMO supported NE's position. It advised [REP7-040] that it had received legal advice and was satisfied that the consented figures can be used. It did not agree that 'as built' figures could be used. It also noted that for the Hornsea One, Triton Knoll and Race Bank OWFs the relevant consents did not include a specific requirement to provide confirmation on the completion of construction of the final as-built structures. The Applicant [REP8-015] stated that Race Bank OWF did not make any contribution to the figures. Hornsea One OWF had been built out to its maximum consented capacity so no notification from the developer was necessary.

Nocturnal activity

- 6.6.52. The Applicant [REP2-021] and [REP2-035] explained that tagging studies showed that most OWF collision assessments have used overestimates of nocturnal activity and that adjustments for these for consented OWFs would reduce collision risks by up to 30%.
- 6.6.53. NE [REP4-039] stated that offshore surveys would have missed peak activity around dawn and dusk, therefore it is not appropriate to apply empirically derived rates from tracking studies to offshore survey recorded results. It also considered it not appropriate to adjust CRM for other OWFs without re-running the CRM.
- 6.6.54. The RSPB [REP3-028], [AS-041] and [REP15-013] considered that the nocturnal activity parameters preferred by the Applicant do not all take into account seasonal fluctuations in temporal activity patterns, do not account for the lack of survey effort during crepuscular peaks in activity and do not account for the differences in how the Band model defines daylight with other definitions of twilight and night time, particularly how these affect behaviour.
- 6.6.55. Although the Applicant [REP5-051] considered there to be a robust evidence base supporting the use of the revised nocturnal rates, it confirmed that it had followed NE's advice on selection of nocturnal activity rates in its assessments.

Predictions using upper 95% Confidence Intervals (CI)

- 6.6.56. The Applicant [REP1-042] and [REP2-035] considered NE's request to use 95% CIs for project alone collision impacts fails to acknowledge the low likelihood (2.5%) of the upper prediction occurring. It noted [REP5-051] that an emphasis tends to fall on upper CI predictions without the balance of the lower prediction and that this is not statistically justified
- 6.6.57. However, NE [REP4-039], [REP4-040] and [REP4-043] stated that the distribution of birds in marine environments are highly variable and that 24 days survey effort over two years would not likely capture the full extent of variation in the density/abundance of seabirds present; therefore it is appropriate for lower and upper CIs to be presented to address uncertainty. It further stated that it understood [REP5-077] that the central predicted value is carried forward to in-combination assessment, rather than upper figures for collision. It did not agree this resulted in over-estimated impact magnitudes. Assessments are underpinned by a number of assumptions which may have a degree of uncertainty associated with them, making a range-based approach appropriate [REP9-042].
- 6.6.58. The RSPB [AS-041] supported NE's request for an indication of uncertainty around estimates of abundance in order to give consideration to the variability in the underlying annual population estimates. It stated that provision of 95% CIs allows an understanding of the degree of variability and uncertainty in the annual population estimates. It should

not affect the actual conclusions as these should be based on means or other central measures [REP15-013].

- 6.6.59. The Applicant also identified further sources of precaution in the ornithological assessments in relation to kittiwake flight speeds, breeding season apportionment and combining displacement mortality and collision mortality for gannet. These points are discussed in more detail under the sections on the Alde-Ore Estuary and Flamborough and Filey Coast SPAs.

Additive precaution

- 6.6.60. The Applicant [REP1-042], [REP4-014] and [REP6-014] acknowledged that individual components of precaution may be justified, but the combination of these generates predictions which are highly over precautionary. It felt that NE had not acknowledged this point [REP8-015], [REP9-010] and [REP13-013]. In its view [REP13-013], the SoS decision on the Norfolk Vanguard OWF supported its position about over-precaution in offshore ornithological assessments.
- 6.6.61. NE responded [REP9-042] and [REP9-057] that its understanding was that the in-combination assessments used the central/mean predicted value for mean bird density, avoidance rate and flight height rather than the upper figures from any predicted range. In the case of the Round 1 and Round 2 OWFs this cannot be done as the information is not provided in the project environmental statements. It noted that not all the elements of an assessment are likely to be precautionary. The level of uncertainty in the assessment is high, leading to a need to be precautionary in the assessment of impacts.
- 6.6.62. NE [REP13-038] provided further detail at D13 on areas of variability and uncertainty within aspects of the Applicant's assessments. These were:
- a. Assessment are based on 2 years of survey data which may not be sufficient to pick up variations in distribution, density and abundance of seabirds within the survey area.
 - b. Empirical evidence is limited for many areas including for avoidance rates and mortality rates from bird displacement.
 - c. Difficulties in recording site-specific data on seabird flight heights leading to reliance on generic data potentially lead to underestimates of collisions.
- 6.6.63. The RSPB [REP10-068] and [REP13-049] supported NE's position. It advised that the lack of robust data underpinning the assessment and population data required the use of a precautionary approach.

ExA's conclusions on the extent of precaution in the ornithological assessments

- 6.6.64. The ExA agrees that NE's recommended approach incorporates a number of elements of precaution. However it is unlikely that the two years of baseline surveys could capture the full range of variability in bird distribution, density and abundance using the sea areas affected by the Proposed Development so it is appropriate that a degree of precaution is

applied to the assessments. The ExA agrees with NE's advice that a range of input values should be employed rather than relying on a mean or central value for key parameters such as bird density.

- 6.6.65. There may be an additive effect which leads to overly cautious predictions of effects as the Applicant suggests. Unfortunately, it does not appear to the ExA that the current level of knowledge on OWF ornithological impacts allows an accurate determination of which elements of an assessment are likely to be over-precautionary. This leaves the competent authority facing a situation where the predictions of effects on ornithological receptors may be an over-estimate but where it is not possible to quantify the extent of any such over-estimation or to understand the implications for particular populations.
- 6.6.66. This concern also applies to the consideration of the effects of consented versus as built OWFs. The ExA agrees that, in principle, assessments could be adjusted where the alteration has been legally secured or where any further expansion of turbines would require a further consent. However, it is clear that at present a consensus has not been reached on how such reductions in effects could be assessed.
- 6.6.67. The ExA concludes that, notwithstanding the SoS conclusions in relation to the Norfolk Vanguard OWF Habitats Regulations Assessment, it can only give limited weight to the Applicant's arguments about over-precaution in the assessment.

Alde-Ore Estuary SPA and Ramsar site

- 6.6.68. The only effect under consideration at this SPA/Ramsar site was the result of collision risk mortality during operation on the lesser black-backed gull population of the SPA, alone or in combination with other OWF. Following the changes to the design envelope, the total annual number of collisions predicted for the Proposed Development alone would be 14.3 birds (1.4 – 38.9 95% CI) of which a proportion would be associated with the SPA [REP5-059, Table 2.4].
- 6.6.69. The Applicant presented a range of apportionment values from 10-30%, which Natural England (NE) confirmed was appropriate [REP4-040] and [REP5-077]. However, the Applicant suggested that 21% of the breeding season collisions at the Proposed Development would be attributed to the Alde Ore Estuary SPA/Ramsar site population, based on a review of population estimates in Norfolk and Suffolk, combined with use of the Scottish Natural Heritage (SNH) apportioning method [REP2-035]. NE advised that a 30% apportionment was more appropriate which the Applicant argued was overly precautionary [REP8-025] and [REP8-026]. NE acknowledged that a 30% apportionment rate is likely to be overly precautionary [REP5-077].
- 6.6.70. The RSPB [REP2-096] considered that it is not safe to assume birds from urban colonies forage at sea to the same extent as rural coastal colonies; it suggested apportioning rates of 24.1% if urban birds are included and 38.8% if excluded. It recommended [REP3-028] and [REP5-083] a range

of rates up to 40% be provided to capture the full extent of the population from the SPA foraging within the Proposed Development and to take into consideration different behaviours of urban birds and coastal breeding birds.

6.6.71. The Applicant concluded that during the autumn and spring migration periods, birds from the SPA/Ramsar site make up 3.3% of the Biologically Defined Minimum Population Scales (BDMPS), and in winter these birds make up 5% of the BDMPS [APP-201]. It calculated figures for breeding, non-breeding and total annual collisions apportioned to the SPA, using its preferred methods and the methods preferred by NE [Table 2.7, REP5-059].

6.6.72. The figures for the 14.7MW turbine with a draught height of 30m were:

	Spring collisions	Breeding collisions	Autumn collisions	Midwinter collisions	Annual total
Applicant's preferred figures	0 (0 - 0 95% CI)	1.3 (0.2 – 0.3 95% CI)	0.2 (0 – 0.6 95% CI)	0 (0 – 0.1 95% CI)	1.6 (0.3 – 3.9 95% CI)
NE's preferred figures	0 (0 - 0 95% CI)	1.9 (0.4 – 4.6 95% CI)	0.2 (0 – 0.6 95% CI)	0 (0 – 0.1 95% CI)	2.1 (0.4 – 5.3 95% CI)

6.6.73. The Applicant [REP8-027] considered that if an apportionment rate of 40% was used, as advised by the RSPB, this would increase the annual collision mortality to 2.7 individuals per year.

6.6.74. The Applicant [REP6-007] stated that natural mortality for the SPA/Ramsar site population (assuming approximately 4,000 adults) would be around 460 individuals at an average adult mortality rate of 11.5%. A total additional worst case mean annual mortality of up to 1.6 (using the Applicant's preferred breeding season rate of 21%) or 2.1 (using NE's preferred rate of 30%) birds due to collisions at the Proposed Development site would increase the mortality rate by 0.3 to 0.4%.

6.6.75. The Applicant's PVA modelling of 15 adult mortalities per year [REP2-035] predicted the population growth rate would be 0.4% lower (0.996) than the baseline using the density independent model, and 0.1% lower (0.999) using the density dependent model. The Applicant considered these levels of mortality would be unlikely to have a detectable effect on the population [REP2-035].

6.6.76. Even without the reduction in collisions the Applicant [REP2-035] concluded that the collision related mortality from the Proposed Development alone would not lead to AEOI of the SPA/Ramsar site. NE

[EV9-003], [REP7-048], [REP7-050], [REP9-010] and [REP16-011] agreed with the Applicant's position.

- 6.6.77. The RSPB [REP16-014] remained concerned about the apportioning rates used in the Applicant's assessment. However, it agreed [REP16-014] that the changes in the design of the Proposed Development and the consequent reduction in collision figures in [REP5-059] made it possible to agree that AEoI would not arise from the Proposed Development alone.
- 6.6.78. In relation to in-combination effects the Applicant [REP6-024], [REP8-025] and [REP8-026] calculated that 54.2 annual collisions would be apportioned to the SPA (a decrease from the 57 annual collisions predicted in [REP2-035]). The Applicant [REP6-007] stated that compared with an estimated natural mortality of about 460 birds per year, the additional in-combination mortality would increase the mortality rate by 11.8%. Accounting for built vs. consented OWF designs, the Applicant stated that this would reduce collision estimates to around 60% of the unadjusted values [REP2-035]. These estimates were not revised to reflect the reduction in collision numbers following the changes to the design of the Proposed Development.
- 6.6.79. The Applicant's population modelling [REP2-035] calculated that at an adult mortality of 55, the growth rate of the population would be reduced by 0.3% to 1.4% (for density dependent and density independent simulations respectively) after 30 years. At a mortality of 35 (reflecting the Applicant's as-built estimate) the growth rate of the population would be reduced by 0.2% to 0.9% (for density dependent and density independent simulations respectively). No collisions were attributed to the Hornsea Project Three OWF and Hornsea Project Four OWF, a position that NE endorsed [REP13-038].
- 6.6.80. The Applicant concluded that even at the more precautionary, density independent prediction for a higher mortality of 55, based on consented rather than built OWFs and using over-estimated nocturnal activity rates, the growth rate reduction would be less than 1.5%; it considered that this is very unlikely to cause a population decline [REP2-035].
- 6.6.81. NE considered [REP7-047] that assessments of the effect on population size should consider a range of growth rates (1 – 5%), while noting that it was uncertain as to whether there would be any growth. It concluded that:
- a. With a -2% per annum growth rate, a stable population or a 1% per annum growth rate then 55 additional mortalities per annum would lead to the population declining below its current level.
 - b. With a growth rate of 2% then 55 additional mortalities would lead to the population being 2,400 birds fewer at the end of 30 years. It would take 145 years to reach the target population of above 14,000 pairs.
 - c. With a growth rate of 3% per annum, an additional mortality of 55 birds per annum would lead to the population being approximately

3,300 birds fewer than without the additional mortality. It would take an additional 35 years to reach the target population compared with a situation where no additional mortality occurred.

- 6.6.82. The Applicant acknowledged that the SPA/Ramsar site population is much smaller than the designated size (and has been since 2001), apparently as a consequence of various factors including changes in farming practice in the region and a shift of rural gull populations to urban locations. In the Applicant's view while there is a risk that the in-combination mortality would delay the time to achieve the conservation objective of restoring the population to 14,000 pairs, the actual contribution to this delay resulting from the in-combination mortality would be very small. It considered other factors have reduced the population and are likely to continue to be the primary drivers in determining the population status [REP2-035].
- 6.6.83. The Applicant considered that as other factors are driving the decline of the population and the degree of precaution in reported collision assessments for other OWFs means the likelihood of an adverse effect on the integrity of the SPA can be ruled out [REP6-007]. The Applicant also noted that the current in-combination estimate of 54 is well below that of the consented Galloper OWF with an in-combination collision risk estimate of 85. It considered [REP8-016] that as NE had agreed that an apportionment rate of 30% was precautionary, the contribution from the Proposed Development was likely to be less than 2 birds per annum. It queried how small the contribution from the Proposed Development would have to be for it not to be a relevant contribution [REP8-016]. The effects from the Proposed Development would contribute 2.7% of the cumulative total of collisions [REP8-027].
- 6.6.84. NE and the RSPB did not agree with this conclusion. NE [REP7-047] and [REP13-038] estimated that the contribution to the cumulative number of collisions would be 4% which it views as a meaningful contribution to the total. NE [REP4-040], [REP7-045], [REP7-047], [REP13-013] and [REP14-066] advised that the conservation objective is to restore the size of the breeding population whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent and that any additional mortality from the OWFs should be considered in addition to any existing impacts on the colony. It stated that the population is currently stable at best and that there is no evidence to suggest that the future population trend would be significantly different from the current trend. It considered the additional mortality from the OWF would reduce population growth rate which would be counter to the restoration conservation objective, even if more optimistic assumptions about the population trend of the colony are made
- 6.6.85. The Applicant submitted the SoCG with East Anglia THREE OWF [REP8-017] which demonstrates that NE had previously agreed that an in-combination collision mortality of 58 lesser black-backed gull (LBBG) would not lead to an adverse effect on the integrity of the SPA, with East Anglia THREE OWF contributing 1.8 collisions to that total. [REP8-027]

- 6.6.86. NE responded [REP9-049] that assessment methodologies and understanding of impacts associated with OWF, particularly the interpretation of PVA outputs and counterfactual metrics, has altered in recent years. Since the East Anglia THREE OWF Examination NE has published formal conservation advice and a revised objective to restore the SPA's population. It did not consider [REP9-057] that any reductions in predicted impacts based on 'as built' designs should be taken into account in an appropriate assessment unless those reductions have been legally secured.
- 6.6.87. The RSPB [AS-041] and [REP5-083] stated that irrespective of whether 40% apportionment is applied, it cannot agree there would be no AEoI from in-combination effects. Based on the PVA metric of counterfactual of population size, it calculated that the in-combination mortality would result in a population decrease of around 33.1% over the lifetime of the Proposed Development (relative to the population size in the absence of OWF in-combination effects) [REP9-052]. The RSPB advised [AS-041] that the consent for the Galloper OWF had included provision for mitigation measures designed to increase the productivity of the SPA colony but this had not proved possible to achieve. It noted [REP9-052] that it had never agreed that AEoI could be excluded for the Galloper OWF. NE advised that the measures to address the effects from Galloper were at the scoping stage [REP9-057].
- 6.6.88. The RSPB [REP10-068] considered that even if the reductions in mortality advocated by the Applicant were taken into account the LBBG population of the SPA would be 17% lower than it would have been in the absence of in-combination effects.
- 6.6.89. The Applicant [REP13-013] noted that the SoS decision on the Norfolk Vanguard OWF had concluded that the contribution of that OWF to the in-combination collision mortality was so small as to be de minimis. Using NE's preferred method of calculating collision numbers, Norfolk Vanguard OWF contributes 2.6 collisions per annum to the in-combination total compared with 2.1 collisions from the Proposed Development. The Proposed Development is further from the SPA than the Norfolk Vanguard OWF so connectivity is expected to be lower. As the contribution to the in-combination total from the Proposed Development is smaller than a contribution deemed to be de minimis by the SoS, the Applicant considered that this supported the conclusion of no AEoI of the SPA.
- 6.6.90. NE [REP13-038] and the RSPB [REP13-049] advised that their position had not changed following the SoS decision on Norfolk Vanguard OWF. NE [REP14-064] expressed concerns about the concept of de minimis effects in relation to in-combination effects, particularly where impacts have already reached a level where the integrity of a site is already affected. It stated that it had previously advised that AEoI of the SPA/Ramsar site from in-combination collision risk mortality cannot be excluded. Multiple de minimis effects could still accumulate to the point where site conservation objectives would be undermined. With a number of OWFs either going through examination or expected to submit

applications, it is important that project-specific contributions are fully assessed.

- 6.6.91. The Applicant [REP15-003] did not agree that it had been established that effects had already reached a level where AEoI could not be excluded or that the in-combination totals could prevent the delivery of the SPA conservation objectives. It stated that there was a significant element of precaution built into the assessments which results in an overly precautionary assessment.
- 6.6.92. NE maintained [REP14-064] that a range of site and specific factors need to be considered when making judgements about integrity. The counterfactual of growth and population size at the end of 30 years should be considered against a realistic assessment of current and future population trend. Where a site has a conservation objective requiring the restoration of a feature population, any additional impact could make the attainment of favourable conservation status not just slower but more difficult. It could make the population more vulnerable to events such as bad winters affecting survival or poor food availability affecting breeding success.
- 6.6.93. NE cited a Court of Justice of the European Union judgement (linked cases C-293/17 and C-294/17) which states that where the conservation status of a habitat is poor, the capacity to grant consents for further damaging activities is limited. LBBG have a wide foraging range which makes the species vulnerable to in-combination effects from a number of OWFs in the southern North Sea. An accumulation of minor effects could lead to "*death by a thousand cuts*" for the SPA feature.
- 6.6.94. The RSPB shared NE's position on the cumulative effects of OWF. At D15 it calculated the revised counterfactual of population size to show a reduction of 24.5% in the population after 30 years, compared with the population in the absence of collision related mortality [REP15-013].

ExA's conclusions on Alde-Ore Estuary SPA and Ramsar site

- 6.6.95. The ExA notes that despite their different approaches to the analysis of the evidence, the Applicant, NE and the RSPB have all been able to support a conclusion of no AEoI of the SPA/Ramsar site from the Proposed Development alone. The ExA is satisfied that adverse effects from the Proposed Development alone can be excluded.
- 6.6.96. In relation to in-combination effects, the ExA notes that the conservation objectives for the SPA require restoration of the population to that at the time it was designated. Any increase in the impacts on the population are likely to prevent or delay the achievement of the conservation objectives. The Applicant's position, supported by the SoS Habitats Regulations Assessment for Norfolk Vanguard OWF, is that the contribution to collision related mortality by the Proposed Development is so small as to be de minimis.
- 6.6.97. Notwithstanding the SoS position on Norfolk Vanguard OWF, the ExA remains concerned that the Habitats Regulations do not include any

reference to the exclusion of small scale effects or to treating effects as de minimis. The relevant test in Regulation 63 of the Habitats Regulations is whether there would be effects alone or in combination with other plans or projects. This implies that however small an effect is, it may still contribute to an adverse effect on integrity.

- 6.6.98. As described above, several different potential outcomes for the SPA population have been presented to the ExA. As noted in the previous section, the ExA is of the view that a precautionary approach should be taken to the assessment. The ExA acknowledges that the Applicant may be correct and the Proposed Development would not contribute significantly to any delay in achieving the restoration of the population. However, the analyses by NE and the RSPB demonstrate that the risk cannot be excluded. The ExA is not satisfied that it has the objective information before it which allows the exclusion of AEoI of the SPA/Ramsar site. The ExA therefore concludes that AEoI of the Proposed Development in combination with other OWFs cannot be excluded.

Flamborough and Filey Coast SPA

- 6.6.99. As noted in the previous sections of this report, in response to the concerns raised by NE, the Applicant provided updated CRM and displacement modelling [RE2P-035]. It also presented the PVA outputs to show both density dependent and density independent results.

Kittiwake (breeding) – collision related mortality

- 6.6.100. The Applicant's approach to CRM for this species was disputed by NE and the RSPB. The key areas of dispute are summarised below.

Population size at the time of designation

- 6.6.101. In the Applicant's view [REP2-035] and [REP8-016] there is credible evidence that the population counts at the time of designation were incorrect and confused the number of pairs with the number of individuals present. The target population for the conservation objective is 83,700 pairs. In the Applicant's view the target is erroneous and should be 44,520 pairs. NE refuted this argument [REP4-040] and [REP7-045].

Kittiwake flight speeds

- 6.6.102. The Applicant [REP2-035] noted that recent studies have reported slower flight speeds for kittiwake which would reduce the predicted number of collisions. The RSPB [AS-041] advised that the speeds suggested by the Applicant should not be used in isolation as they resulted from a single study on a single OWF distant from kittiwake breeding colonies.
- 6.6.103. The Applicant submitted a review of flight speed data [REP5-060] and considered it appropriate to reduce flight speed to 10.8m/s which would reduce collisions by 11%. The Applicant considered that it would be appropriate to apply this to all OWFs in the in-combination assessment.

- 6.6.104. NE [REP4-039] and [REP7-051] recognised the need to review the evidence base for flight speeds. However, it noted that the evidence presented by the Applicant in [REP5-060] had not been peer reviewed and that as there is uncertainty in the appropriate flight speeds to use, the currently used value from the literature (i.e. 13.1m/s) and the value from the work undertaken by the Applicant's consultants in [REP5-060] were used in the CRM, subject to some minor caveats it described in [REP7-051].
- 6.6.105. The Applicant [REP8-027] provided figures showing the effect of reducing the flight speed parameters on the number of collisions predicted per annum:

Flight speed (m/s)	NE preferred method	Applicant's preferred method
13.1	14	6.1
11.3	12.7	5.5
10.8	12.4	5.4

- 6.6.106. In the Applicant's view [REP9-010], the evidence in [REP5-060] supported the position that the speed recommended by NE was likely to be an overestimate. It did not consider that it was necessary to submit further CRM. It noted that using the slower speeds drawn from its review would lead to a reduction in estimates of around 10% both for the Proposed Development and for the OWFs which have used the 13.1 m/s speed. NE advised [REP9-049] that the presentation of the range of flight speeds did not alter its position in relation to collision impacts on the kittiwake feature either alone or in combination with other OWFs.
- 6.6.107. The RSPB [REP9-052] disputed the evidence provided by the Applicant, stating that the Applicant had dismissed studies using tagging on the grounds that the use of tags affected bird behaviour because of their weight. The RSPB also disputed the Applicant's interpretation of the evidence. It felt [REP9-052] and [REP15-013] that if site specific evidence could not be obtained which accounted for bird behaviour at a particular site, a precautionary value should be used for flight speed. It did not agree that there was sufficient evidence to support a change from the flight speed recommended by NE.

Kittiwake breeding season apportionment to the SPA

- 6.6.108. The Applicant's assessment [APP-201] estimated that 26.1% of the kittiwake observed on the OWF during the breeding season were potentially from the SPA. However, NE [RR-099] advised a range of apportionment rates (up to 100%) for the breeding season be considered in the assessment and recommended using a precautionary rate of 86% [REP4-039]. It noted that although tracking data up until 2015 suggests

low connectivity of the Proposed Development site with foraging birds from the colony, further tagging of kittiwakes from the SPA colony undertaken in 2017 indicates that birds from the SPA do forage within the Proposed Development site. The RSPB [RR-054], [REP2-096] and [REP3-028] also advised an apportionment of 86% to take into account kittiwake tracking data from 2017.

- 6.6.109. The Applicant [REP1-042] stated that presumption of up to 100% kittiwakes are breeding adults from the SPA is based on a limited dataset. It highlighted concerns with the kittiwake tracking data referred to by the RSPB and NE and considered the 26.1% estimate used in its assessment to be appropriate [REP2-021], [REP3-007] and [REP9-057].
- 6.6.110. Following the changes to the design of the Proposed Development, the Applicant provided revised collision figures for the Proposed Development alone [REP5-059] and in combination with other OWFs [REP8-025] and [REP8-026]. The Applicant estimated the annual collision related mortality at the Proposed Development site to be 57.5 (24.4 to 100.5 95% CI) for the 14.7MW turbine design with a 30m draught height. The numbers apportioned to the Proposed Development were:

	Spring	Breeding	Autumn	Annual
Applicant's preferred figures (apportionment rate of 26%)	0.9 (0.3 – 1.5 95% CI)	3.5 (0.9 – 7.2 95% CI)	1.7.(0.9 – 2.8 95% CI)	6.1 (2.1 – 11.5 95% CI)
NE's preferred figures (apportionment rate of 86%)	0.9 (0.3 – 1.5 95% CI)	11.4 (3 – 23.6 95% CI)	1.7.(0.9 – 2.8 95% CI)	14 (4.2 – 27.9 95% CI)

- 6.6.111. Before the changes to the design of the Proposed Development, the annual collision figures were 21.4 (using the Applicant's preferred method) and 49.5 (using NE's preferred method) [REP2-035] and [REP5-059]
- 6.6.112. The Applicant [REP2-035] stated that the SPA population at designation was 44,250 pairs. It calculated that the background mortality for this population, calculated using the adult mortality rate of 0.146, is 13,000. To lead to an increase in mortality of greater than 1%, this would require an additional mortality of 130 birds per year. The Applicant concluded that even if 100% of the birds present on the Proposed Development array came from the SPA, there would be no detectable increase in mortality.

- 6.6.113. NE [EV9-003] and [REP7-048] advised that the D5 collision figures represent 0.11% of baseline mortality of the kittiwake colony at the time of designation and 0.09% of the colony population size based on the mean of the 2016 and 2017 counts. It agreed that, at its preferred apportionment rate, the predicted mortality from the Proposed Development alone would not lead to AEoI of the SAC.
- 6.6.114. In relation to in-combination effects, the Applicant's D8 submissions [REP8-025] and [REP8-026] stated that the total combined annual collisions would be 699.4. It would be reduced to 362.5 in the absence of Hornsea Project Three OWF and Hornsea Project Four OWF.
- 6.6.115. In [REP2-035], the calculated total number of annual collisions using the Applicant's preferred approach was 669, dropping to 330.5 if both the Hornsea OWFs are excluded. This would equate to an increase in background mortality of 5.1% to 2.5% (assuming that the SPA population was 44,250 pairs at the time of designation). If NE's preferred apportionment rate is used this would be 782 and 389.2 collisions respectively.
- 6.6.116. The Applicant calculated that, using the counterfactual of population growth rate, if adult mortality was 750 birds, the reduction in the population growth rate would be 0.8% for a density independent model and 0.2% for a density dependent model. In the Applicant's view the SPA population has remained steady at an average of approximately 40,000 pairs. Based on the RSPB's figures for the SPA colony, the population has grown by 7% since 2000 [REP2-035].
- 6.6.117. The Applicant concluded that when allowance is made for the over-precaution in the assessment (e.g. consented designs compared with as-built, over-estimated nocturnal activity rates and density independent model predictions) the predicted impacts on the population are very small (no more than a 0.1% reduction in the population growth rate). Based on the recent trend in the population, and what the Applicant considered to be erroneous conservation objective targets, the Applicant considered that the number of in-combination collisions attributed to the Proposed Development is not at a level which would trigger a risk of population decline. There would be no adverse effect on the integrity of the SPA from the Proposed Development in combination with other OWFs.
- 6.6.118. NE [REP4-040] stated there is no clear evidence to support the application of any particular form or magnitude of density dependence in the modelling; therefore, it based its advice on the outputs of the density independent PVA model. The conservation objective for the kittiwake population of the Flamborough and Filey Coast SPA is to restore the size of the breeding population at a level which is above 83,700 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. It stated that the SPA colony growth rate is less than 1% per annum.

- 6.6.119. NE [REP4-040] advised that, based on [REP2-035], if the population growth rate is reduced by 0.8%, this would mean that the population would be 20.5 to 21.8% lower than the current population size. In the context of a population trajectory that is currently stable or increasing at less than 1% per annum, an additional mortality of 350 to 400 adults per annum (excluding the effects of the Hornsea Project Three OWF and Hornsea Project Four OWF) or of 700 to 750 (including Hornsea Projects Three and Four OWFs) over 30 years, would cause the population to decline. The relevant conservation objective is for the population at designation to be restored [REP9-049].
- 6.6.120. NE further advised [REP7-050] that with regard to the Hornsea Project Three OWF further design mitigations, whilst any amendments to the Hornsea Project Three OWF design envelope (i.e. lower tip height and reduction in turbine numbers) would result in a proportional reduction in the collision estimates, NE would most likely be unable to agree on what the absolute level of reduction would be as the issues with the underlying baseline data have not been resolved.
- 6.6.121. NE stated [REP9-042], [REP14-065] and [REP14-066] that they had already advised at the Hornsea Project Two and East Anglia THREE OWF examinations that it was not possible to exclude an AEoI on the kittiwake feature of the SPA from in-combination collisions both including and excluding the contribution from Hornsea Project Three and Hornsea Project Four [REP9-049] and [REP13-038].
- 6.6.122. The Applicant submitted the SoCG between NE and the East Anglia THREE OWF [REP8-017] showing that NE had previously agreed that the contributions for this OWF, while they did contribute to the in-combination total number of collisions, were so small as to not materially affect the significance or likelihood of an adverse effect on the integrity of the SPA. The total number of in-combination collisions identified for this OWF was 319, while the contribution for East Anglia THREE OWF was 7.8 birds [REP8-027].
- 6.6.123. The RSPB [AS-041] stated the Applicant predicts up to a 21.7% reduction in the kittiwake population of the Flamborough and Filey Coast SPA as a result of in-combination collision impacts, in comparison with the unimpacted population, during the lifetime of the Proposed Development. It therefore could not rule out an AEoI of the SPA. Based on the Applicant's collision figures provided at D5 and D6, the RSPB calculated that if the counterfactual of population size is used, after 30 years the in-combination mortality would lead to the kittiwake population being 20.5% lower than it would have been in the absence of those effects [REP9-052].
- 6.6.124. The Applicant noted [REP13-013] that the SoS decision in relation to the Norfolk Vanguard OWF concluded that the potential loss of a small number of birds would not contribute in a significant way to the total loss and therefore could be treated as a de minimis effect. The magnitude of effects for the Proposed Development and those predicted for Norfolk Vanguard OWF are similar; the array area for the Proposed Development

is further from the SPA than the array area for Norfolk Vanguard OWF so the degree of connectivity with the SPA is expected to be lower. The SoS was not able to rule out an adverse effect from in-combination effects for the Hornsea Project Three OWF [REP13-031].

- 6.6.125. NE [REP13-038] and the RSPB [REP13-049] advised that the SoS decision on the Norfolk Vanguard OWF did not affect their position in relation to in-combination effects on the SPA kittiwake population. NE did advise however that as the Thanet Extension OWF had not been consented, it would be possible to remove the contribution from that project to the in-combination total of collisions. It remained uncertain as the appropriate in-combination contribution from Hornsea Projects Three and Four OWFs but expected the in-combination collision total to increase [REP13-038].
- 6.6.126. NE stated [REP13-038], [REP14-064] and [REP14-066] that as kittiwake have a wide foraging range, birds from the colony are likely to interact with a substantial proportion of the OWFs in the southern North Sea. The percentage contribution to collisions from each OWF may be minor but has already reached a point where adverse effects could arise and will only continue to increase as further OWFs are consented. In addition, as more OWFs are consented, the percentage contribution for individual OWFs is likely to decrease, making individual contributions appear less significant. The RSPB [REP14-066] supported NE's position.
- 6.6.127. During the Examination, Hornsea Project Three OWF submitted revised design parameters and associated figures for kittiwake collision numbers. NE advised [REP14-064] that, based on the revised central predicted figure for Hornsea Project Three OWF, the predicted collision numbers would be 73. The revised in-combination totals, including Hornsea Project Three OWF but excluding the figures from Thanet Extension and Hornsea Project Four OWFs, would be 434 birds.
- 6.6.128. Based on the Applicant's PVA output, for an additional mortality of 450 adults per year, the population growth rate would be reduced by 0.5%. If the population is stable then after 30 years the population would be 13.7% lower than in the absence of collision-related mortality from OWF. The population would therefore decline below current levels and the conservation objective to restore the population would not be met [REP13-038]. NE considered [REP14-066] that the Proposed Development does make a meaningful contribution (3.9% based on the central estimate).
- 6.6.129. The RSPB considered [REP15-013] that the SoS's decision did not consider the reality of accumulating in-combination effects and how they affect the integrity of SPAs. It broadly agreed with NE's position on the accumulation of effects on SPA populations. It presented figures showing the trend in fledged chicks per pair between 2009 and 2020 for the Flamborough colony. It stated that evidence presented by the JNCC showed that within the UK population, adult survival and productivity are declining, probably as a result of declines in prey species and increases in sea temperature. The RSPB is concerned that the effects of collision

related mortality from OWFs could add another source of stress and reduce the chances of the population recovering.

- 6.6.130. At D15 [REP15-013], the RSPB stated it agreed with NE's choice of parameters. However, it also calculated that the revised in-combination calculation of the counterfactual of population size, based on the Applicant's preferred parameters, showed a reduction in the population size of 9.6%. It highlighted several areas where it considered the Applicant had not used the appropriate parameters in its PVA. These were the most recent population size from 2017 (51, 535 pairs), the colony productivity for the last 5 years (0.55 – 0.7 chicks per pair) and inclusion of a non-breeding rate to account for the proportion of adult birds which do not breed.
- 6.6.131. The Applicant [REP15-003] did not agree that in-combination effects on the kittiwake population had reached a level that the integrity of the SPA was already affected. It argued that NE had failed to take account of the over-precaution in the assessment due to headroom and the evidence suggesting that the population at designation was 44,520 pairs, not 83,700. The current population is 51,000 pairs so if a reduction of 13.7% occurred, it would mean that the population would be around 44,000 and therefore close to the designation population at the end of 30 years.

ExA conclusions

- 6.6.132. The Applicant, NE and the RSPB, despite the differences in their assessment of effects have all been able to conclude that the collision related mortality on kittiwake from the Proposed Development alone would not lead to AEoI of the SPA. The ExA is content to agree with this conclusion.
- 6.6.133. There was less consensus on the effects on the kittiwake population due to in-combination collision related mortality. One major area of dispute was the size of the population at the time that the SPA was designated. The ExA notes that the Applicant considers that there is evidence that the population was approximately half the size of the official designation population. However, on the basis of the evidence presented during the Examination, the ExA is not satisfied that there is sufficient reason to dispute the conservation objective target. Accordingly, the ExA has considered the effects on the population in the light of the need to restore the population to 83,700 pairs.
- 6.6.134. In relation to kittiwake flight speed, the ExA is of the view that flight speeds are likely to vary in response to site-specific conditions. In the absence of a consensus on the appropriate range of speeds to be used in CRM, the ExA agrees that the flight speed advised by NE (11.1 m/s) should be relied on. In relation to apportionment of breeding season effects, the ExA feels that it is appropriate to consider the effects from both NE and the Applicant's preferred rates.
- 6.6.135. As noted in the previous sections, the ExA is of the view that a precautionary approach should be taken to the assessment. The ExA agrees that density dependent effects are likely to be operating in the

SPA colony but is not convinced that there is sufficient evidence to incorporate those effects into the modelling. It feels therefore that more reliance should be placed on density independent population modelling.

- 6.6.136. The ExA has had a range of analyses and potential outcomes put before it during the Examination. However, all the analyses presented indicate some reduction in population growth rates. The question is, to what extent would those decreases in population growth rate interfere with the aim of restoring the SPA population? Based on NE's advice, it appears that there is a risk that the population would decline or at best remain stable.
- 6.6.137. The ExA acknowledges that collision related mortality from OWF is probably not a major contributor to the decline in the SPA population and also notes that it is showing some signs of growth. However, the risk is that any additional contributions to adult or chick survival could affect the potential to achieve the conservation objectives.
- 6.6.138. The contribution from the Proposed Development to the in-combination collision total is likely to be fairly small. The ExA acknowledges that the SoS decision on Norfolk Vanguard OWF was that this scale of effects can be treated as de minimis (and that in the past NE has been content to agree with this position). The ExA remains concerned that the Habitats Regulations do not include any reference to the exclusion of small scale effects or to treating effects as de minimis. The relevant test is in Regulation 63 of the Habitats Regulations is whether there would be effects from alone or in combination with other plans or projects. This implies that however small an effect is, it may still contribute to an AEoI. It follows therefore that an accumulation of de minimis effects could lead to AEoI. The ExA therefore concludes that AEoI from in-combination collision mortality on kittiwake cannot be excluded.

Gannet – collision related mortality

- 6.6.139. Following the changes to the design of the Proposed Development, the Applicant provided revised collision figures for the Proposed Development alone [REP5-059] and in combination with other OWF [REP8-025] and [REP8-026].
- 6.6.140. Following the revisions to the design envelope of the Proposed Development, the Applicant [REP5-059] estimated collision mortality of gannet at the Proposed Development site as 30.7 birds per year (95% CIs 8.5 – 62.6). Apportioning to the SPA gives an annual mortality of 15.1 individuals (95% CIs 1.1 – 36.3) from a population of approximately 22,122 birds (the SPA population at the time of designation). At an adult natural mortality rate of 0.081, the baseline mortality is approximately 1,792. An addition of 15.1 to this increases the mortality rate by 0.8%, which is below the 1% threshold of detectability. The most recent count for the colony is 26,782 birds.
- 6.6.141. NE [EV9-003] and [REP7-048] agreed with the Applicant's conclusion that there would be no AEoI of the SPA as a result of collisions from the Proposed Development alone. However, the RSPB [REP2-069], [AS-041]

and [REP6-038] did not agree with this conclusion. It stated that if its preferred avoidance rate of 98% was applied then based on the Applicant's assessment in [APP-201], the SPA population would decline by up to 18%. At D15 however it stated that its position was that it agreed that AEoI of the feature could be excluded for the Proposed Development alone.

- 6.6.142. In relation to in-combination collision related mortality, the Applicant's assessment [REP8-025] and [REP8-026] was that the annual in-combination collision numbers would be 359. If Hornsea Project Three OWF is excluded the number is 331, without Hornsea Project Four OWF it is 314 and if both projects are excluded then the number is 287.
- 6.6.143. The Applicant's density independent population modelling for higher levels of 325 and 400 [REP2-035] based on the counterfactual of population growth found that these levels of mortality would reduce the median population growth rate by a maximum of 1.8%, The actual annual growth rate of this population over the last 25 years has been 10%.
- 6.6.144. The Applicant concluded that this level of in-combination mortality represents a negligible risk to this population; the number of predicted in-combination gannet collisions attributed to the SPA is not at a level which would trigger a risk of population decline, and in fact population modelling indicates that the in-combination mortality predicted would not halt but only slow the population increase currently seen at this colony. The Applicant concluded that there would be no AEoI of the SPA from in-combination collision related mortality on gannet, even with what it considered to be a highly precautionary assessment [REP2-035].
- 6.6.145. NE [REP4-040] stated there is no clear evidence to support the application of any particular form or magnitude of density dependence in the modelling so its advice was based on the outputs of the density independent PVA model. It [REP4-040] advised that based on [REP2-035], assuming exclusion of Hornsea Projects Three and Four OWFs, the population of the SPA after 30 years would be 34.9 to 37% lower than it would have been in the absence of the additional mortality and the population growth rate would be reduced by 1.5 to 1.6%.
- 6.6.146. The colony would be predicted to reduce from its current size of 24,594 adults with a growth rate of 1% but would still be above the conservation objective population size of 8,469 pairs or 16,938 adults. The colony would be predicted to continue to grow above the current mean population of 24,594 adults under any growth rate scenario from 2% to 5% per annum. NE agreed that AEoI can be ruled out if the contributions from Hornsea Projects Three and Four OWFs are excluded but not if these two OWFs are included [REP4-040]. NE acknowledged [REP7-047] that the changes to the design envelope for the Proposed Development had lowered the number of collisions from those reported in [REP22-035] but confirmed that its position remained unchanged.

- 6.6.147. The RSPB [AS-041] initially noted the Applicant's modelling predicted up to a 41.1% reduction in the gannet population of the SPA as a result of in-combination collision impacts when compared with the unimpacted population, during the lifetime of the OWF (based on the Applicant's calculations in [REP2-035] but using the counterfactual of population size). At D15, presumably in response to the decrease in collision numbers resulting from the changes to the design envelope of the Proposed Development, the RSPB revised these figures to conclude that there would be a reduction in the population of 37% (or 30% if Hornsea Projects Three and Four OWFs are excluded) [REP15-013]. While the RSPB agrees that the gannet population is robust [REP10-068] the scale of impacts predicted for the population means that AEoI of the SPA cannot therefore be excluded regardless of whether the Hornsea projects are included or not [REP9-052] and [REP10-068].

Gannet – displacement

- 6.6.148. The Applicant estimated mortality of gannet at the Proposed Development apportioned to the SPA population as 10.8 (95% CIs of 0.5 - 17) for 80% displacement and 1% mortality and as 8.1 (95% CIs 0.7 - 23) for 60% displacement and 1% mortality. This would increase the background mortality by a maximum of 1.3%, with the more precautionary combination of parameters (80% displacement, 1% mortality and upper 95% CI) [REP2-035].
- 6.6.149. The Applicant's density independent population modelling found that this level of mortality would reduce the median population growth rate by a maximum of 0.01%, which compares with the actual annual growth rate of this population over the last 25 years of 10% [REP2-035].
- 6.6.150. The Applicant concluded that this level of mortality represents a negligible risk to this population and that there would be no AEoI of the SPA as a result of gannet displacement from the Proposed Development alone [REP2-035]. NE [REP4-040] agreed with this conclusion.
- 6.6.151. The Applicant's in-combination displacement mortality of gannets apportioned to the SPA population was estimated at between 61 (60% displacement and 1% mortality) and 82 (80% displacement and 1% mortality) when Hornsea Projects Three and Four OWFs are included and between 41 and 55 with these projects omitted [REP2-035]. This would increase the background mortality by a maximum of between 2.3% and 3.1% (without Hornsea Projects Three and Four) and between 3.4% and 4.6% (including Hornsea Projects Three and Four) [REP2-035].
- 6.6.152. The Applicant's density independent population modelling, based on the counterfactual of population growth found that these levels of mortality would reduce the median population growth rate by a maximum of 0.03%, compared with the actual annual growth rate of this population over the last 25 years of 10% [REP2-035].
- 6.6.153. The Applicant concluded that this level of in-combination mortality represents a negligible risk to this population and that even with what it considered to be a highly precautionary assessment, there would be no

AEoI of the SPA as a result of displacement of gannet from the Proposed Development area in-combination with other plans and projects [REP2-035].

- 6.6.154. Based on the Applicant's calculations in [REP2-035], NE [REP4-040] advised that excluding Hornsea Projects Three and Four OWFs, the population of the SPA after 30 years would be 6.4 to 9.4% lower than it would have been in the absence of the additional mortality and the population growth rate would be reduced by 0.2 to 0.3%. The colony would still be predicted to grow above the current mean population of 24,594 adults under any growth rate scenario from 1% to 5%; this would allow the conservation objective to be met. NE therefore agreed AEoI can be ruled out if Hornsea Projects Three and Four OWFs are excluded from the in-combination totals.
- 6.6.155. NE was unable to advise no AEoI of the SPA if Hornsea Projects Three and Four OWFs are included in the in-combination totals. This was due to NE's concerns regarding the incomplete baseline surveys for Hornsea Project Three OWF, and the associated level of uncertainty regarding the potential impacts of that project, together with the inevitable uncertainty associated with the effects for Hornsea Project Four OWF from the PEIR [REP4-040].

Gannet – combined displacement and collision mortality

- 6.6.156. The Applicant [APP-201] considered the in-combination effects of both collision and displacement to gannet. NE [RR-099] advised that this should be summed for the project alone. The Applicant considered collision risk and displacement to be two mutually exclusive events and that this approach leads to potential double counting [REP1-042].
- 6.6.157. NE [REP4-040] explained that the number of birds at risk of reduced individual fitness (i.e. mortality and productivity losses) as a result of displacement is based on the numbers of birds present within a development area and buffer both on the water and in flight. Assessment of the number of birds at risk of mortality as a result of collisions (e.g. with wind turbines) is based on the number of birds present within a development area that are in flight only.
- 6.6.158. The mortality impacts estimated from CRM are assumed to be in addition to any mortality caused by displacement impacts (because the collision estimates take account of birds that avoid the OWF). Productivity impacts due to displacement would be a further addition (but this is not currently quantitatively accounted for under existing methods/advice). It regarded the two impacts (collision and displacement) as additive and advised that they should be summed. NE acknowledged that this simplistic approach will incorporate a degree of precaution, the level of which is difficult to gauge [REP4-040].
- 6.6.159. The Applicant calculated a combined annual gannet displacement and collision mortality for the Proposed Development alone for the SPA population of up to 26 (8.1-10.8 from displacement [REP2-035] plus 15.1

from collisions) [REP5-059]. This would increase the background mortality rate by 1.4%.

- 6.6.160. The Applicant's density-independent population modelling found that a mortality of 75 (i.e. three times higher) would reduce the median population growth rate by a maximum of 0.3%, compared against the actual annual growth rate of this population over the last 25 years of 10% [REP6-007].
- 6.6.161. The Applicant concluded that this level of mortality represents a negligible risk to the population; the number of predicted project alone gannet collisions and displacement mortalities attributed to the SPA is not at a level which would trigger a risk of population decline, and population modelling indicates that the predicted mortality would only slow, rather than halt, the population increase currently seen at this colony. Therefore, the Applicant concluded that there would be no AEoI of the SPA from impacts on gannet from combined displacement and collision risk from the Proposed Development alone [REP2-035]. NE [EV9-003] and [REP7-048] agreed with this conclusion.
- 6.6.162. In relation to the in-combination mortality estimates for the combined displacement and collision related mortality, the Applicant estimated an annual figure of and collision mortality for all OWFs with potential connectivity to the SPA as 343 to 441 (displacement of 41-55 without Hornsea Projects Three and Four OWFs and 61-82 with Hornsea Projects Three and Four OWFs [REP2-035]; and collisions of 288 without Hornsea Projects Three and Four OWFs and 359 with Hornsea Projects Three and Four OWFs [REP6-007]. These would increase the background mortality rate by more than 1%.
- 6.6.163. The Applicant's density independent population modelling [REP2-035] found that the median population growth rate would be reduced by a maximum of 2.3% using density independent modelling combined and the counterfactual of population growth rate. This compares with the actual annual growth rate of this population over the last 25 years of 10% [REP2-035].
- 6.6.164. The Applicant concluded that this level of in-combination mortality represents a negligible risk to this population's status; the number of predicted in-combination gannet collisions and displacement mortalities attributed to the SPA is not at a level which would trigger a risk of population decline, and population modelling indicates that the in-combination mortality predicted would only slow, rather than halt the population increase currently seen at this colony. The Applicant concluded that there would be no AEoI of the SPA from combined displacement and collision mortality for the Proposed Development in combination with other OWFs [REP2-035].
- 6.6.165. Based on the Applicant's figures in [REP2-035], NE [REP4-040] advised that, assuming exclusion of Hornsea Projects Three and Four OWFs, the population of the SPA after 30 years would be 39.1 to 41.1% lower than it would have been in the absence of the additional combined mortality.

The population growth rate would be reduced by 1.7 to 1.8%. It concluded the following:

- a. With a growth rate of 1% the colony would be predicted to reduce from its current size of 24,594 adults but would still be above the size of the 8,469 pairs or 16,938 adults.
- b. Under any growth rate scenario from 2% to 5% per annum the colony would be predicted to continue to grow above the current mean population of 24,594 adults.

- 6.6.166. NE [REP4-040] explained that the conservation objective for the gannet population of the SPA is to maintain the size of the breeding population at a level which is above 8,469 pairs (16,938 adults), whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. The latest mean count is 24,594 adults based on the mean of the 2012, 2015 and 2017 counts.
- 6.6.167. It considered a range of plausible future growth rate scenarios of 1%, 2%, 3%, 4% and 5% per annum, but advised that the annual growth rate is unlikely to be as low as 1%. NE advised [REP9-042] and [REP9-057] that if the colony were to experience an annual growth rate of 2% or more per annum over the next 30 or so years, then the integrity of the site for this feature is high, with high rates for self-repair, and self-renewal under dynamic conditions with minimal external management. The SPA gannet population is believed to be robust enough to allow the conservation objective to maintain the population at (or above) designation levels and sustain additional alone and in-combination mortalities from the offshore OWFs if Hornsea Projects Three and Four OWFs are excluded from the in-combination totals.
- 6.6.168. In NE's view the uncertainty about the impacts of Hornsea Projects Three and Four OWFs discussed previously in this report precluded it advising that AEoI could be excluded if these two OWFs were included in the assessment of in-combination effects [REP4-040], [REP9-049] and [REP9-057].
- 6.6.169. At D8 the Applicant submitted a copy of NE's SoCG [REP8-017] with the East Anglia THREE OWF. NE had agreed with that although in-combination effects on gannet could not be ruled out, NE were satisfied following changes to the design of the OWF that AEoI of the SPA could be excluded.
- 6.6.170. The RSPB [REP15-013] advised that its concerns about AEoI of the gannet feature from collision-related mortality were exacerbated by the effects of displacement.

SoS decision on Norfolk Vanguard OWF

- 6.6.171. The Applicant [REP13-013] noted that the SoS's appropriate assessment for the Norfolk Vanguard OWF concluded that the use of the Hornsea Project Three OWF data in an in-combination assessment is appropriate. The SoS concluded that AEoI of the feature could be excluded both alone or in-combination with other plans and projects, including Hornsea

Projects Three and Four OWFs [REP17-003]. It also concluded that since the contribution from Norfolk Vanguard OWF is of a similar scale to that from the Proposed Development, the SoS conclusions for the Proposed Development are likely to be the same as those for Norfolk Vanguard [REP13-013] and [REP17-003].

- 6.6.172. NE [REP13-038] and the RSPB [REP13-049] confirmed that the SoS decision on Norfolk Vanguard and the "*mindful to approve*" letter for Hornsea Project Three OWF did not change their position. At D14 NE advised [REP14-064] that the Hornsea Project Three OWF had only provided updated figures for the collision mortality for kittiwake so it was unable to advise what effect the proposed mitigation measures for the project would have on gannet mortality. It could not exclude AEOI of the gannet population from the in-combination effects of displacement and collision related mortality if effects Hornsea Projects Three and Four OWFs were included in the assessment.
- 6.6.173. The RSPB stated [REP18-003] that the SoS decision did not present the evidence supporting their decision on gannet so it did not know on what basis the decision was made.

ExA's conclusions

- 6.6.174. The Applicant, NE and the RSPB, despite the differences in their assessment of effects have all been able to conclude that collision and displacement mortality, separately or combined, would not lead to AEOI of the SPA from the Proposed Development alone. The ExA is content to agree with this conclusion.
- 6.6.175. In relation to in-combination effects, the ExA has considered the range of estimates of the decrease in population size presented during the Examination. While noting the RSPB's concerns about the appropriate avoidance rate the ExA is satisfied that the avoidance rate advised by NE (98.9%) can be relied on.
- 6.6.176. In relation to the inclusion of the data from Hornsea Project Three OWF, the ExA is mindful that the SoS is satisfied that the Hornsea Project Three OWF baseline data for gannet can be relied on. The ExA notes that the data for Hornsea Project Four OWF has been drawn from the project PEIR so there is a degree of uncertainty attached to it. Nonetheless it appears to be the only data for this project which is currently available to the Applicant. The ExA does not agree with NE's position that it is not possible to reach a conclusion on in-combination effects on the gannet population unless these two projects are excluded.
- 6.6.177. In the absence of advice from NE which addresses the in-combination effects of all the OWF, the ExA has considered the estimates on decreases in population growth presented by the Applicant and the RSPB. The ExA has assumed that the additive effects of collision and displacement related mortality represents the greatest effect on the population.

6.6.178. Even if the RSPB's estimates of the reduction in the population size over 30 years is used, based on the 98.9% avoidance rate, the population would decrease by 37.1% compared with the population in the absence of in-combination mortality (the RSPB did not provide figures on displacement effects). Based on NE's advice on population growth, this appears to be a figure that the population could sustain without dropping below the conservation objective target population of 8,469 pairs or 16,938 adults.

6.6.179. The ExA is satisfied that AEoI from in-combination collision and displacement related mortality effects on the gannet population can be excluded.

Razorbill – displacement effects

6.6.180. As noted in previous sections of this report, the Applicant, NE and the RSPB did not agree on the rates of displacement or the likely level of mortality associated with displacement for the auk species (razorbill and guillemot). The Applicant's D2 assessments presented a range of figures for both the numbers of birds displaced and the associated mortality.

6.6.181. For displacement effects during operation the Applicant's D2 assessment [REP2-035] estimated annual displacement mortality of razorbills apportioned to the SPA as between:

- a. 0.1 (0 to 0.2 95% CIs) for 30% displacement and 1% mortality;
- b. 3.5 (1.0 to 5.7 95% CIs) for 70% displacement and 10% mortality and 95% CIs 1.0-5.7); and
- c. the Applicant's preferred figure was 0.2 (0.1 to 0.4 95% CIs) for 50% displacement and 1% mortality.

6.6.182. The Applicant concluded that this would increase the background mortality from the Proposed Development by a maximum of 0.26% [REP2-035] which is less than the threshold for detectability (1%). It therefore concluded that there would be no AEoI of the SPA as a result of razorbill displacement from the Proposed Development alone [REP2-035]. NE agreed with this conclusion [REP2-080] and [REP4-040].

6.6.183. In relation to in-combination effects from operational displacement, the Applicant's D2 assessment [REP2-035] estimated in-combination displacement mortality of razorbills apportioned to the Flamborough and Filey Coast SPA population as between:

- a. 21 for 30% displacement and 1% mortality;
- b. 497 for 70% displacement and 10% mortality; and
- c. the Applicant's preferred figure was 35 for 50% displacement and 1% mortality.

6.6.184. This would increase the background mortality by a maximum of 18.9% [REP2-035]. The Applicant's density independent population modelling found that mortality up to 500 would reduce the median population growth rate by a maximum of 2.4%, compared against the actual annual growth rate of this population between 2000 and 2017 of 7.2%.

- 6.6.185. The Applicant concluded that this level of in-combination mortality represents a negligible risk to this population's status. The number of predicted in-combination razorbill displacement mortalities attributed to the SPA is not at a level which would trigger a risk of population decline. The Applicant concluded that there would be no AEoI of the SPA from displacement impacts on razorbill, even with what it considered to be a highly precautionary assessment [REP2-035].
- 6.6.186. NE [REP4-040] stated there is no clear evidence to support the application of any particular form or magnitude of density dependence in the modelling, therefore it based its advice on the outputs of the density independent PVA model. It explained that the conservation objective for the razorbill population of the SPA is to maintain the size of the breeding population at a level which is above 10,570 breeding pairs whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. It stated that colony productivity is higher than the national average and that the 2017 colony count indicated approximately 40,506 breeding adults across the site [REP4-040].
- 6.6.187. NE confirmed [REP4-040] that it did not anticipate razorbill mortality rates to be at the top of the range considered and it did not expect the mortality to exceed a level where the population growth rate would decline by more than approximately 0.5% per annum; this would approximate to the population being 13% lower after 30 years when compared to the unimpacted population (based on 100 birds annual adult mortality). Based on this, the current population trend and productivity levels for the colony, NE agreed an AEoI of the SPA can be ruled out from displacement in-combination with other plans and projects when Hornsea Projects Three and Four OWFs are excluded from the in-combination total [REP4-040] and [REP9-057].
- 6.6.188. As discussed in previous sections of this report, NE's concerns about the uncertainties associated with the baseline data for the Hornsea Projects Three and Four OWF prevented it from advising that AEoI can be excluded when these two projects are included in the in-combination total [REP4-040].
- 6.6.189. The Applicant [REP13-013] considered that NE's approach was over-precautionary and maintained its position that there would be no AEoI of the SPA. It noted that the SoS's HRA [REP13-023] for the Norfolk Vanguard OWF concluded that the inclusion of the Hornsea Project Three OWF data did not affect the conclusions of the in-combination assessment.
- 6.6.190. The RSPB [AS-041] and [REP15-013] noted the Applicant predicts up to a 50.1% reduction in the razorbill population of the SPA as a result of in-combination displacement impacts, in comparison with the unimpacted population, during the lifetime of the OWF (based on the Applicant's calculations in [REP2-035]). It therefore could not rule out an adverse effect on integrity if the effects from the Hornsea Projects Three and Four are included [AS-041], [REP10-068] and [REP15-013].

- 6.6.191. The Applicant [REP9-010] stated that the RSPB's position is based on the in-combination total based on the most precautionary displacement parameters (70% displacement and 10% mortality) and including Hornsea Projects Three and Four OWFs. NE has advised that a mortality rate of 10% is unlikely [REP9-010] and [REP12-001]. The RSPB agreed that although 10% mortality is unlikely, given the lack of evidence on mortality rates from displacement, it is still an entirely possible value [REP10-068].
- 6.6.192. At D14 NE advised [REP14-064] that the Hornsea Project Three OWF had only provided updated figures for the collision mortality for kittiwake so it was unable to advise what effect the proposed mitigation measures for the project would have on razorbill mortality. It could not exclude AEoI of the razorbill population from the in-combination effects of displacement. NE [REP14-064] and [REP14-065] and the RSPB advised [REP13-049] that their positions had not changed following the SoS decision on Norfolk Vanguard OWF.

ExA's conclusions on the Proposed Development alone

- 6.6.193. The Applicant, NE and the RSPB, despite their different approaches to the assessment of displacement effects, agreed that AEoI of the SPA from effects on the razorbill feature alone can be excluded. The ExA is content that AEoI of the SPA would not arise from the Proposed Development alone.
- 6.6.194. The ExA's conclusions on in-combination effects are discussed alongside its conclusions on in-combination effects for guillemot below.

Guillemot – displacement impacts

- 6.6.195. For displacement effects during operation, the Applicant's D2 assessment [REP2-035] estimated annual displacement mortality of guillemots at the Proposed Development apportioned to the SPA population as between:
- a. 1.8 (1.1. to 2.6 95% CI) for 30% displacement and 1% mortality;
 - b. 42.4 (25.1 to 60.5 95% CI) for 70% displacement and 10% mortality; and
 - c. Applicant's preferred figure was 3.0 (1.8 to 4.3 95% CI) for 50% displacement and 1%.
- 6.6.196. This would increase the background mortality by a maximum of 1.2% [REP2-035]. The Applicant's density independent population modelling found that a mortality of 100 would reduce the median population growth rate by a maximum of 0.1% compared against the actual annual growth rate of this population between 2000 and 2008 of 3% and between 2008 and 2017 of 4% [REP2-035].
- 6.6.197. The Applicant concluded that there would be no AEoI of the SPA as a result of guillemot displacement from the Proposed Development alone [REP2-035]. NE agreed with this conclusion [REP2-080] and [REP4-040].

- 6.6.198. In relation to in-combination displacement mortality during operation the Applicant's D2 assessment estimated mortality apportioned to the SPA as between:
- a. 130 for 30% displacement and 1% mortality;
 - b. 3,037 for 70% displacement and 10% mortality; and
 - c. the Applicant's preferred figure was 217 for 50% displacement and 1% mortality.
- 6.6.199. This would increase the background mortality by between 2.6% and 60%. The Applicant's density independent population modelling estimated that at a mortality of 3,050 the median population growth rate would be reduced by a maximum of 4.1% [REP2-035]. With the Hornsea Projects Three and Four OWFs omitted, the total in-combination mortality would be 1,697 (at 70% displacement and 10% mortality), which would reduce the population growth rate by 2.3%. These compare with the actual annual growth rate of this population between 2000 and 2008 of 3.0% and between 2008 and 2017 of 4.0% [REP2-035].
- 6.6.200. The Applicant concluded that the Proposed Development would make a small contribution to the in-combination effect and that although the most precautionary prediction would reduce the population growth rate, this would not trigger a risk of population decline. It considered that NE's methods and 10% mortality potentially over-estimates the impact by a factor of ten and it is very probable that the effect on the population would be considerably smaller and would not prevent future growth. The Applicant concluded that there would be no AEoI of the SPA as a result of the Proposed Development's contribution to in-combination effects.
- 6.6.201. NE [REP4-040] explained that the conservation objective for the guillemot population of the SPA is to maintain the size of the breeding population at a level which is above 41,607 breeding pairs whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. It stated that the 2017 colony count indicated approximately 121,754 breeding adults across the site.
- 6.6.202. NE confirmed [REP4-040] that it did not anticipate guillemot mortality rates to be at the top of the range considered and it did not expect the mortality to exceed a level where the population growth rate would decline by more than approximately 0.5% per annum. Based on this, the current population trend and productivity levels for the colony, NE agreed AEoI on the guillemot feature of the SPA could be ruled out from displacement in-combination with other plans and projects when Hornsea Projects Three and Four are excluded from the in-combination total [REP4-040] and REP9-057].
- 6.6.203. As discussed in previous sections of this report, NE's concerns about the uncertainties associated with the baseline data for the Hornsea Projects Three and Four OWFs prevented it from advising that AEoI can be excluded when these two projects are included in the in-combination total [REP4-040] and [REP9-057].

- 6.6.204. The Applicant [REP13-013] considered that NE's approach was overly precautionary and maintained its position that there would be no AEoI of the SPA. It noted that the SoS's appropriate assessment [REP13-023] for the Norfolk Vanguard OWF concluded that the inclusion of the Hornsea Project Three OWF data did not affect the conclusions of the in-combination assessment.
- 6.6.205. At D14 NE advised [REP14-064] that the Hornsea Project Three OWF had only provided updated figures for the collision mortality for kittiwake so it was unable to advise what effect the proposed mitigation measures for the project would have on gannet mortality. It could not exclude AEoI of the gannet population from the in-combination effects of displacement
- 6.6.206. The RSPB [AS-041] noted the Applicant predicts up to a 72.56% reduction in the guillemot population of the Flamborough and Filey Coast SPA as a result of in-combination displacement impacts, in comparison with the unimpacted population, during the lifetime of the OWF (based on the Applicant's calculations in [REP2-035]). It therefore could not rule out AEoI of the SPA from in-combination effects on the guillemot feature when the effects of Hornsea Projects Three and Four OWFs are included in the total [REP15-013]. It agreed that 10% mortality is unlikely but considers that given the lack of evidence on mortality rates from displacement, it is still an entirely possible value [REP10-068].
- 6.6.207. NE [REP14-064] and [REP14-065] and the RSPB [REP13-049] advised that their position had not changed following the SoS decision on Norfolk Vanguard.

ExA's conclusions

- 6.6.208. The Applicant, NE and the RSPB, despite their different approaches to the assessment of displacement effects, agreed that AEoI of the SPA from effects on the guillemot feature alone can be excluded. The ExA is content that AEoI of the SPA would not arise from the Proposed Development alone.
- 6.6.209. In relation to in-combination effects, NE and the RSPB did not agree that AEoI could be excluded if effects from Hornsea Projects Three and Four OWFs were included in the assessment. As explained in the ExA's conclusions on the gannet feature, the ExA notes the SoS decision that the figures from Hornsea Project Three OWF should be included in the in-combination assessment.
- 6.6.210. As discussed in previous sections of this report, the ExA considers that a precautionary approach should be taken to the assessments. It considers that as it does not appear possible to quantify the extent of density dependence operating in the colony, density independent modelling should be relied on. It does not appear that there is sufficient evidence available to reach a firm conclusion on appropriate displacement rates or displacement mortality rates. However, there appears to be a degree of consensus that the worst case scenario of 10% displacement mortality is unlikely for both species although not impossible.

- 6.6.211. In relation to razorbill, both the Applicant and NE agree that for 10% mortality and 70% displacement, the population growth rate would decrease by 2.4% per annum. On the basis of NE's calculations this would lead to a decrease in the population over 30 years (compared with the situation in the absence of the in-combination mortality), albeit a considerably smaller decrease than that calculated by the RSPB. NE advised that AEoI could be excluded if the annual growth rate declined by less than 0.5% per annum.
- 6.6.212. It appears possible that the reduction in the annual growth rate could be kept to 0.5% where displacement is 30 to 70% of the population and mortality is 2% or less. Notwithstanding the SoS decision on the Norfolk Vanguard OWF, the ExA remains concerned that it does not have the evidence to conclude that effects would remain within these ranges. The ExA therefore does not agree that AEoI of the razorbill feature from the Proposed Development in combination with other plans or projects can be excluded.
- 6.6.213. A similar consideration applies to the guillemot feature. NE advised that a decline in growth rate of no more than 0.4% would avoid in-combination AEoI. Notwithstanding the SoS decision on the Norfolk Vanguard OWF, the ExA remains concerned that it does not have the evidence to conclude that effects would remain within these ranges. The ExA therefore does not agree that AEoI of the guillemot feature from the Proposed Development in combination with other plans or projects can be excluded.

Seabird assemblage – all effects

- 6.6.214. The seabird assemblage comprises gannet, fulmar, kittiwake, guillemot, razorbill, puffin, herring gull, shag and cormorant. The Applicant stated that four of these species have been assessed as individual named features (gannet, kittiwake, guillemot and razorbill) and that there would be no adverse effects for these species due to the Proposed Development alone.
- 6.6.215. The Applicant considered that the remaining assemblage species (herring gull, shag and cormorant) to either have no likelihood of connectivity to the site due to limited foraging ranges or coastal preferences and are not considered to be at risk of impacts at OWFs (for instance fulmar, which flies at very low levels so has negligible collision risk and is not considered to be at risk of displacement); or were recorded in such low numbers that there is no risk of an impact on the population (such as puffin, with observations in February and March only and OWF plus 2km abundances of 6 and 23 in these months respectively, which gives an apportioned SPA population of less than 0.1 individual).
- 6.6.216. The Applicant concluded there would be no AEoI of the species populations which are components of the assemblage feature from the Proposed Development alone or in-combination with other plans or projects. It followed therefore that there would be no AEoI of the assemblage feature [REP2-035].

- 6.6.217. NE [REP4-040] agreed with this conclusion in relation to the effects from the Proposed Development alone but not for in-combination effects. It advised that effects on the assemblage feature should be assessed against the conservation objectives for abundance and diversity of the feature. It concluded that the abundance target of the assemblage would be met and that the assemblage diversity is not at risk from the in-combination collision and displacement impacts from offshore OWFs when the Hornsea Projects Three and Four OWFs are excluded from the in-combination totals.
- 6.6.218. NE advised [REP4-040] that an AEoI of the seabird assemblage feature of the SPA can be ruled out for collision and displacement impacts in-combination with other plans and projects when the Hornsea Projects Three and Four are excluded from the in-combination totals. As discussed in previous sections of this report, NE's concerns about the uncertainties associated with the baseline data for the Hornsea Projects Three and Four OWF prevented it from advising that an adverse effect on integrity can be excluded when these two projects are included in the in-combination total [REP4-040] and [REP9-057].
- 6.6.219. The Applicant [REP13-013] considered that NE's approach was over-precautionary and maintained its position that there would be no AEoI of the SPA. It noted that the SoS's Habitats Regulations Assessment [REP13-023] for the Norfolk Vanguard OWF concluded that the inclusion of the Hornsea Project Three OWF data did not affect the conclusions of the in-combination assessment.
- 6.6.220. The RSPB advised that it could not agree that AEoI of the seabird assemblage of the SPA could be excluded because of its outstanding concerns on in-combination effects on kittiwake, gannet, guillemot and razorbill [REP9-052], [REP10-068] and [REP15-013].
- 6.6.221. NE [REP14-064] and [REP14-065] and the RSPB advised [REP13-049] that their position had not changed following the SoS decision on Norfolk Vanguard OWF.

ExA's conclusions

- 6.6.222. The ExA is content that as AEoI of individual components of the assemblage can be excluded for the Proposed Development alone, there would be no effect on the integrity of the assemblage feature.
- 6.6.223. Given that it cannot exclude in-combination effects on all the individual species which make up the assemblage, the ExA considers that AEoI of the assemblage features cannot be excluded.

ExA's overall conclusions on Flamborough and Filey Coast SPA

- 6.6.224. The ExA is satisfied that AEoI of the SPA can be excluded for the Proposed Development alone. However, it cannot exclude AEoI from the Proposed Development in combination with other plans and project in relation to the kittiwake, guillemot and razorbill breeding features and the seabird assemblage.

Breydon Water SPA and Ramsar site

Collision risk of non-seabird migrants

- 6.6.225. The Applicant agreed to screen in an LSE for collision mortality of non-seabird migrants. It explained [AS-005] that non-seabird migrant collision risk modelling presented in [APP-556] found that predicted collisions apportioned to the Breydon Water SPA and Ramsar, Broadland SPA and Ramsar, and North Norfolk Coast SPA and Ramsar sites were very small, with none exceeding more than one individual per year for all three sites. These levels of additional mortality would not increase the background mortality rate by more than 1% and would therefore be undetectable against natural variations. In-combination collision mortality with the proposed adjacent Norfolk Vanguard and East Anglia THREE OWF were similarly very small (increases in background mortality rates remained less than 1%). The Applicant concluded there would be no AEoI on the integrity of these three SPA/Ramsar sites as a result of collisions from the project alone or in-combination with other plans and projects.
- 6.6.226. NE confirmed that it had no outstanding concerns regarding non-seabird migrants of North Norfolk Coast SPA, Broadland SPA and Breydon Water SPA [REP5-077]. Notwithstanding some methodological issues, it did not anticipate an AEoI of the SPA from collision risk from the Proposed Development alone or in-combination with other plans and projects [REP7-050].
- 6.6.227. The ExA is satisfied that AEoI of the Breydon Water SPA and Ramsar site would not arise from the Proposed Development alone or in combination with other plans or projects.

Broadland SPA and Ramsar site

Effects on ex-situ habitats to foraging swans and geese

- 6.6.228. During the Examination, the Applicant screened in an LSE for direct and indirect effects on ex-situ habitats to foraging swans and geese due to the temporary loss of crop stubble which provide overwintering habitat for these species during construction and decommissioning.
- 6.6.229. NE [RR-099] stated that without the mitigation that had been agreed on the Norfolk Vanguard OWF, it is not possible to rule out AEoI of the SPA.
- 6.6.230. In response, the Applicant updated Section 10.3 of the Outline Landscape and Ecological Management Strategy (OLEMS) [REP14-020] at D1 to include the following mitigation:
- a. A possible additional year of wintering bird surveys in advance of construction to be supported by an assessment of future cropping regime. This would aid understanding of whether the affected areas would otherwise have been managed in a way that would support foraging swans and geese. A second year of surveys may be undertaken (to be discussed with NE).

- b. Specific mitigation in the event that the surveys described are not undertaken or potential effects cannot be ruled out:
 - between October and March only one of the sections within the site (identified on Plate 1 of [REP1-020]) would be worked at any one time with the other managed as suitable alternative feeding ground; or
 - identification and management of a suitable area of land outside Order Limits (and no restriction on works within two areas).

6.6.231. Requirement 24 of the dDCO was also revised to stipulate that construction works within 5km of the Broadland SPA and Ramsar site must be carried out in accordance with the mitigation relating to onshore ornithology contained in the OLEMS.

6.6.232. NE confirmed that it was content with the mitigation proposed within the OLEMS and that there would be no AEoI of the Broadland SPA or Ramsar site from the Proposed Development alone or in-combination [REP3-022] and [REP7-050].

Collision risk of non-seabird migrants

6.6.233. As described for Breydon Water SPA and Ramsar site above, the Applicant agreed to screen in LSE for collision mortality of non-seabird migrants for these European sites. As for Breydon Water SPA and Ramsar site the Applicant concluded that the increase in background mortality rates would be undetectable against natural variations [APP-556] and therefore there would be no AEoI of the SPA or Ramsar site as a result of collisions alone or in combination with other plans or projects.

6.6.234. NE confirmed that it had no outstanding concerns regarding non-seabird migrants of the Broadland SPA [REP5-077] and confirmed at D7 [REP7-050] that notwithstanding some methodological issues, it did not anticipate an AEoI for the relevant features of these sites from collision related mortality from the Proposed Development alone or in-combination with other plans and projects.

6.6.235. The ExA is satisfied that AEoI of the Broadland SPA and Ramsar site would not arise from the Proposed Development alone or in combination with other plans or projects

Greater Wash SPA

Red-throated diver displacement during construction

6.6.236. The Applicant concluded that there would be no adverse effects on the Greater Wash SPA as a result of red-throated diver displacement from cable laying [APP-201]. However, NE [RR-099] advised the predicted impacts both alone and in-combination for the upper density figure (when applying 100% displacement and 10% mortality rates) may result in an adverse effect on red-throated divers. It therefore advised the Applicant to consider mitigation options for red-throated diver disturbance from offshore cable route laying, such as avoiding or

reducing cable laying activities during the non-breeding season/period of peak bird numbers.

- 6.6.237. In response, the Applicant revised Schedules 11 and 12, Part 4, Condition 19 of the dDCO to include a restriction of one cable laying vessel at any one-time during January to March inclusive. NE [REP4-040] and [REP7-050] subsequently agreed there would be no AEoI of the SPA from the project alone and in-combination, based on the Applicant's commitment to mitigation.

Red-throated diver displacement during operation

- 6.6.238. The Applicant's assessment [APP-201] concluded that the addition of vessels transiting to and from the port and the OWF (approximately 1.2 vessel movements per day) would have a negligible effect on the levels of shipping disturbance (an average of almost 100 vessel movements per day). The Applicant noted that despite this, NE still considers the potential for AEoI due to operation and maintenance vessels and stated that it would engage with NE to ensure that operational phase measures would be included in the DCO.
- 6.6.239. The Applicant [AS-024] confirmed that the following mitigation was included in the Outline Project Environmental Management Plan (OPEMP) [REP5-035], as secured through Schedules 9 and 10, Part 4, Condition 14(1)(d); Schedules 11 and 12, Part 4, Condition 9(1)(d); and Schedule 13 Part 4, Condition 7(1)(d) of the dDCO:
- a. avoid and minimise maintenance vessel traffic, where possible, during the most sensitive time period for RTD in January February/ March;
 - b. restrict vessel movements where possible to existing navigation routes;
 - c. avoid over-revving of engines (to minimise noise disturbance); and
 - d. avoid rafting birds either en-route to the array from operational port and/or within the array and where possible avoid disturbance to areas with consistently high diver density.
- 6.6.240. NE [REP4-040] and [REP7-050] subsequently agreed that there would be no AEoI of the SPA due to operation and maintenance vessel traffic.
- 6.6.241. The ExA is satisfied that AEoI of the Greater Wash SPA would not arise from the Proposed Development alone or in combination with other plans or projects.

North Norfolk Coast SPA and Ramsar site

Collision risk of non-seabird migrants

- 6.6.242. As described for Breydon Water SPA and Ramsar site above, the Applicant agreed to screen in an LSE for collision mortality of non-seabird migrants for these European sites. As for Breydon Water SPA and Ramsar site the Applicant concluded that the increase in background mortality rates would be undetectable against natural variations [APP-556] and therefore there would be no AEoI of the North Norfolk Coast SPA or

Ramsar site as a result of collisions alone or in-combination with other plans or projects.

- 6.6.243. NE confirmed that it had no outstanding concerns regarding non-seabird migrants of the North Norfolk Coast SPA, Broadland SPA and Breydon Water SPA [REP5-077] and confirmed at D7 [REP7-050] that, notwithstanding some methodological issues, it did not anticipate an adverse effect on the integrity of the SPA for the relevant features of these sites from collision risk from the Proposed Development alone or in-combination with other plans and projects.
- 6.6.244. The ExA is satisfied that AEoI of the North Norfolk Coast SPA and Ramsar site would not arise from the Proposed Development alone or in combination with other plans or projects.

Outer Thames Estuary SPA

Red-throated diver displacement during operation and maintenance

- 6.6.245. The Applicant's assessment [APP-201] identified that the addition of vessels transiting to and from the port and the Proposed Development (approximately 1.2 vessel movements per day) would have a negligible effect on the levels of shipping disturbance over and above the average of almost 100 vessel movements per day (derived from AIS data, and therefore not including smaller vessels). NE still considered there was potential for AEoI of the SPA due to operation and maintenance vessels.
- 6.6.246. During the Examination, the Applicant confirmed that best practice vessel operations would be adopted to minimise disturbance to red-throated diver during operational and maintenance activities, as included in the OPEMP [REP5-035] which is secured through Schedules 9 and 10 Part 4 Condition 14(1)(d), Schedules 11 and 12 Part 4 Condition 9(1)(d) of the dDCO; and Schedule 13 Part 4 Condition 7(1)(d) of the dDCO.
- 6.6.247. NE subsequently agreed an adverse effect on integrity can be ruled out for all features of the SPA [REP7-050].
- 6.6.248. The ExA is satisfied that AEoI of the Outer Thames Estuary SPA would not arise from the Proposed Development alone or in combination with other plans or projects.

Benthic ecology

Haisborough Hammond and Winterton (HHW) SAC

- 6.6.249. The offshore cable route for the Proposed Development would run through the SAC. The Applicant has identified the potential for the installation, maintenance and decommissioning of the cables to affect the sandbank and reef features of the SAC.
- 6.6.250. In its assessment the Applicant advised that NE had recently undertaken a condition assessment of the features within the SAC which concluded

that both features were in unfavourable condition. NE [RR-099] confirmed that this was the case and advised that restoration of the features would require a reduction or removal of pressures linked with human activities. The implications of this are discussed in the section below addressing temporary physical disturbance to the reef feature.

- 6.6.251. The Applicant's assessment of the effects on the SAC was based on a worst case scenario for effects during all phases of the Proposed Development; the parameters used to define the worst case scenario are summarised in [APP-201, Tables 7.3 and 7.4]. During decommissioning some or all of the export cables would be removed but permanent cable protection would be left in place. The effect of leaving cable protection in place is stated by the Applicant to have been included in its assessment of permanent habitat loss for the SAC features.
- 6.6.252. The Applicant predicted that, based on its professional experience, the Proposed Development would require on average one export cable repair per cable pair once every 10 years. Cable re-burial is expected by the Applicant to be required approximately once every 5 years. The assessment assumed that this would involve a 4km cable length per cable pair within the SAC, with disturbance extending over a 10m width from the cable repair [APP-201].
- 6.6.253. The assessment takes the following mitigation measures into account [APP-201]:
- a. use of HVDC to reduce the number of cables with a consequent reduction in trenching and associated operations and the space required for cable installation;
 - b. a pre-construction survey in advance of cable installation to plan the routeing of the cables;
 - c. micro-siting of the cables where possible to avoid features such as reef or unexploded ordnance (UXO) identified in the pre-construction survey - the cable route would be agreed with the relevant SNCBs;
 - d. a commitment to burying offshore export cables where possible to reduce the need for surface cable protection; cable protection would be limited to 10% of the cable length within the SAC;
 - e. use of sandwave levelling (described in [APP-201] as a dredging operation which removes material down to a stable reference seabed level) - this is intended to reduce the risk of cables becoming unburied and requiring cable protection installed during the operational phase;
 - f. all seabed material arising from cable installation within the SAC would be placed back in the SAC to ensure that the sediment is available to replenish the sandbank features - sediment would not be disposed of within 50m of the reef feature; and
 - g. production of a Site Integrity Plan (SIP) for the SAC would provide a framework to develop and agree the mitigation and monitoring measures required to avoid AEoI of the SAC -activities under the relevant DMLs would not begin until the MMO, in consultation with

the relevant SNCB, was content that the SIP would provide adequate mitigation.

- 6.6.254. Delivery of the SIP would be secured through a Grampian condition, preventing construction beginning until the MMO was satisfied, in consultation with NE that "*there was no adverse effect beyond reasonable scientific doubt on the SAC*" [REP1-033].
- 6.6.255. The only project considered in the Applicant's assessment of in-combination effects is the Norfolk Vanguard OWF. None of the IPs suggested that any other plans or projects should be included in the assessment. Effects from other activities such as fishing were considered by the Applicant to form part of the existing situation within the SAC.
- 6.6.256. The assessment assumed that the Norfolk Vanguard offshore cables would be installed first. The offshore cables for the Proposed Development would be installed shortly after but there would be no overlap between the two. Each installation could take up to 18 months to be completed, so the worst case scenario is expected to be an installation period of four years. The worst case scenario for the spatial footprint is for the area affected by the two projects to be exactly twice the area that would be affected by the Proposed Development alone [APP-201].
- 6.6.257. The Applicant's assessment considered the following effects on both the sandbank and reef features:
- a. temporary physical disturbance during all phases of the development;
 - b. permanent habitat loss (sandbank feature only);
 - c. introduction of new substrate in the form of cable protection; and
 - d. increased sediment deposition and smothering.
- 6.6.258. Its conclusion of no AEOI of the SAC rested on these main points:
- a. Even when the worst-case scenario is assessed for any of the effects only a very small percentage of the feature area and/or the total area of the SAC would be affected by cable installation, repairs and decommissioning.
 - b. The sediment transport processes which control the sandbank feature occur at a much larger scale than any area of temporary physical disturbance associated with sandwave levelling or the re-burial of cable.
 - c. *Sabellaria spinulosa* (*S. spinulosa*) reef is known to recover rapidly after disturbance.
 - d. The nature of the biological communities associated with the sandbank feature also means they would recover rapidly after disturbance.
 - e. The use of micro-siting would allow the avoidance of reef features from the Proposed Development alone or in combination with Norfolk Vanguard OWF.
 - f. The use of sandwave levelling would prevent cables becoming exposed during operation and so requiring cable re-burial/protection.

- g. The approach to depositing material cleared during sandwave levelling would ensure that sediment remained in the local transport system so that the sandbank feature would be maintained but would be far enough away from the reef feature to avoid smothering.
- h. Published scientific evidence shows that *S. spinulosa* is tolerant of disturbance and sediment smothering.
- i. *S. spinulosa* would rapidly colonise any cable protection and lead to the creation of new reefs.
- j. Effects from decommissioning would be similar or of lesser magnitude than those from construction.
- k. When the combined effects of the Proposed Development and Norfolk Vanguard OWF are considered, the percentage of the feature area or SAC area would still be very small.
- l. Both projects would use micro-siting to avoid reef features so there would be no in-combination effects on reef features. Even if micro-siting could not be carried out, the total extent of reef feature lost would be no more than 3.7% of the feature area.
- m. The effects on sandbanks would not be any greater for both projects than they would be for the Proposed Development alone because the effect of cable installation would be to leave a series of levelled sandwaves which would re-shape themselves naturally. The combined effect would not be sufficient to disrupt the form or function of the sandwave system within the SAC.

Temporary physical disturbance - sandbank feature

- 6.6.259. NE [RR-099] did not agree that AEOI of the SAC could be excluded. It agreed that the mobile nature of this particular sandbank system would make it more likely to recover from changes than other less dynamic systems although scarring is likely to remain in areas of coarser sediment. However, it noted that there is no empirical data relating to works on a similar spatial or temporal scale for this particular sandbank system to support the modelling. It remained concerned about potential impacts on the form and function of the sandbank sand wave fields and their potential to recover [RR-099].
- 6.6.260. NE advised [RR-099] that removing material would affect the structure of the sand banks, potentially changing sediment extent and distribution and/or result in a change to the composition of the biological communities. The Applicant [AS-024] stated that as all sediment would be disposed of within the SAC the total volume of sediment would not change (the excavated sediment is 0.05% of total sandbank volume); that the overall area of sandbank habitat would not change; and that any morphological changes are likely to be within the existing range. It reiterated the point that the biological communities are relatively species poor, they would not be altered significantly by cable installation and protection and the site would not lose the communities expected for the sandbank feature.
- 6.6.261. The Applicant [REP4-014] confirmed that the final disposal strategy would be agreed with the MMO in consultation with NE and included in the final version of the SIP. The MMO [REP4-034] and NE [REP4-043]

agreed that this approach was appropriate. The Applicant [AS-024] also advised the cable installation strategy would be agreed with the MMO in consultation with NE before works could commence. The strategy would be informed by any available evidence regarding recovery from other relevant projects. NE [REP7-053] welcomed the commitment to a cable installation strategy but stated that it does not alter its position that AEoI cannot be excluded.

- 6.6.262. NE advised that it is satisfied that the Applicant would be able to dispose of sandwave levelling material at locations that would keep material within the local sediment transport system [REP9-57]. However, it is concerned that there would be changes to sediment composition. It advised that [RR-099] dredged material should be more than 95% similar in particle size to material present at disposal locations.
- 6.6.263. NE [REP7-046] stated that the Applicant's proposed mitigation does not ensure that the sediment would be disposed of in areas of similar particle size. A further condition or requirement should be put in place to secure the disposal of material would be in an area with similar particle size [REP7-046] although NE also noted that it is uncertain how the Applicant would achieve this [REP14-066]. The MMO deferred to NE's position on this point [REP9-036].
- 6.6.264. The Applicant [REP4-014], [REP6-014] and [REP13-013] considered that the mitigation proposed is the most reliable and efficient way of ensuring that there would be no overall change in sediment composition, and that with this mitigation there is no need for a condition specifying particle size. It noted that sampling all dredged sediment and areas within the disposal site in order to determine 95% similarity is unfeasible. and that discussion of potential wording of a condition regarding sediment size is ongoing.
- 6.6.265. Discussions were held between the Applicant, NE and the MMO during the Examination but no agreement was reached on appropriate wording for such a commitment by the end of the Examination. The Applicant [REP13-013] advised that for the Norfolk Vanguard OWF decision, the SoS concluded that such a condition was not required [REP13-013].
- 6.6.266. NE [RR-099] and [REP9-057] noted in relation to operational effects that sandwave levelling does not always ensure that cables remain buried, leading to a requirement for cable protection and repeated disturbance during operation which could slow any post-construction recovery. The Applicant [AS-024] and [REP-057] explained that the worst case scenario for the operational phase is based on the potential for sub-optimal burial in the absence of sand wave levelling.
- 6.6.267. During the Examination, the Applicant committed to not using jack-up vessels within the SAC to reduce the extent of disturbance from vessel stabilisation [REP6-011] and [REP6-017]. The Applicant also undertook to provide a pre-construction sandwave levelling report [REP6-011] and [REP6-017].

- 6.6.268. NE [AS-028] and the MMO [REP2-051] advised that sandbank recovery should be monitored. The Applicant [REP1-042] confirmed that monitoring for sandbanks would be agreed with the MMO, in consultation with NE, prior to construction.
- 6.6.269. NE [REP7-053] was concerned that the Applicant's commitment to carry out post-construction surveys in [REP6-017] lacked detail, did not include any reference to a pre-construction survey and/or timeframes for post-construction surveys. It considered that the reference to post-construction surveys was too ambiguous to capture the ability of sandbanks to recover. The Applicant disputed this position and pointed to the timeframes in the In Principle Monitoring Plan (IPMP). NE subsequently agreed it was satisfied with the IPMP [REP13-038] and [REP13-010].

Temporary physical disturbance – reef feature

- 6.6.270. NE [RR-099] was concerned that it may not be possible for the Applicant to avoid reef through micro-siting of the offshore cables. It noted that the Triton Knoll OWF had not been able to do so [RR-099], [REP5-081] and [REP7-051]. NE [REP5-081] and [REP14-064] acknowledged that there is potentially enough space for the cables to avoid reef and features of archaeological interest. However, it stated that this does not take account of uncertainties as to what archaeological features are present, the ability to remove them and the likely discovery of further areas of reef once fisheries management measures are implemented by the relevant authorities.
- 6.6.271. NE advised [REP2-080] that the site is already in unfavourable condition with a conservation objective to restore it to favourable condition. The project would only be consistent with conservation objectives if all areas of *S. spinulosa* reef are avoided. It stated [REP4-043] and [REP7-051] that the whole site is made up of habitats that support designated features, with no "*site fabric*" (except an old pipeline) and that in order to have regard to the objective of restoring the site to favourable condition it is necessary to protect not only existing reef, but also areas where it is likely to return.
- 6.6.272. As part of the measures intended to restore the SAC features, NE [RR-099] explained that it had advised that two areas within the SAC are priority areas for management as reef. The EIFCA [RR-035] advised that restrictions on fishing activities would be introduced through the Restricted Area 36 of the draft Marine Protected Areas Byelaw 2019. Area 36 is one of the priority sites [REP4-022, Figure 1]. The second priority area is proposed to be included in a Defra fisheries management area within the SAC [RR-099].
- 6.6.273. NE [RR-099] and the Eastern Inshore Fisheries and Conservation Authority (EIFCA) [RR-035] pointed out that the Applicant's offshore cable would go through part of Area 36. While noting that the byelaw covering this area is intended to control damage from fisheries, the EIFCA seeks to encourage regulation of non-fishing activities that could cause damage to sensitive features [RR-035]. Both NE [RR-099] and the

EIFCA [RR-035], [REP2-045] and [REP5-069] requested micro-siting to avoid Area 36.

- 6.6.274. The Applicant [AS-024], [REP2-021], [REP4-022], [REP4-014], [REP6-013], [REP6-016], [REP8-014], [REP10-043] and [REP13-013] maintained throughout the Examination that the evidence was that micro-siting is likely to be possible. The space available for micro-siting within the offshore cable corridor is approximately 1.05km where the corridor width is 2km, rising to 3.75km where the corridor width is 4.7km [REP10-043]. The "*where possible*" caveat is necessary as it is not possible to be absolutely certain of reef extent in the future. It confirmed that the cable installation strategy must be agreed with the MMO in consultation with NE before works can commence and would be informed by any available evidence regarding recovery from other relevant projects.
- 6.6.275. In response to a question from the ExA, the Applicant [REP13-013] stated that where an area of seabed supports "*patchy*" reef, this would entail 10 to 20% of the seabed area supporting reef. This would allow plenty of room to microsite the cables. However, if areas of reef had expanded significantly then routing the cables through the areas of patchy reef would allow the "*actual*" reef to be avoided. The onus would be on the Applicant to demonstrate to NE and the MMO that the final cable route was avoiding all areas of actual reef.
- 6.6.276. The Applicant also disputed NE's point about the difficulties of micro-siting in the Triton Knoll OWF. It stated that the Triton Knoll OWF pre-construction survey did not identify any reef habitat within the project site, including within the Inner Dowsing Race Bank and North Ridge SAC so micro-siting was not actually required [REP9-010].
- 6.6.277. NE advised [REP14-065] that reef habitat has a clear boundary and it is highly improbable that a clear route could be found through a reef for one/two cables even in more patchy areas.
- 6.6.278. In relation to the EIFCA byelaw area the Applicant [REP5-051] responded that the byelaw area represents 1.5% of the section of the offshore cable within the SAC so there was sufficient space to microsite around it. However, it did not commit to avoiding cable installation altogether within Area 36 as the results of the pre-construction surveys may show that reef is more extensive in the area south of the byelaw area. In this case if cable was routed to the south of Area 36, the extent of reef habitat would actually decrease. The EIFCA maintained its position that the Applicant should commit to avoiding Area 36 [REP9-019].
- 6.6.279. With regard to the proposed Defra fisheries management area (the second reef priority area) NE [RR-099] advised that it may not be practical for the cable route to completely avoid the area. Instead as a minimum, the area of high confidence reef within the fisheries management area should be avoided in its entirety. However, it confirmed [REP5-081] that reef within fisheries management areas are

no more important than any other areas of reef and that all reef within the SAC should be conserved.

- 6.6.280. The Applicant [REP5-051] and [REP6-013] acknowledged that the proposed fisheries management area does span the cable corridor but stated that the cable corridor is wider at this location therefore there is greater space to microsite. It noted that the byelaw is not anticipated to be implemented in advance of offshore construction and that there is no guarantee that it would lead to reef recovery. It queried the reliability of the evidence used to define the reef management areas [REP8-014]. It also noted that the area has two pipelines and an out of service cable crossing it [REP9-010].
- 6.6.281. It considered that a 4.7km stretch of reef would be exceptional and did not believe that the Defra proposed fisheries management closure would result in a significant reduction in fishing pressure (as vessel monitoring showed little fishing activity in the majority of the offshore cable corridor) and therefore a significant increase in reef extent before construction is unlikely [REP5-057], [REP8-014], [REP9-010], [REP11-008] and [REP13-013]. Furthermore, it highlighted recent research finding reef in areas with high levels of fishing pressure. The EIFCA also stated that fishing pressure within 0 – 6nm of the coast is low [REP10-055].
- 6.6.282. The Applicant also took the view that even if micro-siting was not possible, the extent of reef that would be lost if it had extended across the full width of the cable route, would still represent a de minimis loss of the feature [REP8-014] and [REP10-043], with a worst case scenario leading to a loss of 0.004% of the SAC area (in combination with Norfolk Vanguard OWF), and 0% loss within the priority reef management areas. It noted at D13 that the SoS had agreed that there would be no in-combination effects as a result of cable installation from the Proposed Development and Norfolk Vanguard OWF [REP13-013].
- 6.6.283. NE stated that the concept of de minimis is not found in relevant law or guidance and the correct approach is to consider the existence, or not, of AEoI of the site, rather than whether adverse effects are large or small. It considered the worst case scenario should be assessed. On this basis, it could not rule out AEoI. It acknowledged that the areas of reef affected would be small when expressed as a percentage of site area and actual or potential areas of reef within the site, but any loss of protected habitat is a matter of significance. It did not agree with the Applicant's caveat of avoiding reef "*where possible*" as there are no parameters to assess and agree what is possible [RR-099].
- 6.6.284. The Applicant argued that NE's current position means that the SAC would effectively become an exclusion zone with no development able to take place until the fisheries management measures are in place and reef recovery has been demonstrated [REP8-014]. It maintained that the evidence provided during the Examination [REP8-014] demonstrated that the scale of loss met the definition of de minimis loss given in NE's D1 representation [REP1-057]. It also cited several other national infrastructure projects where the relevant SoS had agreed that the loss

of qualifying habitat features or supporting habitat had not constituted an adverse effect on integrity [REP6-019], [REP8-014], [REP10-034] and [REP10-042]

- 6.6.285. The Applicant stated that as the current extent of reef is unknown, it is not possible to quantify what would constitute favourable condition. It agreed that the distribution of reef may change prior to construction but considered it unlikely that the overall extent would change [REP8-014]. It also pointed out that the area identified as reef by the SAC designation documents was approximately 0.9km². The area proposed by the SNCBs to be managed as reef would be approximately 88km², which is an order of magnitude larger. These are not necessarily areas where reef is known to occur or has been known to occur in the past [REP8-014].
- 6.6.286. NE [REP7-051] acknowledged it has taken a precautionary approach in its conclusions regarding the extent and distribution of reef, the spatial extent and impact of fishing and the restore objective, but stated this is consistent with its approach in all other plans or projects affecting the SAC.
- 6.6.287. NE [RR-099], [REP2-080] and [REP4-014] also disputed the capacity of the reef feature to recover. It advised that the evidence presented in [APP-201] predominantly related to individuals/abundance and does not take into account repeated impacts or those resulting from cable protection. Whilst NE did not disagree there is evidence that reef can develop on disturbed grounds (including where cables have been installed), it stated that there is no evidence to support recovery of existing/established Annex I reef from the effects of cable installation. It also highlighted evidence from the Wadden Sea that recovery has not occurred from impacts caused by bottom trawling activities. The SoS decision on Norfolk Vanguard OWF did not alter NE's position as in its view while some recovery might occur, it could not be substantiated that this recovery would be enough to avoid undermining the SAC's conservation objectives [REP14-065].
- 6.6.288. The Applicant disputed NE's statement that the published evidence only refers to individual recruitment of *S. spinulosa* and cited several sources of published evidence which referred to recovery of reef rather than just individuals [AS-024], [REP9-010] and [REP10-042]. It pointed out that NE is expecting reef recovery to occur once fisheries closures are in place [REP10-042].
- 6.6.289. In the Applicant's view cable installation was a one-off activity which would allow the reef to recover unlike fishing where trawling damage was likely to be repeated. Cable laying would take less time than the life cycle of *S. spinulosa* and therefore recovery would be rapid [REP8-014] and [REP13-013]. The EIFCA agreed that cable installation was only temporary in duration but noted that the magnitude of effects was much greater than the effects from trawling [REP9-019]. NE cited evidence from research in Morecambe Bay in areas subject to intensive trawling, which showed there has been a loss of *S. spinulosa* which has not recovered [REP14-065].

- 6.6.290. The Applicant [REP4-014] and [REP5-057] considered that given the level of scientific uncertainty in determining the extent of the reef and its current condition (noting that scientific certainty is not possible to obtain) and the mitigation now agreed by the Applicant, the assertion that NE cannot be confident that there would be no AEoI is not proportionate to the risk of potential small effects on the site in the worst-case scenario. The known areas of reef may change due to its ephemeral nature and that the extent to which reef would recover in areas to be managed as reef or where fisheries byelaws are proposed is not known, therefore the proposed Grampian condition and use of the SIP would ensure no AEoI of the SAC.

Permanent habitat loss – cable protection

- 6.6.291. The Applicant's assessment [APP-201] did not assess impacts of habitat loss on reef. It [REP6-005] considered that permanent habitat loss for reef should be excluded because there is evidence to suggest that cable protection was likely to be colonised by *S. spinulosa* providing replacement or additional areas of the feature. Furthermore, it considered that reef was likely to be avoided by micro-siting, making the issue of cable protection within existing reef features irrelevant.
- 6.6.292. NE [RR-099], [REP1-057] and [REP4-043] considered that the addition of any hard substrata is often incompatible with the conservation objectives for the SAC and could result in lasting change. It stated [REP1-057] that it would usually consider permanent, long-lasting and irreversible loss to be an adverse effect unless the following can be demonstrated:
- a. that the loss is not on the priority habitat/feature/ sub feature/ supporting habitat; and/or
 - b. that the loss is temporary and reversible; and/or
 - c. that the scale of loss is so small as to be de minimus alone; and/or
 - d. that the scale of loss is inconsequential including other impacts on the site/ feature/ sub feature.
- 6.6.293. The Applicant [REP6-016], [REP10-034] and [REP10-42] considered it had met NE's definition of habitat loss qualifying as de minimis and was confident that a conclusion of no AEoI could be reached at the pre-consent stage. It maintained this position throughout the Examination but at various stages proposed various additional changes and controls on the extent of cable protection:
- a. a reduction in the extent of cable protection within the SAC from 10% to 5%, after an interim cable burial study [REP6-011, Appendix 2] demonstrated that at least 95% of the export cable within the SAC could be buried;
 - b. attempt to rebury cables that become exposed within the SAC during operation before installing cable protection;
 - c. to seek a separate Marine Licence if new areas of cable protection are required during maintenance;
 - d. to decommission cable protection at the end of the life of the Proposed Development where it is associated with unburied cables

- due to ground conditions (although where required for crossings, cable protection would be left in place);
- e. to progress agreements for the removal of disused cables to minimise the number of crossing locations that would require cable protection;
- f. to avoid the use of rock armouring for cable protection within the SAC; and
- g. to avoid placing cable protection within the areas identified as being priority management areas for reef (but only these areas, the commitment did not apply to areas beyond these boundaries), unless otherwise agreed with the MMO in consultation with NE.

- 6.6.294. These commitments are secured through the CSIMP and SIP. The Applicant also provided information on the feasibility of decommissioning cable protection [REP6-018]. The Applicant [REP10-043] confirmed at D10 that it had reached agreement with BT Subsea and Deutsche Telekom AG to cut a number of out of service cables, reducing the requirement for cable crossings within the SAC to two.
- 6.6.295. NE [REP4-043] recognised that the area of cable protection may be quite small-scale in relation to the whole SAC area but it considered there to be a high probability that the conservation objectives would be hindered, and that cable protection within 5% of the cable corridor route would have a lasting effect. Furthermore, it highlighted the importance of areas in-between protected features for the functioning of those features [REP4-038], [REP4-041], [REP4-043], [REP5-078], [REP5-081], [REP9-039], [REP9-044] and [REP9-057]. NE considered that the areas mostly likely to require cable protection are within mixed sediment areas between the sandbanks which are the most likely to support reef [REP9-039].
- 6.6.296. NE requested that the pre-construction survey be secured through Condition 9 of Schedules 11 and 12. It welcomed the Applicant's additional commitments and advised that they reduced the risk of AEoI [REP10-064]. However, NE maintained its position throughout the Examination that AEoI of the SAC from cable protection could not be excluded beyond reasonable scientific doubt [REP10-064] It advised that no cable protection should be placed within the SAC.
- 6.6.297. The Applicant stated that it was not possible to make such a commitment until further ground investigation work had been completed [REP8-014]. It concluded that cable protection within the sandbank feature would undergo periodic burial and uncovering, making the effects of cable protection as persistent rather than permanent [REP6-019]. NE [REP9-044] agreed that effects would be persistent but taking a precautionary approach, it has to be assumed that cable protection would be exposed more often than it would be covered
- 6.6.298. NE [REP9-038], [REP9-039], [REP9-043], [REP9-044] and [REP9-057] agreed that impacts associated with decommissioning cable protection within the SAC could be viewed as long-term rather than permanent. However, that would still leave an impact of over 30 years on the SAC (the lifetime of the Proposed Development plus recovery time) which

could not be considered as a small scale loss or change. In its view, for removal at decommissioning to be considered as mitigation, cable protection would need to be restricted to concrete mattresses or similar [REP15-009] and [REP16-009].

- 6.6.299. NE also raised concerns about the potential limitations of the evidence relied on in the Applicant's interim cable burial assessment [REP9-038], [REP9-039] and [REP9-043]. In NE's view, no evidence had been presented about the long-term nature of the effects or if recovery would be feasible, notwithstanding the SoS reasoning on Norfolk Vanguard OWF [REP9-044], [REP14-067] and [REP14-065]. However, it did agree that if cable protection is limited to concrete mattresses or similar then this would be likely to enable natural processes to occur [REP9-044] and [REP13-038].
- 6.6.300. The Applicant [REP10-042] stated that it believes that NE's request for the use of concrete mattresses is due to a desire to restrict the height of the cable protection to enable natural processes to occur. In its view this height limit has been used throughout its assessments.
- 6.6.301. The Applicant noted [REP13-013] that the SoS appropriate assessment for the Norfolk Vanguard OWF stated that the SoS was not aware of any evidence as to why similar sandbank SAC features would not recover following the removal of infrastructure above or protruding from the seabed [REP13-013]. It also stated that as no OWF in UK waters has so far been decommissioned, it is not possible to provide the evidence which NE requires to conclude no AEOI of the SAC [REP13-013].
- 6.6.302. NE agreed that it was unaware of any evidence of sufficient quality [REP13-038]. It noted that the SoS comments about sandbank features recovering after decommissioning refer to the Dogger Bank OWF decision from 2015. Knowledge of decommissioning techniques and potential impacts have evolved since then; decommissioning is an issue that is proving difficult to challenge at the pre-construction phase. In addition, the Dogger Bank sandbank system is a fixed glacial till which has different characteristics to the more dynamic system in the SAC, although this could be viewed as a positive as dynamic systems have more chance of recovery [REP14-065]. NE also noted that cable protection at crossings would be left in place so this would represent a permanent impact [REP14-065].
- 6.6.303. In response to a question from the ExA, the Applicant [REP14-036] advised that decommissioning would be subject to a separate licence supported by an ES. For the export cables within the SAC it would be agreed with the relevant authorities whether cables as well as cable protection would be removed from the seabed. However, current best practice in the UK is that buried offshore cables are cut at the end and left in situ. This is because of the risk that greater damage could be caused to sensitive features by removing the buried cable than leaving them in place. Where cable protection is being decommissioned, leaving sections of exposed cable which could pose a safety risk to other marine

users, it would be appropriate to remove sections of cable. NE agreed with this advice [REP15-009].

- 6.6.304. At D13 the Applicant [REP13-013] included a new condition in the dDCO (Condition 20 of Schedules 11 and 12 [REP13-008] and [REP13-009]). This would require a cable protection decommissioning plan within the SAC to provide confidence that the cable protection could be decommissioned, in line with the DCO for Norfolk Vanguard OWF. The revised condition would replace the commitment not to use rock or gravel dumping within the SAC (Condition 3(1)(g) of Schedules 11 and 12).
- 6.6.305. NE suggested alternative wording which was not agreed with the Applicant [REP14-036], [REP14-064] and [REP15-003]. Both NE and the MMO expressed a preference for a requirement in the DCO rather than a condition on the transmission DMLs as the Applicant had proposed [REP14-036], [REP15-007] and [REP16-022].
- 6.6.306. As it was not possible to agree the wording the Applicant decided to reinstate a revised version of Schedules 11 and 12 Part 4 Condition 3(1)(g) with wording agreed by the three organisations [REP14-036], [REP14-058] and [REP14-064]:
- "(g) in the Haisborough, Hammond and Winterton Special Area of Conservation, cable protection must not take the form of rock or gravel dumping where it is deployed to protect export cables apart from at cable crossing locations with existing cables and pipelines."*
- 6.6.307. While the Applicant preferred to rely on Condition 3(1)(g) and remove Condition 20, it advised that it was content for the SoS to choose whether Condition 20 should be applied to the transmission DMLs or to be included as a requirement within the DCO [REP15-003] and [REP15-003]. The MMO [REP14-058], [REP15-007] and [REP16-022] expressed considerable concern about the version of the condition attached to the Norfolk Vanguard OWF DCO. It would prefer to see the condition removed from the dDCO but agrees with the Applicant and NE that it is for the SoS to make the final decision [REP14-058] and [REP14-064].
- 6.6.308. NE advised that both Condition 3(1)(g) and a version of Condition 20 should be included in the DCO [REP16-024]. The wording of the condition has been agreed with the Applicant and the MMO [REP16-004], [REP15-009], [REP16-022] and [REP16-024]. It would secure a decommissioning feasibility study on the cable protection during the operation of the Proposed Development and a monitoring plan. The Applicant also provided alternative wording that could be used in the event that the SoS chose to attach a requirement to the DCO rather than using a condition on the transmission DMLs [REP16-004].
- 6.6.309. NE [RR-099] and the MMO [RR-069] also raised concerns about potential impacts from additional cable protection being installed during the operational phase of the Proposed Development. In the MMO's view, any activities undertaken after construction ends would require a separate

licence. The Applicant [REP16-009] confirmed that a new Marine Licence would be sought if additional cable protection was required during operation.

- 6.6.310. The Applicant [REP6-007] considered that AEoI could be concluded without this commitment and the commitment to decommission cable protection at the end of the project life. These additional measures would ensure that areas to be managed as reef would be avoided and that there would be no permanent habitat loss as a result of cable protection. The scale of the habitat loss meets NE's definition of small scale loss.
- 6.6.311. NE agreed that if micro-siting is possible so that all reef features were fully avoided and no cable protection is required within the fisheries management areas it would be possible to reach a conclusion of no AEoI of the reef feature [REP9-057].

Introduction of new substrate during operation – cable protection

- 6.6.312. The Applicant concluded that the areas of the sandbank feature affected represent such a small area of the SAC that they could not have a significant effect on the supporting processes of the sandbank feature or the associated biological communities. The SAC's conservation objectives would not be undermined so there would not be an adverse effect on site integrity from the Proposed Development alone or in combination with Norfolk Vanguard OWF [APP-201].
- 6.6.313. This conclusion was not disputed during the Examination. NE [REP9-057] noted that the Applicant would be required to seek a further Marine Licence if additional cable protection was required during operation.
- 6.6.314. In relation to the reef feature, NE [RR-099], [REP7-048] and [REP7-051] agreed that *S. spinulosa* could colonise rock protection but did not consider the establishment of *S. spinulosa* reef on artificial substrate as "counting" towards favourable condition of the feature and/or site. This is because it is not a replacement for *S. spinulosa* reef on natural site sediment as set out at the time of designation and within the conservation advice package for the site.
- 6.6.315. The Applicant [AS-024] maintained that any reef, regardless of what it is growing on, would have the same effect on biodiversity and would also provide spawning stock for *S. spinulosa* which would help to ensure re-establishment of reef on nearby natural substrates. It noted that the large area to be managed as reef (in Defra's proposed fisheries byelaw area) is located on existing pipelines and that NE's advice to the MMO for protecting designated features in the SAC states that

"Sabellaria spinulosa reef extent is identified along the Baird Bacton pipeline, as in the HHW SAC SAD [Selection Assessment Document] and Regulation 35 package".

Increased suspended sediment and smothering – sandbank feature

- 6.6.316. As noted above, the Applicant did not consider that LSE would arise on the sandbank feature from this effect so it was not included in its original assessment of effects on the integrity of the SAC. The Applicant maintained this position but offered the following justification for the absence of AEoI from this effect:
- a. increases in suspended sediment would be small, localised and only temporarily exceed normal background levels;
 - b. deposition of the material would be limited, only changing the level of the sandbanks by between 0.2 – 0.8mm which would not lead to a detectable change in the form of the sandbanks;
 - c. sandwave levelling would only take place on the sandbanks and not the troughs between so only one sub feature of the SAC would be affected;
 - d. the level of smothering on the biological communities would be very low; and
 - e. the typical biological communities are made up of species which are adapted to disturbance and which can re-establish quickly.
- 6.6.317. NE agreed that AEoI of the SAC from the effect on this feature can be excluded [REP9-057].

Increased suspended sediment and smothering – reef

- 6.6.318. As noted above, the Applicant's HRA Report [section 7.3.1.5 of APP-201] confirmed that sediment from cable installation activities would not be disposed of within 50m of *S. spinulosa* reef. NE [RR-099] considered a 500m buffer to be more appropriate and noted that if sediment is surface released this needs to be taken account of to ensure the resting place of the bulk of material is a minimum of 50m from the *S. spinulosa* reef. The MMO [RR-069] also queried the adequacy of the buffer zone.
- 6.6.319. Although the Applicant considered that AEoI could be excluded [REP6-007] and [REP9-010] without further measures, it made the following additional commitments, intended to provide comfort to NE and the MMO:
- a. disposing of any material dredged from the seabed for sandwave levelling in a linear "strip" along the cable route;
 - b. disposing of material close to the seabed via a fall pipe (also referred to as a down pipe) employed by the dredging vessel to ensure it remains more than 50m away from *S. spinulosa* reef; and
 - c. applying specific criteria when determining the location of disposal areas within the SAC.

Appropriateness of the SIP/CSIMP

- 6.6.320. Both the MMO [RR-069], [AS-027], [REP1-058], [REP3-017], [REP4-035], [REP10-060], [REP15-007] and [REP17-008] and NE [RR-099], [AS-028], [REP4-041], [REP4-043], [REP9-034], [REP9-035] and [REP14-065] raised concerns regarding the use of a SIP. Both bodies considered that it would not be appropriate to use in circumstances where a worst case scenario can be identified and assessed at the pre-

application stage. They also considered the Applicant's proposed condition does not allow for the project to proceed under derogation.

- 6.6.321. Both IPs made a distinction between the use of the SIP for this SAC compared with the use of a SIP for the SNS SAC. The Applicant's assessment for the SNS SAC provided sufficient evidence that the only significant risk came from the combined effects of piling at different OWFs. The degree of uncertainty that appropriate mitigation can be delivered is much less than it is in the case of the HHW SAC SIP [REP7-051], [REP9-034] and [REP9-040]
- 6.6.322. The MMO [REP4-035] was concerned that the SIP would result in extra regulatory governance near to activity commencing and that it may have to issue a stop notice if the SIP conditions were not met. They maintained their concerns about the use of the SIP [REP9-034], [REP9-035] and [REP10-058].
- 6.6.323. NE [REP4-041] and [REP4-043] stated that the SIP was predicated on the assumption that it would be possible to avoid AEoI by adjusting methods within the Order Limits. It also considered that this cannot be concluded in absence of information about the presence of reef, the methods to be used and the cable route. NE advise [REP7-051] and [REP9-040] that the Applicant points out that the purpose of the Grampian condition is to "*verify previous assessments*" and noted that there is a possibility that the condition's mechanism will not verify previous assessments, because previous assessments may be superseded by events. NE agreed that this represented a change from its advice to the Norfolk Vanguard Examination but advised this was because of legal advice it had subsequently received [REP14-065].
- 6.6.324. The Applicant [AS-024], [REP1-042], [REP4-014], [REP8-014] and [REP10-034] considered that it had assessed a worst case scenario of potential effects and had concluded that the proposed mitigation was sufficient to conclude that there would be no AEoI. It was not therefore deferring an appropriate assessment. It stated it was not reliant on the Grampian condition, however the SIP provided added comfort, control and confidence to NE and the MMO to verify that the assessment undertaken at this point remain accurate at the point of cable installation. It considered that it will not be known until construction whether any impacts would actually arise and that if NE's position was accepted, it would never be possible to rule out adverse effects due to the ephemeral nature of *S. spinulosa* reef.
- 6.6.325. Despite this position, at D6 the Applicant proposed the use of a Cable Specification Installation and Monitoring Plan (CSIMP) which would secure the mitigation but not require the use of a Grampian condition. It would not require any further consideration of AEoI by the MMO.
- 6.6.326. The Applicant referred to the SIP and the CSIMP as together comprising "*the SAC Control Document*". In order to give the SoS a choice between relying on the CSIMP or the SIP [REP6-016], the Applicant included two versions of Condition 9(m) of Schedules 11 and 12 (the transmission

DMLs) of the dDCO. One version secures the CSIMP while the other version secures the SIP [REP18-009].

- 6.6.327. The Applicant [REP13-013] noted that in the Norfolk Vanguard OWF decision the SoS viewed the SIP as an additional safeguarding mechanism which was not critical to its recommendation. In the Applicant's view this supported the use of the CSIMP as it included the same mitigation measures as the SIP but without requiring a Grampian condition. However, it chose to retain the two versions of Condition 9(m) to allow the SoS to choose. The final versions of the SIP [REP14-033] and [REP14-034] and the CSIMP [REP14-031] and [REP14-032] were submitted at D14.
- 6.6.328. NE [REP7-051] and [REP14-064] stated that the proposal to use a CSIMP would not resolve the problems of uncertainty. For legal purposes a future CSIMP would represent a plan or project that would have to be subjected to appropriate assessment during the process of approval by the MMO. Depending on circumstances existing at the time of submission of a CSIMP to the MMO the appropriate assessment is capable of concluding that there would still be AEoI in the same way as with the SIP process. NE noted [REP14-064] that the CSIMP contained all known mitigation measures but this did not remove the need to consider the feasibility of mitigation at the pre-construction stage.
- 6.6.329. The MMO also raised concerns that there would be a need for further consideration of AEoI at the point of condition discharge leading to a risk of delays for the Applicant [REP9-034], [REP9-035], [REP9-036] and [REP10-060].
- 6.6.330. The Applicant's position was that the MMO, as the regulatory body for marine activities, would be the competent authority for the purposes of undertaking any further assessment of effects on European sites as they would be for the discharge of any Marine Licence condition. In its view this did not preclude carrying out an appropriate assessment at the consenting stage based on a worst case scenario. It argued that there would be no requirement to undertake a further appropriate assessment if the impacts at the point when the condition was discharged were no greater than those assessed at the consenting stage [REP8-014], [REP10-034] and [REP11-007].

ExA's conclusions

- 6.6.331. It appears to the ExA that the conservation objectives of the HHW SAC most likely to be affected by the Proposed Development (alone or in combination with Norfolk Vanguard OWF) are to:
- a. maintain and restore the extent and distribution of qualifying features;
 - b. maintain and restore the structure and function (including typical species) of qualifying natural habitats; and
 - c. maintain and restore the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely.

- 6.6.332. The ExA agrees with the Applicant that the in-combination assessment should be restricted to Norfolk Vanguard OWF. As detailed in the SNS SAC considerations, the ExA also agrees that fishing should be considered as part of the baseline.

Conclusions on the effect of temporary physical disturbance - sandbank feature

- 6.6.333. The ExA considers that the key question for the sandbank feature is whether this would be likely to be fully restored following cable installation. All parties agree that the mobile nature of this particular sandbank system would make it more likely to recover from changes than other less dynamic systems although scarring is likely to remain in areas of coarser sediment. The ExA accepts NE's concern that there is no empirical data relating to works on a similar spatial or temporal scale for this particular sandbank system to support the Applicant's modelling, so a precautionary approach is recommended.
- 6.6.334. There is no dispute that removing material would affect the structure of the sandbanks, potentially changing sediment extent and distribution and/or resulting in a change to the composition of the biological communities. The debate during Examination was about the effectiveness of the Applicant's mitigation measures in avoiding these effects. The ExA is content that all sediments would be disposed of within the SAC, so no material would be lost to the SAC and that the overall area of sandbank habitat would not change. The ExA understands NE's concerns that there would be changes to sediment composition and its advice that dredged material should be more than 95% similar in particle size to material present at disposal locations. However, the ExA also accepts the Applicant's view that sampling all dredged sediment and areas within the disposal site in order to determine 95% similarity is unfeasible. The ExA is also aware that NE is uncertain regarding the feasibility of how the Applicant could achieve this.
- 6.6.335. The ExA recognises that the Applicant, while maintaining that its proposed mitigation would be the most reliable and efficient way of ensuring no overall change to sediment composition, committed during the Examination to avoid the use of jack-up vessels within the SAC and to provide a pre-construction sandwave levelling report and to monitor sandbank recovery.
- 6.6.336. Taking all this into consideration, the ExA believes that the Applicant has taken all reasonable measures to aid recovery of the sandbanks within the SAC but due to the uncertainties related to sandbank modelling and changes to sediment composition due to disposal of dredged material there remains doubt over whether the sandbanks would fully recover following cable installation. Therefore, while accepting that biological communities associated with the sandbanks are relatively resilient to disturbance, the ExA concludes that the doubts about recovery of the sandbank leads to its recommendation that it cannot be concluded that the conservation objectives relating to extent and distribution and structure and function of the feature would not be undermined. AEoI of

the sandbank feature from the Proposed Development alone or in combination with other plans or projects cannot be ruled out.

Conclusions on the effect of temporary physical disturbance – reef feature

- 6.6.337. Considering the effects of cable installation on reef features, the confidence around the ability to microsite to avoid these features is compromised by the ephemeral nature of the reef and the inability to predict its presence and extent prior to construction. Features of archaeological interest which have not yet been mapped also have to be taken into account. The ExA understands NE's concern that while there is potentially enough space for the cables to avoid reef and features of archaeological interest, there is currently a high degree of uncertainty as to what archaeological features are present, the ability to remove them and the likely discovery of further areas of reef once fisheries management measures are implemented.
- 6.6.338. Referring to the conservation objectives, the ExA accepts NE's advice that the SAC is already in unfavourable condition with a conservation objective to restore it to favourable condition. NE, as the Government's statutory advisors, advise that the Proposed Development would only be consistent with the conservation objectives if all areas of *S. spinulosa* reef were to be avoided. As the whole site is made up of habitats that support designated features, with no "site fabric" (except an old pipeline) in order to restore the site to favourable condition it is necessary to protect not only existing reef, but also areas where it is likely to return.
- 6.6.339. While micro-siting is likely to be possible within the cable corridor width, the ExA has considered the level of confidence that reliance on micro-siting can give to avoid reef features. Referring to "patchy" reef, which is defined as 10 to 20% of the seabed area supporting reef, NE advise that reef habitat has a clear boundary and it is highly improbable that a clear route could be found through a reef for one or two cables even in more patchy areas. The Applicant's view is that there is space for micro-siting and routing cables through the areas of patchy reef could allow "actual" reef to be avoided.
- 6.6.340. For Restricted Area 36, the ExA agrees with NE and EIFCA that micro-siting should be used to avoid this area. Based on the evidence presented during Examination, the ExA believes that on the basis of current evidence, there is sufficient space to microsite the cable routes around this area. The ExA understands the Applicant's resistance to committing to this, as it may find at pre-construction that the reef is more extensive in the area south of the byelaw area. However, this does lead to an element of uncertainty.
- 6.6.341. With regard to the proposed Defra fisheries management area, a similar position exists, in that the ExA agrees with the Applicant that the cable corridor would allow for micro-siting around the area but the Applicant has caveated this mitigation by "where possible" as it is not possible to be absolutely certain of the reef extent in the future.

- 6.6.342. It is accepted by all parties that the current and future extent of reef is unknown, therefore the ExA concludes that there cannot be sufficient certainty that micro-siting can be achieved at this time to avoid all reef features. There is also potential for cable installation to undermine the management measures intended to restore the SAC to favourable condition. The question then becomes would the loss of reef calculated under the Applicant's worst case scenario represent a significant loss of the reef feature?
- 6.6.343. The ExA acknowledges that the SoS had previously agreed that there would be no in-combination effects as a result of cable installation from the Proposed Development and Norfolk Vanguard OWF. However, NE still maintains that in its view while some recovery might occur, it could not be substantiated that this recovery would be enough to avoid undermining the SAC's conservation objectives.
- 6.6.344. The ExA's final conclusion on the effects of cable installation on reef features hinges on the concept of significance. NE considers significance in terms of compliance with the SAC's conservation objectives, hence "*any loss of protected habitat is a matter of significance*". The Applicant's view of significance is based on the percentage loss of the area of a feature and that this would be de minimis. The ExA is concerned that there is insufficient scientific evidence to understand the impact of disruption to reef features and their ability to recover. It has carefully considered the advice given by NE, as the Government's statutory advisors, and the fact that the Applicant accepts that scientific certainty is not possible to obtain. The ExA therefore advises that on balance, it accepts the advice of the Government's statutory advisors and concludes that in terms of the implications for the SAC's conservation objectives, AEoI of the site cannot be ruled out.

Conclusions on the effect of cable repairs

- 6.6.345. During operation, repairs to the offshore cables would be required. The Applicant concludes that the areas of sandbank feature affected represent such a small area of the SAC that it could not have a significant effect on the supporting processes of the sandbank feature or the associated biological communities. This conclusion was not disputed during the Examination.
- 6.6.346. The ExA accepts that there are gaps in knowledge and that there is no definitive evidence that cable repairs would happen infrequently enough to allow the sandbank and reef features to recover. NE did not challenge the Applicant's view that the SAC's conservation objectives would not be undermined by repairs to the cables and that any additional cable protection would require an additional Marine Licence.
- 6.6.347. As cable repairs are estimated to be one every 10 years and damage from cable repairs would be much less than for cable installation, the ExA considers that there is enough precaution to advise that cable maintenance and repairs during operation would not adversely affect the integrity of the site.

Conclusions on the effect of permanent habitat loss – cable protection

- 6.6.348. The Applicant considered that, as it had made a commitment to decommission cable protection at the end of the life of the Proposed Development, the associated effects would be temporary. The decommissioning would be the subject of a separate Marine Licence and necessary assessment. As no OWF has been decommissioned after 30 years of operation, the ExA cautions that there is little evidence to support the idea that cable protection could be decommissioned after this time or to support the conclusion that both sandbank and reef features could recover after cable decommissioning.
- 6.6.349. Turning to permanent habitat loss of reef features resulting from cable protection, the Applicant considers that cable protection was likely to be colonised by *S. spinulosa* providing replacement or additional areas of the feature. NE's position is that colonisation of substrate by reef does not count as a proper reef feature and that the addition of any hard substrata is often incompatible with the conservation objectives for the SAC and could result in lasting change. The ExA agrees with NE's position that reef colonisation of cable protection does not constitute a replacement for reef that has developed on natural substrates.
- 6.6.350. Both parties acknowledge that cable protection within the sandbank feature would undergo periodic burial and uncovering, the ExA is minded to accept NE's position that cable protection represents permanent habitat loss for the sandbank feature.
- 6.6.351. Throughout the Examination, the Applicant and NE could not agree that the Applicant had met NE's generic definition of small scale habitat loss. The Applicant maintained that it had and therefore AEoI could be excluded. The ExA acknowledges that the Applicant has also proposed various additional changes and controls on the extent of cable protection during the Examination, which have been secured in the CSIMP and SIP. However, the ExA has taken cognisance of NE's advice that while the area of cable protection may be quite small-scale in relation to the whole SAC area, NE considers that there is a high probability that the conservation objectives would be hindered, and that cable protection within 5% of the cable corridor route would have a lasting effect. The ExA accepts NE's advice that AEoI of the SAC for either feature from cable protection could not be excluded beyond reasonable scientific doubt.
- 6.6.352. The ExA agrees with the Applicant and NE that where cable protection is being decommissioned, for safety reasons it would be appropriate to remove the associated sections of cable and this should be secured in the rDCO.
- 6.6.353. The Applicant and NE discussed a new condition in the dCDO (Condition 20 of Schedules 11 and 12) to provide confidence that cable protection could be decommissioned, but they failed to agree on the wording. The Applicant then reinstated a revised version of Condition 3(1)(g) with wording agreed by NE and the MMO:

"(g) in the Haisborough, Hammond and Winterton Special Area of Conservation, cable protection must not take the form of rock or gravel dumping where it is deployed to protect export cables apart from at cable crossing locations with existing cables and pipelines."

6.6.354. NE then advised that both this Condition and a version of Condition 20 should be included in the rDCO to secure the decommissioning of the cable protection within the HHW SAC. However, MMO required a revised version of Condition 20, which has been agreed with the Applicant, to be included as a Requirement in the dDCO, as additional paras (2) to (4) under Requirement 14, and not in the DMLs:

(1) No offshore works may commence until a written decommissioning programme in compliance with any notice served upon the undertaker by the Secretary of State pursuant to section 105(2) of the 2004 Act has been submitted to the Secretary of State for approval.

(2) The obligations under paragraphs (3) and (4) shall only apply in respect of cable protection, apart from at cable crossing locations with existing cables and pipelines, which is installed as part of the authorised project within the Haisborough, Hammond and Winterton Special Area of Conservation as at the date of the grant of the Order.

(3) No later than 4 months prior to each deployment of cable protection in the Haisborough, Hammond and Winterton Special Area of Conservation, except where otherwise stated or unless otherwise agreed in writing by the Secretary of State, the undertaker must submit the following documents for approval by the Secretary of State:

(a) A decommissioning feasibility study on the proposed cable protection to be updated at intervals of not more than every ten years throughout the operational phase of the project;

(b) A method statement for recovery of cable protection;

(c) A Monitoring Plan including appropriate surveys of cables situated within the Haisborough, Hammond and Winterton Special Area of Conservation that are subject to cable protection to assess the integrity and condition of that cable protection and determine the appropriate extent of the feasibility of the removal of such cable protection having regard to the condition of the cable protection and feasibility of any new removal techniques at that time, along with a method statement for recovery of cable protection;

(d) A monitoring plan to include appropriate surveys following decommissioning to monitor the recovery of the area of the Haisborough, Hammond and Winterton Special Area of Conservation impacted by cable protection.

(4) No cable protection can be deployed in the Haisborough, Hammond and Winterton Special Area of Conservation until the Secretary of State, in consultation with the MMO and the Statutory Nature Conservation Body approves in writing the documents pursuant to (3) above.

6.6.355. As there was no agreement between the Applicant, the MMO and NE on whether the revised Condition 20 should be reinstated, the parties agreed that it is for the SoS to make the final decision. The ExA has considered the arguments for and against including Condition 20 and recommend to the SoS that, if the SoS is minded to grant consent, Condition 3(1)(g) should remain in Schedules 11 and 12 and the additional paras agreed with the MMO should be included in the rDCO as new requirements under Requirement 14. This would secure decommissioning of the cable protection and allow the SoS to consider the implications of the project as a whole in deciding if there is an AEoI, as the DMLs do not take the whole project into account.

6.6.356. If the SoS should not agree to this, then the ExA advises that both Condition 3(1)(g) and Condition 20 should be included in Schedules 11 and 12 of the the DMLs of the rDCO, as Condition 3(1)(g) on its own does not secure decommissioning of cable protection.

Conclusions on the effect from introduction of new substrate during operation – cable protection

6.6.357. No party disputed the Applicant's conclusion that the area of sandbank feature affected by introducing new substrate would represent such a small area of the SAC that its conservation objectives would not be undermined.

6.6.358. As noted above, there is disagreement between the Applicant and NE regarding colonisation of rock protection by *S. spinulosa*. NE's position is that colonisation of substrate by reef does not count as a proper reef feature and that the addition of any hard substrata is often incompatible with the conservation objectives for the SAC and could result in lasting change.

6.6.359. The ExA accepts NE's advice that the artificial substrate would not improve conditions but does consider that *S. spinulosa* provide spawning stock for reef on nearby natural substrates. However, on balancing all of the evidence the ExA concludes, as does NE, that it is unable to advise, beyond all reasonable scientific doubt, no AEoI.

Conclusions on the effect of increased suspended sediment and smothering – sandbank feature

6.6.360. Both the Applicant and NE agree that AEoI of the SAC from the effect on this feature can be excluded. The ExA has no reason to dispute this.

Conclusions on the effect of increased suspended sediment and smothering – reef

6.6.361. During the Examination, the Applicant proposed additional commitments to provide comfort to the MMO and NE that AEoI could be excluded for the effects of increased suspended sediment and smothering of reef features. These commitments have been secured in the SIP and CSIMP and both IPs are now content. The ExA is also, therefore, in agreement of no AEoI for this feature.

Conclusions on the appropriateness of the SIP/CSIMP

- 6.6.362. The debate during the Examination about the preferred mechanism for delivering potential mitigation measures and to aim for the avoidance of AEoI of the designated features of the HHW SAC revolved around the appropriateness of using a SIP. Both the MMO and NE considered that it would not be appropriate to use in circumstances where a worst case scenario can be identified and assessed at the pre-application stage. The MMO was also concerned that the SIP would result in extra regulatory governance near to activity commencing and that it may have to issue a stop notice if the SIP conditions were not met. NE agree that this represented a change since its advice to the Norfolk Vanguard OWF Examination but advised this was because of legal advice it had subsequently received.
- 6.6.363. To resolve this issue, the Applicant proposed the use of Cable Specification Installation and Monitoring Plan (CSIMP) which would secure the mitigation but not require the use of a Grampian condition and would not require any further consideration of AEoI by the MMO. Of the two proposed conditions, all parties would prefer the use of the CSIMP condition. However, this preference should not be considered an indication that the CSIMP would avoid the MMO having to consider AEoI at the stage that the condition is discharged.
- 6.6.364. Both IPs made a distinction between the use of the SIP for this SAC compared with the use of a SIP for the SNS SAC. The Applicant's assessment for the SNS SAC provided sufficient evidence that the only significant risk came from the combined effects of piling at different OWFs. The degree of uncertainty that appropriate mitigation can be delivered is much less than it is in the case of the HHW SAC SIP.
- 6.6.365. The ExA agrees with all parties that for the HHW SAC, the adoption of the CSIMP appears the most appropriate approach. It considers that a SIP would not be appropriate to use in circumstances where a worst case scenario can be identified and assessed at the pre-application stage, as is the case for the HHW SAC. The degree of uncertainty that appropriate mitigation can be delivered is much greater than it is in the case of the South North Sea SAC, where the ExA is content to accept the SIP.
- 6.6.366. The ExA does caution that the adoption of the CSIMP, if the SoS was to give consent, is the preferred mechanism and does not suggest that a conclusion of no AEoI can be given. The MMO may need to consider AEoI at the stage that the condition is discharged.

Overall conclusions

- 6.6.367. The ExA has considered the conservation objectives of the HHW SAC most likely to be affected by the Proposed Development (alone or in combination with Norfolk Vanguard OWF) and conclude that it has concerns relating to the maintenance and restoration of the qualifying features and the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely. As concluded above,

the ExA cannot advise no AEoI for the HHW SAC, alone or in combination with other plans or projects from;

- a. the effects of temporary physical disturbance on the sandbank and reef features;
- b. the effect of permanent habitat loss from cable protection on both features; and
- c. the effect from introduction of new substrate during operation on both features.

Marine mammals

- 6.6.368. The Applicant's assessments for all the marine mammal SACs is based on what is stated to be a realistic worst case scenario, with the parameters listed in Table 8.8 of [APP-201]. These include the expected number of UXO which would require removal, the maximum number of piled foundations and maximum hammer energies used in piling.
- 6.6.369. The potential effects considered by the Applicant in relation to marine mammals can be broadly described as:
- a. injury or disturbance from increases in underwater noise from piling, UXO clearance and vessel movements;
 - b. increased collisions with vessels;
 - c. changes to the availability of prey as a result of habitat loss, increases in underwater noise and changes in water quality;
 - d. changes in water quality; and
 - e. disturbance at haul-out sites (for seal species only).
- 6.6.370. The Applicant initially identified the following mitigation for marine mammals in [APP-201]. Refer to the section dealing with the SNS SAC for further information on how delivery of these measures would be secured:
- a. Use of a soft-start and ramp-up protocol so that each piling event would begin with soft-start for a minimum of 10 minutes at 10% of the maximum hammer energy, followed by a gradual ramp-up for at least 20 minutes to the maximum hammer energy. This would allow marine mammals to move away from the area before the maximum hammer energy was reached.
 - b. A Marine Mammal Mitigation Protocol for Piling (MMMP) to be developed in the pre-construction period in consultation with the relevant SNCBs and the MMO which would provide details of the measures to be employed to reduce the risk of permanent auditory injury (including the soft start procedure described above).
 - c. A Marine Mammal Mitigation Plan for UXO clearance – the dDCO does not actually seek powers to undertaken UXO clearance as this would be subject of a separate Marine Licence. However, the Applicant has included an assessment of the anticipated effects of UXO clearance and the relevant mitigation in [APP-201].

- 6.6.371. The Applicant has also relied on the OPEMP [REP5-035] to deliver the mitigation measures required to control any accidental release of pollutants during construction.

Humber Estuary SAC

- 6.6.372. The SAC is located at some distance from the Proposed Development array (175km) and the offshore cable route (112km). However, the movements of grey seal along the east coast of England, as described in [APP-201], could lead to the SAC population being adversely affected.
- 6.6.373. The Applicant's approach to assessing disturbance was to identify the offshore likely to be affected by underwater noise associated with the Proposed Development then to estimate the likely numbers of grey seals which could be affected as a percentage of a reference population. As the grey seal population is likely to exploit wide areas of the North Sea, the assessment has considered different reference population sizes. For the effects from the Proposed Development alone the reference population is the SAC population and the population associated with the south east England management unit (MU). For the in-combination assessment, the reference population is the combined populations of the south east England, north east England and east coast Scotland MUs and the Wadden Sea region [APP-201].
- 6.6.374. The following levels of disturbance were estimated in [APP-201]:

Source of underwater noise disturbance	No. grey seals disturbed	% SAC population	% reference population
UXO detonation (assessment assumes one detonation in cable corridor at same time as piling in OWF area)	2 in OWF area 170 in offshore cable corridor	4.3%	2.8%
Piling only (assumed to be taking place in cable corridor and interconnector search area at same time)	2 in OWF area 26 in offshore cable corridor	1.0%	0.6%
Disturbance during construction from sources other	1 in OWF area 36 seal in offshore cable corridor	0.9%	0.6%

Source of underwater noise disturbance	No. grey seals disturbed	% SAC population	% reference population
than piling or UXO clearance*			
Disturbance during operation eg from operational turbines, maintenance activities & changes prey availability*	1 in OWF area 36 seal in offshore cable corridor	0.9%	0.6%
Disturbance during decommissioning*	1 in OWF area 36 seal in offshore cable corridor	0.9%	0.6%

* assumes all grey seals present within offshore project area are disturbed

- 6.6.375. The Applicant concluded that given the conservative nature of the assessment and the known movements of tagged seals, the level of disturbance would not undermine the delivery of the conservation objectives and therefore would not lead to an AEoI of the SAC from the Proposed Development alone. [APP-201].
- 6.6.376. The assessment of in-combination disturbance effects is presented in Table 8.63 of [APP-201]. It estimates the area of sea likely to experience increased underwater noise and the number of the grey seal that would be affected due to:
- one piling event at all UK and European OWF including the Proposed Development;
 - up to two UXO clearances;
 - up to two seismic surveys;
 - UK and European OWF construction activities other than piling; and
 - operation and maintenance of UK and European OWFs.
- 6.6.377. When all effects are summed together the total number of grey seals that would be disturbed would be 6.6% of the relevant reference population and 37% of the SAC population. Effects from operation and decommissioning are predicted to be less than those from construction. The Applicant concludes that it is highly unlikely that the seals affected would all be from the SAC population. In addition, the distance between the OWF and the coast makes it unlikely that grey seal would be

displaced from foraging areas or haul-out sites to the extent that the integrity of the SAC would be affected [APP-201].

- 6.6.378. The Applicant's assessment also considers the potential for disturbing seals using haul-out sites which could lead to adverse effects on pupping and moulting groups of seals. However, it states that based on published evidence, seals are unlikely to be affected by sources of disturbance if it is over 300m away. As the vessels associated with all phases of the Proposed Development are expected to use existing shipping routes they would not be within 300m of seal haul-out sites on the coast [APP-201].
- 6.6.379. Adverse effects on the SAC grey seal population from vessel collisions were excluded by the Applicant because the expected increase in vessel movements (1,180 movements) during construction would be very small compared with existing vessel activity in the area. [APP-201]. The assessment also states that grey seals would be able to detect the presence of vessels and avoid them. In-combination effects are stated to be highly unlikely to occur.
- 6.6.380. The Applicant identified potential effects on prey availability during construction from increases in underwater noise assessment and decreases in water quality. Based on the underwater noise reported in the ES [APP-238], the Applicant has calculated the area of sea where fish would be subject to physical disturbance and/or temporary loss of habitat within the OWF are, the offshore cable corridor and the project interconnector area. This is estimated to be a total of 23.31km².
- 6.6.381. The potential increase in suspended sediment and re-deposition, based on the parameters in [APP-201, Table 8.8], is predicted to be 0.054km³ with only a small proportion of sand and mud staying in suspension long enough to form a plume. The Applicant noted that it is unlikely that any changes in prey resource would occur right across the offshore project area and is more likely to be focussed around working sites. The total area of construction works would also be less since the area used in the assessment includes both the interconnector cable and the project interconnector cable. In practice, only one of those would be built, depending on whether the Norfolk Vanguard OWF is constructed [APP-201].
- 6.6.382. During operation, the total habitat loss for fish species resulting from the introduction of hard substrate, operational noise and EMF is predicted by the Applicant to be up to 11.75km². The Applicant cites studies at operational OWFs which indicate that any increase above background noise levels during operation would be small and localised and so would not have significant effects on fish populations. EMFs would also be expected to decrease rapidly with distance from any source [APP-201].
- 6.6.383. The number of grey seals affected by changes in prey resource is estimated by the Applicant to be 0.9% of the SAC population. This is based on the assumption that all the grey seal within the offshore project area could be affected. The Applicant notes that it is unlikely that any

changes to prey resource would occur right across the whole offshore project area during construction or operation [APP-201].

- 6.6.384. In-combination effects from changes to prey resource were excluded by the Applicant on the grounds that there would be no additional effects to those assessed for the disturbance of foraging seals as the areas and duration of any potential changes in prey resources would be within those assessed for underwater noise disturbance.
- 6.6.385. NE initially raised concerns about the predicted in-combination disturbance of 37% of the grey seal SAC population [RR-099]. The Applicant provided an additional submission which reiterated its original position that not all the seals affected would come from the SAC population. It pointed out that the measures proposed to reduce disturbance to harbour porpoise would also benefit the grey seal population [AS-024]. NE subsequently agreed with the Applicant that it was unlikely that all the grey seals subject to disturbance would come from the SAC population [REP16-10].
- 6.6.386. Given the conservative nature of the Applicant's assessment and NE's final position, the ExA concludes that the AEoI of the SAC would not arise as a result of the Proposed Development either alone or in combination with other plans or projects.

The Wash and North Norfolk Coast SAC

- 6.6.387. The location of this SAC is also distant from the offshore boundaries of the Proposed Development. [APP-201] states that the nearest points of the Proposed Development would be 110km from the OWF site and 34km from the offshore cable corridor. However, the Applicant identified likely significant effects on the harbour seal feature because of the known movements of harbour seal along the east coast. The Applicant's assessment used the same methods as those used to assess the effects of disturbance from underwater noise in the Humber Estuary SAC assessment.
- 6.6.388. The reference populations used in the assessment of the effects of the Proposed Development alone were the harbour seal population of the south-east England MU. For the in-combination assessment the reference population used is that of the south-east England MU and the Waddenzee MU.
- 6.6.389. The following levels of disturbance on seals foraging at sea were estimated in [APP-201]:

Source of underwater noise	No. of harbour seals disturbed	% SAC population	% reference population
UXO detonation (assessment)	0.2 in OWF area	1.3%	0.8%

Source of underwater noise	No. of harbour seals disturbed	% SAC population	% reference population
assumes one detonation in cable corridor at same time as piling in OWF area)	42.5 in cable corridor area		
Single pile installation plus disturbance in the interconnector search area and cable corridor	0.2 in OWF 9 in offshore cable corridor area	0.3%	0.2%
Disturbance during construction from sources other than piling or UXO clearance*	0.07 in OWF area 9 in offshore cable corridor area	0.3%	0.2%
Disturbance during operation eg from operational turbines, maintenance activities & changes prey availability*	No figures given in [APP-201]	0.3%	0.6%
Disturbance during decommissioning*	No figures given in [APP-201]	0.3%	0.6%

- 6.6.390. The Applicant concluded that, given the small numbers of animals likely to be affected and the known movements of harbour seal along the east coast, the level of disturbance would not undermine the delivery of the conservation objectives and therefore would not lead to an adverse effect on the integrity of the SAC from the Proposed Development alone. [APP-201].
- 6.6.391. The in-combination assessment undertaken by the Applicant is presented in Table 8.59 of [APP-201]. When all effects are summed together the predicted total number of harbour seals that would be disturbed is 257.

This is 0.6% of the relevant reference population and 7.6% of the SAC population. Effects from operation and decommissioning were predicted to be less than those from construction [APP-201].

- 6.6.392. The Applicant concluded that as it is highly unlikely that all the seals affected would all be from the SAC population and given the distance between the OWF and the coast, it is unlikely that harbour seal would be displaced from foraging areas or haul-out sites to such an extent that the integrity of the SAC would be affected [APP-201].
- 6.6.393. The Applicant excluded AEoI from disturbance at seal haul-out sites, vessel collision risk and changes to the availability of prey on the basis of similar evidence and reasoning as for the grey seal feature of the Humber Estuary SAC.
- 6.6.394. None of the IPs raised any concerns about the Applicant's conclusions in the course of the Examination. The ExA is satisfied that AEoI of the SAC would not arise from the Proposed Development, either alone or in-combination with other plans or projects.

Southern North Sea SAC

- 6.6.395. The SNS SAC consists of two 'seasonal components' – the northern part of the SAC is mainly used by harbour porpoise in the summer months while the southern part of the SAC is mainly used in the winter. The OWF element of the Proposed Development is located in the summer use part of the SAC. The conservation objectives for the site, as described by the Applicant [APP-201] relate directly to potential impacts from the Proposed Development. In summary the objectives are:
- a. The species is a viable component of the site – this is stated by the Applicant to be when the species is able to live successfully within it and designed to deal with factors which could restrict harbour porpoise survival and/or reproduction.
 - b. There is no significant disturbance of the species – the Applicant has based its determination of 'significant' on draft advice from the SNCBs. This defines a significant effect as one where harbour porpoise are excluded from more than 20% of the area of one of the seasonal components of the SAC in any given day and an average of 10% of the relevant area of the site over a season.
 - c. The condition of supporting habitats and processes, and the availability of their prey is maintained.
- 6.6.396. The reference population used in the Applicant's assessment is the North Sea MU population rather than the SAC population. The reason given by the Applicant is that the JNCC Site Selection Report states that the SAC population estimate is based on a one-month survey in 2015 and it should not be relied on as an estimated population for the site. Use of the MU population takes into account daily and seasonal movements of the harbour porpoise within the southern North Sea [APP-201].

Injury or disturbance from increases in underwater noise from piling

- 6.6.397. The Applicant's assessment of disturbance as a result of increased underwater noise assumes that effects could occur up to 26km from an individual piling or UXO detonation and up to 10km from seismic operations. The area of the SAC affected was considered in relation to the area of the seasonal components rather than the whole SAC. The population size is based on an estimation of the UK North Sea MU area, the overall harbour porpoise density from the most recent published survey and the estimated UK North Sea MU population. It was estimated, based on the discussions held during the evidence plan process with the SNCBs and other stakeholders that the SAC could support 17.5% of the North Sea MU reference population.
- 6.6.398. In relation to the risk of permanent auditory injury, several sources of underwater noise were considered in the Applicant's assessment. UXO clearance was estimated to affect 690.5 harbour porpoise without mitigation. The maximum predicted impact ranges and areas from various other sources without mitigation are presented by the Applicant in the following tables in [APP-201]:
- a. Table 8.16 - piling would affect 0.2. -0.4 individuals;
 - b. Table 8.24 – construction activities other than piling – 0.7 individuals (based on modelling of noise from rock placement which is stated to represent the greatest impact); and
 - c. Para 877 – vessel noise would affect 0.03 individuals.
- 6.6.399. The Applicant concluded that implementation of the MMMP would be sufficient to avoid permanent auditory injury on harbour porpoise and the Proposed Development alone would not lead to AEoI of the SAC. Underwater noise generated by other construction activities and vessel movements were not predicted to lead to permanent injury. The Applicant concluded that the commitment to deliver MMMPs for piling and UXO clearance would also prevent the Proposed Development contributing to any increased in-combination risk of auditory injury.
- 6.6.400. In relation to disturbance of harbour porpoise as a result of increased underwater noise the Applicant presented estimates of the area of the SAC seasonal components and the % of the North Sea MU population for various different noise sources:
- a. UXO clearance [APP-201 Tables 8.12 to 8.14];
 - b. one piling event for one and two phase construction using pin piles [APP-201 Tables 8.17 to 8.19];
 - c. two concurrent piling events in the Proposed Development OWF site for one and two phase construction [APP-201 Tables 8.21 to 8.23];
 - d. construction activities other than piling [APP-201 Tables 8.25 to 8.26]; and
 - e. underwater noise from vessel movements [APP-201 Table 8.27];
 - f. concurrent UXO clearance and piling at the Proposed Development [APP-201 Tables 8.29 to 8.31]; and
 - g. one piling event at the Proposed Development site plus, other construction activities and vessel movements [APP-201 Tables 8.32 to 8.34].

- 6.6.401. None of the estimated areas affected by increased underwater noise would exceed 20% of the seasonal component areas on any given day or 10% of the seasonal component area on average. Expressed as a percentage of the North Sea MU the numbers of individuals disturbed would be:
- a. UXO clearance would disturb 0.55 – 0.65% of the population;
 - b. a single piling event would disturb 0.55 – 0.65%;
 - c. two concurrent piling events would disturb 1.1 – 1.3%;
 - d. construction activities other than piling would disturb 0.3%;
 - e. vessel noise would disturb 0.36%;
 - f. concurrent UXO clearance and piling at the Proposed Development would disturb 1.3%; and
 - g. one piling event, other construction activities and vessel movements would disturb 0.7 – 0.8%
- 6.6.402. With regard to effects from operation and maintenance, the Applicant cited published research papers which show no more than a slight reduction in harbour porpoise use of operational OWF sites. However, it estimated the areas of the seasonal components of the SAC which would be affected if all individuals using those areas were displaced by noise from operational turbines, underwater maintenance activities and maintenance vessels. None of the areas affected exceeded 20% of the area of either seasonal components on any given day or 10% of the area across a season.
- 6.6.403. The Applicant's assessment of decommissioning effects assumes that the effects would be similar to those from construction but of lesser magnitude as they would not involve piling noise.
- 6.6.404. The Applicant concluded that as its assessment was based on worst case scenarios that are not actually expected to occur and still predicts that the area of the seasonal components of the SAC affected would not exceed the targets of 20% on any given day or the 10% average over the duration of a season, the Proposed Development alone would not lead to AEOI of the SAC.
- 6.6.405. The Applicant's in-combination assessment [Section 8.3.1.5.3 of APP-201] was undertaken based on the potential worst-case scenario of four other OWF developments (Dogger Bank Creyke Beck A OWF, Dogger Bank Teesside A OWF, Hornsea Project Three OWF and East Anglia ONE North OWF) piling at the same time as the Proposed Development. The assessment assumes that there would not be any overlap in piling activities between the OWFs apart from for the Dogger Bank OWF projects, where it is assumed that piling would occur on two of the OWFs at the same time.
- 6.6.406. The assessment also assumes that piling could occur at any time during the construction period of the Proposed Development although it is stated that piling would only be expected to occur for 4% of the total construction period (up to 54 days) [APP-201].

6.6.407. The Applicant has estimated the maximum, minimum and average areas of the SAC that would be affected by piling events (referred to as “*overlap*” with the SAC) for single and concurrent piling events on any given day (Table 8.40 of [APP-201]) and the average area that would be affected over a season. The seasons are defined as:

- a. summer – 1 April – 30 September; and
- b. winter - 1 October – 31 March.

6.6.408. Lost working piling time due to poor weather conditions was assumed to be at least 5% for the summer season and 15% for the winter season. Piling was therefore assumed to occur on 173 days in the summer season and 154 days in the winter season. The extent of the seasonal components of the SAC which would be affected by increased underwater noise are summarised below:

Scenario	Minimum overlap with SAC	Maximum overlap with SAC	Average overlap with SAC
Single piling at all 5 OWF	9.2% of summer use SAC area 16.7% of winter use SAC area	20.1% of summer use SAC area 18.9% of winter use SAC area	13.4% of summer use SAC area 17.8% of winter use SAC area
Concurrent piling at all 5 OWF	9.6% of summer use SAC area 17.0% of winter SAC area	28% of summer use SAC area 25.6% of winter use area	18.8% of summer use area 22.0% of winter use area
Single piling at all 5 OWF – seasonal averages	-	-	13.81% of summer use area 15.1% of winter use area
Concurrent piling at all 5 OWF	-	-	17.8% of summer use area

Scenario	Minimum overlap with SAC	Maximum overlap with SAC	Average overlap with SAC
			18.6% of winter use area

- 6.6.409. The assessment predicted that approximately 2.5 – 5.1% of the North Sea MU population could be disturbed by the in-combination effects of piling [APP-201].
- 6.6.410. In addition to the mitigation described above, the Applicant proposed a SIP for the SAC, based on the In-Principle SIP [APP-708]. The SIP would set out the approach to deliver mitigation measures for the harbour porpoise SAC population and could be adapted when specific management measures are developed by the SNCBs [APP-201]. The SIP describes broad classes of measures which could deliver mitigation but notes that final measures would be finalised between the granting of the DCO and the beginning of piling in agreement with the MMO and the SNCBs. The types of measures would be:
- noise mitigation systems to reduce piling noise at source;
 - scheduling piling to reduce overlap with other OWF and hence reduce the area over which disturbance would arise;
 - use of alternative foundation methodologies within the consented project envelope which would if possible, avoid pile driving; and
 - any other potential measures which may emerge before construction begins.
- 6.6.411. The Applicant concluded that, given the conservative nature of its assessment, the SIP would be sufficient to avoid any adverse in-combination effects on the integrity of the SAC.
- 6.6.412. The Applicant concluded that it was unlikely that there would be in-combination effects on underwater noise levels from tidal and wave marine renewables developments, aggregate extraction and dredging, offshore mining, oil and gas projects (other than seismic surveying), licensed disposal sites, navigation and carbon capture projects. However, there was potential for UXO clearance, seismic surveys and OWF construction other than piling to lead to in-combination effects during piling [APP-202].
- 6.6.413. As the potential number of UXO clearance events are unknown the Applicant assessed several different scenarios. The worst case scenario was defined as two UXO detonations at any one time, with either both in the winter use area, both in the summer area or one in each area. The assessment predicted that for any single occasion less than 20% of the area of the SAC seasonal components would be disturbed unless two

detonations occurred in the winter use area. In that case, 33.5% of the winter SAC area would be affected [APP-201].

- 6.6.414. In order to calculate the average area that would be affected across each season, the Applicant defined a worst case scenario where there would be up to 40 potential UXO at each site with one detonation per day. The seasonal averages were calculated by multiplying the average of the minimum and maximum effect on any one day by the proportion of days within the season on which piling could occur. The estimated seasonal average area subject to disturbance would be less than 10% unless two detonations occurred within the winter use area which would lead to 14.7% of the area being affected [APP-201].
- 6.6.415. To calculate the number of animals which would be disturbed by UXO detonation the Applicant defined a worst case scenario which assumed up to four detonations across the whole of the North Sea. This could lead to 1.3% of the North Sea MU population being displaced [APP-201].
- 6.6.416. A similar approach was used to assess effects from seismic surveys, with a worst case scenario of up to two seismic surveys in either the summer or winter use SAC area. The areas disturbed on any one day would be less than 20% of the seasonal SAC component on any given day. The average area disturbed across a season would be less than 10%; 0.05% of the North Sea MU population would be disturbed.
- 6.6.417. The Applicant also assessed the in-combination effects from construction noise (other than piling) with other OWFs, and noise generated by other OWFs which would be newly operational at the point that the Proposed Development construction began. None of the assessments predicted that more than 20% of the area of the SAC seasonal components would be disturbed at any one time or that the seasonal average area of disturbance would exceed 10%.
- 6.6.418. Table 8.53 of [APP-201] presents the seasonal average areas that would be disturbed by the combined effects for each seasonal component with and without UXO clearance and seismic surveys. If UXO clearance and seismic surveys are excluded, then 24.2% of the summer use SAC area and 20.7% of the winter use area would be subject to underwater noise disturbance. When UXO clearance and seismic surveys are included the extent of the area disturbed rises to 26% (summer use area) and 24.5% (winter use area). When the maximum areas of disturbance are considered, this is stated to affect 34.1% of the summer use area and 43.4% of the winter use area [para 1113, APP-201].
- 6.6.419. The Applicant concluded that there would be no AEoI of the SAC for two reasons. The first is that its assessments were based on worst case scenarios which were unlikely to all arise – for instance it is unlikely that all the OWFs considered in the piling assessment would actually be piling at the same time or that there would be no overlap between the areas disturbed by separate noise sources. The second reason is that the SIP provides a mechanism which would allow the Applicant to develop

appropriate measures which would reduce underwater noise disturbance to an acceptable level.

- 6.6.420. TWT [RR-040], [AS-031] and [REP2-057] and the Whale and Dolphin Conservation (WDC) [REP2-048] disputed the Applicant's approach to assessing the effects of underwater noise. Their key concerns were:
- a. They do not agree with the relevant SCNB guidance on assessing underwater noise disturbance to marine mammals [RR-040], [AS-031], [REP2-048], [REP2-057], [REP6-040], [REP9-029] and [REP9-030].
 - b. The Applicant's assessment should have used the North Sea MU reference population rather than the SAC population [AS-031], [REP2-048], [REP2-057], [REP2-112], [REP6-040] and [REP9-030].
 - c. While the SIP could be an appropriate mechanism for delivering mitigation, it does not include sufficient detail to give confidence that mitigation would be effective or to support a conclusion of no AEoI of the SAC [RR-040], [REP2-048], [REP2-057], [REP6-040], [REP9-029] and [REP9-030].
 - d. There is no regulatory mechanism to manage in-combination underwater noise impact [RR-040], [REP2-057], [REP6-040] and [REP9-030].
 - e. While UXO clearance would be done under a separate licence rather than the dDCO, the dDCO should include requirements/conditions analogous to those included to manage piling impacts and a draft UXO clearance MMMP should be provided by the Applicant. The SIP should make it explicit that is required to mitigate against impacts from both piling and UXO clearance [RR-040], [AS-031], [REP2-098] and [REP4-04].
 - f. The MMMP for piling is based on out of date guidance and unproven mitigation measures [AS-031], [REP2-048], [REP2-057], [REP2-112], [REP9-029] and [REP9-030].
 - g. The Applicant's assessment does not consider the impact of pile driving at two locations within the Proposed Development [REP2-112].
- 6.6.421. The Applicant stated that using the North Sea MU population rather than the SAC population had been agreed with NE during the Evidence Plan Process and was in line with the draft conservation objectives [AS-031], [REP2-048], [REP2-057], [REP6-040] and [REP9-030]. Its approach to assessment was based on guidance from the SNCBs [AS-024], [REP2-057], [REP2-048], [REP6-040], [REP9-029] and [REP9-030].
- 6.6.422. While broadly in agreement with the Applicant's approach to modelling underwater noise, the MMO queried one aspect of the assessment [RR-069]. It subsequently agreed that there was no need for the Applicant to undertake further noise modelling [REP4-035]. No concerns about the Applicant's approach to assessment were raised by NE.
- 6.6.423. WDC cited several studies which demonstrated that harbour porpoise leave OWF areas during construction and only return in limited numbers; as the SAC is a key foraging area for the species, exclusion from this

area could have a significant impact on the harbour porpoise population [REP2-112]. The Applicant disputed WDC's interpretation of these papers [AS-024].

- 6.6.424. WDC also advised that given the potential risk to the harbour porpoise population from noise generated by piling, foundations requiring piling should not be used [RR-065]. If piled foundations were to be used, then strict limits should be placed on noise levels during construction. Work should be halted when marine mammals approach the Proposed Development [REP2-112] and [REP9-030]. Only measures whose effectiveness is already known should be relied on for mitigation and noise/visual monitoring should be undertaken throughout construction [REP2-112].
- 6.6.425. NE was content that the Proposed Development alone would not lead to AEoI of the SAC [REP6-033]. It agreed that the implementation of the SIP would be an appropriate way of mitigating in-combination effects. However, NE was concerned that as more OWFs come forward, even with a project-specific SIP in place, the 20% and 10% area disturbance thresholds would not be met. A regulatory mechanism is required to ensure that this does not happen before a conclusion of no AEoI of the SAC could be reached [RR-099]. NE maintained this position throughout the Examination [RR-099], [AS-028], [REP4-043], [REP6-033], [REP7-050], [REP10-038], [REP13-038], [REP14-065], [REP16-010] and [REP16-024].
- 6.6.426. The Applicant maintained its position that the commitment to the SIP would ensure that adequate mitigation would be in place to prevent harm occurring. Developing the SIP pre-construction would ensure that it is based on the latest scientific evidence and requirements [AS-031], [REP-048], [REP2-057], [REP6-040], [REP9-029] and [REP9-030]. The piling MMMP is based on the current SNCB guidance for managing piling impacts; finalising it during construction would allow it to be informed by the latest evidence around mitigation [REP2-048]. The MMO supported the Applicant's approach [AS-027] and [REP16-009].
- 6.6.427. The Applicant agreed that a regulatory mechanism is required [REP4-014] but in its view the responsibility to manage cumulative effects lies with the MMO as the appropriate regulator [AS-024], [AS-031], [REP1-042], [REP2-057] and [REP9-029]. The approach of relying on a SIP was accepted by the SoS for the East Anglia THREE OWF and in the draft Review of Consents for the SAC [REP1-042].
- 6.6.428. The Applicant also maintained its position that as UXO clearance would be subject to a separate licence, an MMMP should not be included in the dDCO [AS-024], [AS-031], [REP1-042], [REP2-057], [REP6-040] and [REP9-030]. The MMO agreed with this approach [AS-027] and [REP16-009].
- 6.6.429. The MMO agreed that realistic information on construction activities in the North Sea would only be available near the time of the proposed activities so a SIP is an appropriate control mechanism [RR-069], [AS-

027], [REP1-058], [REP3-016] and [REP16-009]. It is content to rely on a SIP in this case (in contrast to their position on the HHW SAC) as it allows it, as the regulator, to gain a full view of the potential in-combination impacts at the post-consent stage once the information on construction programmes would be available [REP13-035].

- 6.6.430. The MMO explained that it is part of a SNS SAC underwater noise regulator group which is developing a management tool for noise activity within the SAC. All regulators would input data into the tool with timetables and spatial impacts of noise generating activities in the SAC which would be publicly available to inform Habitats Regulations Assessments [REP3-016], [REP4-035], [REP6-045] and [REP7-040].
- 6.6.431. The MMO advised at D10 that development of the tool had been delayed by issues around Covid-19. However, it suggested that there is an existing manual mechanism which is managed by the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) [REP10-060]. NE did not agree that OPRED provided a suitable mechanism as it is not a formal process [REP14-065].
- 6.6.432. The MMO provided further updates on the progress with the development of the management tool [REP16-022] and [REP18-36] and confirmed that it would be published on the OPRED website alongside the OPRED activity tracker. However, the noise management tool had not been delivered by the end of the Examination.
- 6.6.433. The MMO [RR-069], [AS-027] and [REP2-051] requested a condition to prevent concurrent piling between the Proposed Development and Norfolk Vanguard OWF. The Applicant [AS-024] considered it was not appropriate to have a condition in the DCO that relates to another project. Its assessment considered the effect of two concurrent piling events and concluded that there would be no adverse effect on the integrity of the SAC [APP-201]. In its view the SIP would ensure adequate mitigation and would require piling to be scheduled [AS-024, REP2-051].
- 6.6.434. Following a revision to the wording of the SIP, the MMO agreed that the SIP was the appropriate route for dealing with the potential effects from concurrent piling from Norfolk Vanguard OWF and the Proposed Development [REP6-029] and [REP8-021].
- 6.6.435. The Applicant's assessment [APP-201] assumed maximum hammer energies of 5,000kJ for monopile foundations and 2,700kJ for pin piles. Schedules 9 and 10 Condition 14(3) and Schedules 11 and 12 Condition 9(3) of the application version of the dDCO [APP-020] secured the maximum hammer energy for monopiles only; this was noted by both NE [AS-028] and the MMO [REP3-016]. At D4, the Applicant amended the dDCO to include maximum energies for pin piles [REP4-003] and [REP4-004]. These changes were carried through to the final version of the dDCO [REP18-009].

Vessel collisions

- 6.6.436. The Applicant estimated approximately 1,180 two-way vessel movements over the two to four year indicative offshore construction window, with an average of approximately two vessel movements per day. The maximum number of vessels on site at any one time would be 57 [APP-201]. [APP-201 Table 8.28] presents the estimated figures for the number of individuals at increased risk of collision during construction; 0.04% of the North Sea MU is predicted to be at a 5 – 10% increased collision risk.
- 6.6.437. The Applicant's assessment of decommissioning effects assumes that the effects would be similar to those from construction.
- 6.6.438. Indicative operational and maintenance vessel movements are estimated by the Applicant to be up to a total of 445 vessel movements per year, with an average of approximately 1-2 vessel movements per day. However, on a precautionary basis, the Applicant assessed a worst case scenario which assumes that the number of operation/maintenance vessel movements would be the same as the number during construction. The results of the assessment are therefore the same as those presented in Table 8.28 of [APP-201].
- 6.6.439. The Applicant expects that harbour porpoise would be able to detect the presence of vessels and, given that they are highly mobile, would be able to largely avoid vessel collision, therefore there would be no AEOI of the SAC [APP-201]. WDC do not agree that there is sufficient evidence to support this conclusion [REP2-112]. None of the other IPs raised concerns on this point.
- 6.6.440. In relation to in-combination effects from vessel movements, the projects included are listed in Table 8.54 of [APP-201]. Other projects have been excluded because the Applicant does not expect them to contribute significantly to vessel movements in the SAC area.
- 6.6.441. The Applicant has assumed that 95% of harbour porpoise would be able to avoid collisions. The number of individuals that could be affected during construction has therefore been calculated to be 5% of the animals present in each OWF area; this would be 0.07% of the North Sea MU population [APP-201].
- 6.6.442. The Applicant stated that the increase in vessel movements from operation/maintenance and decommissioning is expected to be much lower than the increase during construction [APP-201]. The Applicant concluded that there would be no AEOI of the SAC from the Proposed Development in combination with other plans and projects.

Effects on prey availability

- 6.6.443. The Applicant's assessment [APP-201] identified the potential indirect effects on fish species during construction as physical disturbance, loss or changes of habitat, increased suspended sediment concentrations, and increases in underwater noise. During operation and maintenance, potential effects on fish species could result from permanent loss of habitat; introduction of hard substrate; operational noise; and EMF.

Effects from decommissioning were assumed to be comparable to those of construction but of a lesser magnitude.

- 6.6.444. The Applicant [APP-201] concluded that any changes to prey availability resulting in the displacement of harbour porpoise would be substantially less than 20% of the area of either seasonal component of the SAC at any one time or 10% of the area of either seasonal component of the SNS SAC over the duration of that season. The total number of animals that could be affected by any decrease in prey availability is predicted to be 0.36% of the North Sea MU. The Applicant therefore concluded there would be no AEOI of the SAC as a result of the Proposed Development alone for any phase of the Proposed Development.
- 6.6.445. The Applicant's in-combination assessment of effects on prey availability concluded that they would be no greater than the effects of in-combination disturbance from underwater noise. This rests on the assumption that if prey were disturbed from an area, harbour porpoise would also be disturbed from a similar area. They would not be present to be affected by the decline in prey. The Applicant also stated that effects on prey species are likely to be intermittent, temporary and highly localised with a potential for future recovery. It concluded that there would no AEOI of the SAC from in-combination effects [APP-201].

Water quality

- 6.6.446. Changes to water quality from the disturbance of seabed sediments during construction were not predicted by the Applicant to be significant, based on the assessment in its ES. Measures to deal with any accidental release of pollutants during construction would be secured through the OPEMP [REP5-035]. However, the Applicant has assumed that under a worst case scenario all the animals estimated to be present within the offshore project area would be displaced. The Applicant's assessment of decommissioning effects assumes that the effects would be similar to those from construction.
- 6.6.447. As with the assessment of prey availability this would not exceed 20% of the seasonal component of the SNS SAC at any one time or 10% of the seasonal component of the SNS SAC over the duration of that season. The total number of animals that could be affected by any decrease in prey availability is predicted to be 0.36% of the North Sea MU. The Applicant therefore concluded there would be no AEOI of the SAC as a result of the Proposed Development alone. The Applicant's in-combination assessment did not include an assessment of in-combination effects on water quality [APP-201]; no concerns were raised about this by any of the IPs.
- 6.6.448. TWT raised concerns about how the effects of commercial fishing were included in the Applicant's assessment [RR-040], [AS-031] and [REP2-098]. The Applicant's assessment treated the effects from commercial fishing (including by-catch of harbour porpoises and reduction in prey availability) as part of the baseline as it is part of the existing activities affecting the SAC [APP-201].

- 6.6.449. In TWT's view [RR-040], fishing is a licensable ongoing activity that could affect the marine environment. It also stated that Defra policy requires existing and potential fishing operations to be managed in line with Article 6 of the Habitats Directive and that it had been assured that fishing would be included in future OWF assessments. The Applicant's position throughout the Examination was that fishing had occurred in the SAC for many years and there was no reason to expect fishing activity to increase beyond the current baseline. It also pointed out that the approach used in its assessment had been used in the Hornsea Project Three OWF Examination and the draft Review of Consents undertaken by BEIS [AS-024]. The National Federation of Fishermen's Organisations and VisNed [REP2-043] comments on cumulative impact assessment raised similar concerns about the inclusion of fishing activity in the baseline.
- 6.6.450. NE noted that while there were circumstances where it would be appropriate to consider fishing activity in the in-combination assessment, NE considered that the Applicant's assessment had adequately captured the effect on ongoing conservation activity for the purposes of undertaking HRA. It was not aware of any activities which would have significantly altered the level of fishing activity within the SAC or any proposals that were likely to do so in the future. It did however advise that fisheries managers could give more definitive advice [REP2-080].
- 6.6.451. While TWT's concerns are understandable, it appears to the ExA that there is no evidence before them to suggest an alteration in fishing activity within the SAC. In this particular case, the baseline data collected by the Applicant will have captured the effects of existing fishing activity. Including fishing activity in the in-combination assessment would introduce an element of double-counting to the assessment of effects which would not assist the SoS in determining if AEOI of the SAC would arise.

Conclusions

- 6.6.452. The ExA is satisfied that the Applicant has used the assessment methodology recommended by the SNCBs. The reasons given for using the North Sea MU reference population rather than the SAC are sound and the ExA notes that NE did not raise any concerns on this point during the Examination.
- 6.6.453. Mitigation for the effects of piling in relation to permanent auditory injury is secured through Condition 14 (f), Schedules 9,10 and 11 and Condition 9(f) of Schedule 12 of the dDCO [REP18-009]. These conditions/requirements commit the Applicant, in the event that piled foundations are used, to produce an MMMP in accordance with the draft MMMP. The final version of the MMMP submitted during Examination [REP5-033] and [REP5-034] is listed as a certified document in the dDCO [REP18-009].
- 6.6.454. Condition 19 of Schedules 9 and 10 and Condition 14 of Schedules 11 and 12 require noise monitoring to be undertaken if piling is proposed. These noise measurements must be provided to the MMO within six

weeks of the installation for the first four piled foundations. Condition 19(3) states that:

"If, in the opinion of the MMO in consultation with the relevant statutory nature conservation body, the assessment shows significantly different impacts to those assessed in the environmental statement or failures in mitigation, all piling activity must cease until an update to the marine mammal mitigation protocol and further monitoring requirements have been agreed".

- 6.6.455. It is noted that TWT and WDC do not agree that the measures proposed in the piling MMMP would be adequate to avoid the risk of permanent auditory injury. However, the proposed approach is in line with the approach recommended by the SNCBs; the wording of Condition 14(f)/Condition 9(f) allows the final MMMP to be revised in line with any changes recommended by the SNCBs. The ExA is content to rely on the advice provided by the Government's statutory advisors. In addition, Condition 19(3) provides an additional assurance that the MMMP can be revised in the event that the predicted underwater noise levels are found to be an underestimate.
- 6.6.456. TWT also advocates the inclusion of a requirement in the dDCO for an MMMP to cover the effects of UXO clearance. While UXO clearance is likely to be required in the construction of the Proposed Development, the Applicant has not sought powers to do so through the dDCO; instead it would seek a Marine Licence. The ExA notes that the MMO, the body which would issue these licences, agrees with the Applicant's approach.
- 6.6.457. The Marine Licence would also be subject to the provisions of the Habitats Regulations and so could only be granted if the proposed mitigation was adequate to avoid AEOI of the SAC. The ExA does not think it is necessary or appropriate to add a requirement for a UXO MMMP to the rDCO.
- 6.6.458. The Applicant's own assessment predicts that the combination of increased underwater noise from the Proposed Development and other OWFs could lead to a level of disturbance over the relevant thresholds. This could undermine the delivery of the SAC conservation objectives. The ExA notes that the Applicant's assessment has been based on various worst case scenarios which may not arise. The maximum number of turbines that would be constructed has also reduced during Examination. However, the possibility of in-combination AEOI of the SAC cannot be excluded on the basis of the evidence available to the ExA.
- 6.6.459. The Applicant is relying on developing a SIP post-consent which would deliver any mitigation or management measures necessary to avoid any in-combination effects. TWT and WDC do not feel that the SIP contains sufficient detail on mitigation for it to be relied on to reach a conclusion of no AEOI. However, it does not appear to the ExA that it is possible to undertake an accurate assessment of the likely in-combination effects associated with the construction of the Proposed Development until the details of construction, especially timing of any piling, are known. It

follows that it is not possible to determine exactly which mitigation measures would be required.

- 6.6.460. Condition 14(1)(m) of Schedules 9 and 10 and Condition 9(1)(l) of Schedules 11 and 12 of the dDCO [REP18-009] require the Applicant to submit a SIP to the MMO in the event that piled foundations are to be used:

"In the event that piled foundations are proposed to be used, at least six months prior to commencement of licensed activities, a site integrity plan which accords with the principles set out in the in principle Norfolk Boreas Southern North Sea Special Area of Conservation Site Integrity Plan and which the MMO is satisfied would provide such mitigation as is necessary to avoid adversely affecting the integrity (within the meaning of the 2017 Regulations) of a relevant site, to the extent that harbour porpoise are a protected feature of that site."

- 6.6.461. The activities licensed under the DMLs could not begin until the MMO has provided written approval for the SIP. This provides an additional point of control where construction can only begin if the Applicant can demonstrate that it would be able to provide adequate mitigation.
- 6.6.462. NE, WDC and TWT have expressed concerns about the lack of a mechanism to manage in-combination construction effects from OWFs in the North Sea. However, the ExA notes that the MMO which is the relevant regulator for marine activities, does not share these concerns. The ExA is content to rely on the advice from the MMO.
- 6.6.463. The ExA concludes that, subject to the implementation of the mitigation discussed above, no AEoI of the SAC would arise as a result of the Proposed Development alone or in combination with other plans or projects.

Onshore ecology

Paston Great Barn SAC

- 6.6.464. The Applicant undertook radio-tracking and transect-based surveys to establish the likely use of the onshore project area for foraging by females from the bat maternity roost. Based on the radio-tracking results, the Applicant concluded that the core foraging area for the colony was approximately 4km from the maternity roost in the SAC so it defined a 5km study area where effects on key habitats were considered. The HRA Report notes however that other sources of published information identify the likely foraging distance as being around 6km from the roost.
- 6.6.465. Habitat surveys, particularly hedgerow assessments were undertaken to evaluate the landscape features likely to be used by foraging bats. This led to the identification of five areas of particularly valuable habitats within the study area as shown on of [APP-201, Figure 9.5] and 17 hedgerows with moderate or high suitability for supporting commuting or foraging barbastelle bats [APP-201].

- 6.6.466. Under Scenario 2 [APP-201], sections of hedgerow would have to be removed to facilitate duct installation from 16 of the 17 hedgerows identified as having moderate or greater suitability to support roosting bats within the onshore project area. One hedgerow located at Witton Hall Planation would be crossed by HDD. The Applicant proposed the following measures to minimise the effects during construction:
- a. Reduction in the cable working width from 25m to 13m at these points.
 - b. Removal of the hedgerow in winter where possible to give bats time to adjust to the change before the maternity period begins.
 - c. Removal works would not commence after nights of poor weather (the definition of poor weather would be contained in the Outline Code of Construction Practice (OCoCP).
 - d. Removal of hedgerows as close to the beginning of works as possible to minimise the length of time the gap would be open.
 - e. Replanting the sections of hedgerow to provide replacement foraging and commuting habitats for bats the first winter after construction except the 6m gap required for the running track.
 - f. The 6m gap for the running track would be retained for a maximum of two years.
 - g. Replanting to follow guidance within the Norfolk Hedgerow Biodiversity Action Plan. Future hedgerow management to include allowing standard trees to develop where possible and ground flora planting designed to encourage insect biomass. Hedgerows would be double-planted with 2m grassland strips to ensure that a leeward side to forage is always available. Replanting would also include hedgerow improvement works such as gapping up and tree management where necessary.
 - h. With landowner agreement the hedgerows would be allowed to become overgrown within the onshore cable route width to provide better quality foraging and commuting habitat.
 - i. A Hedgerow Mitigation Plan would be developed in consultation with NE prior to the removal of the hedgerows which would provide the details of the reinstatement approach and the subsequent monitoring and maintenance of the planting.
 - j. Pre-construction habitat surveys of the hedgerows to confirm which hedgerows remain suitable for commuting and foraging.
 - k. Micro-siting of cables to avoid mature trees within hedgerows where possible.
- 6.6.467. The Applicant estimated that it would take three to seven years for the replacement sections of habitat to provide useful commuting and foraging habitats so the effects would be temporary. The area of hedgerow lost represents less than 0.05% of the available commuting/foraging hedgerow habitat within the barbastelle colony's core foraging area [APP-201].
- 6.6.468. The Applicant also considered the risk of hedgerow removal leading to fragmentation of bat commuting routes and the isolation of important habitat features within the core foraging zone. It concluded that there would be a temporary isolation of 11ha of habitat, which represents

0.6% of the available habitat within the study area [APP-201]. The Applicant concluded that the effects of hedgerow loss and fragmentation would not lead to AEOI of the SAC.

- 6.6.469. Under Scenario 1, hedgerow removal would have already taken place as part of the Norfolk Vanguard OWF. The main effect would be the retention of a 6m gap in 20% of hedgerows along the route to allow the Proposed Development to use part of the running track installed for Norfolk Vanguard OWF. The location of these has yet to be determined so the Applicant has assumed that they may be required at all the hedgerows scheduled to be removed by the Norfolk Vanguard project. The gaps would be retained for 16 weeks over two years and would then be replanted. The Applicant cited published evidence which supports the view that all UK bat species would be able to cross gaps of 10m or less. In the light of that and the temporary nature of the effect, the Applicant concludes that there would be no AEOI of the SAC [APP-201].
- 6.6.470. The Applicant excluded the possibility of AEOI of the SAC from indirect effects on ex-situ habitats for both scenarios on the following grounds:
- a. Excavations would be fully reinstated following the completion of construction following the best practice as set out in the OCoCP to minimise long term effect on local drainage patterns.
 - b. A pre-construction drainage plan would be developed to minimise water in the cable trench and ensure ongoing drainage of surrounding land.
 - c. Construction lighting would not be used at night except at the trenchless crossing locations, notably Dilham Canal and land east of Dilham Canal. Any lighting would be directional to minimise light spill.
- 6.6.471. AEOI of the SAC during operation are excluded on the grounds that the hedgerow replanting would provide improved commuting and foraging habitats. All earthworks would have been reinstated once duct installation has been completed and there would be no lighting required during operation so there would be no indirect effects on SAC integrity [APP-201].
- 6.6.472. AEOI of the SAC during decommissioning are excluded by the Applicant as it is assumed that cable ducts would be left in situ. The decommissioning methodology would be finalised when the Proposed Development approached the end of its life and would be agreed with the relevant authorities and statutory consultees [APP-201].
- 6.6.473. [APP-201] identified three projects which could lead to effects on the SAC in combination with the Proposed Development. These were the Norfolk Vanguard OWF, the Bacton Gas Terminal coastal protection and the Bacton Coastal Protection Scheme. All in-combination effects from the two Bacton schemes have been excluded as the construction periods would not overlap with those of the Proposed Development.
- 6.6.474. In-combination effects with Norfolk Vanguard OWF would only arise under Scenario 1 (in Scenario 2 Norfolk Vanguard OWF would not be

constructed). The combined effect of Norfolk Vanguard OWF and Scenario 1 of the Proposed Development would be to extend the length of time that a 6m gap was present in the affected hedgerows. The Applicant concludes that since all UK bat species are thought to be able to cross gaps of more than 10m, the combined effects would not lead to adverse effects on the SAC [APP-201].

- 6.6.475. The Applicant concludes that as the indirect effects on hydrology and from lighting from Scenario 1 would be negligible, no in-combination effects would arise that would lead to AEoI of the SAC [APP-201].
- 6.6.476. NE advised in its Relevant Representation [RR-099] that it did not agree with the Applicant's conclusion of no AEoI of the SAC. It did not agree that the consideration of indirect effects was adequate, given that the onshore cable route would pass through a number of important foraging areas for the barbastelle bats. NE requested that a mitigation plan should be drawn up between themselves and the Applicant; no such plan was provided in the application documents. NE advised that the plan should be in place for seven years or until the hedgerow has recovered fully. Temporary planting or some form of barrier should be put in place to fill the gap to maintain the hedgerow link. It also requested a commitment to monitoring to establish that the hedgerows identified as being of medium to high importance are restored to the same or higher quality.
- 6.6.477. The Applicant provided a clarification note which identified core commuting and foraging areas [AS-025]. It also updated section 12.2.3 of the OLEMS [REP1-021] to include wording which addressed NE's concerns. NE confirmed it was satisfied with the proposed mitigation and post-construction monitoring [REP2-080]. In its view, AEoI of the SAC are unlikely provided the hedgerow mitigation in the OLEMS and the Hedgerow Mitigation Plan can be implemented [REP7-050].
- 6.6.478. The final version of the OLEMS submitted at D14 [REP14-020] and [REP14-021] includes the original mitigation measures proposed by the Applicant and the amendments provided to address NE's concerns. It also includes the additional wording inserted at D1. This version of the OLEMS is listed as a certified document in the dDCO submitted at D18 [REP18-009].
- 6.6.479. Requirement 24 of the dDCO [REP18-009] prevents the commencement of any stage of the onshore transmission works before a written ecological management plan has been approved by the relevant planning authority in consultation with the relevant statutory nature conservation body. The plan must accord with the OLEMS as appropriate for the relevant stage.
- 6.6.480. The ExA is satisfied that all necessary mitigation has been adequately secured. In view of the advice from NE it can be concluded that AEoI of the Paston Great Barn SAC would not arise as a result of the Proposed Development either alone or in combination with other plans or projects.

River Wensum SAC

- 6.6.481. As noted above, the Applicant's position was that LSE would only arise as a result of indirect effects on the watercourse of plain to montane levels and Desmoulin's whorl snail features. The HRA report [APP-201] concludes that adverse effects on these features would be avoided because:
- a. the features were not found to be present in the onshore project area;
 - b. ex-situ habitats would be avoided through the use of trenchless techniques;
 - c. Scenario 2 only – changes to local hydrological conditions would not occur because there are no springs or seepages directly connected to the SAC;
 - d. Scenario 2 only – cable ducts would not affect groundwater flows for the SAC;
 - e. Scenario 2 only – the assessment in Chapter 20 of the ES demonstrates that the cable trenches would not impede subsurface flows; and
 - f. the mitigation measures in the OCoCP would be sufficient to avoid any impacts during cable installation.
- 6.6.482. NE [RR-099] and the EA [RR-095] raised concerns about the risk of drilling mud breakout during HDD and the need for site-specific water crossing plans. Both bodies considered that the level of detail provided in the original version of the OCoCP [APP-692] was insufficient to provide reassurance that effects on the water quality and hydrological regime of the SAC would be avoided. NE pointed out that during the Norfolk Vanguard OWF Examination the Applicant had committed to producing site specific water crossing plans on which NE would be consulted [RR-099].
- 6.6.483. During the Examination the Applicant provided additional information:
- a. A Clarification Note on Trenchless Crossing and Potential Effects of Breakout on the River Wensum SAC [REP1-039], which concluded that an outbreak of drilling mud would be unlikely to lead to permanent significant permanent changes in the geomorphological conditions of the SAC or to deterioration in hydromorphological and physio-chemical elements of the waterbody. However, it was acknowledged that an increase in turbidity could reduce light and the substrate quality for plants, although this was viewed as a low risk.
 - b. A Clarification Note and Method Statement for Crossing the River Wensum and adjacent Watercourses [REP2-034].
 - c. A revised version of the OCoCP [REP1-019] (further updated during the Examination [REP18-019]) to include:
 - i. a commitment to produce additional pre-construction and construction phase controls as outlined in [REP18-019, Section 11.1.6];
 - ii. a commitment to develop a scheme and programme for each watercourse crossing, diversion and reinstatement which would include site specific details regarding sediment management

and pollution prevention measures which are secured through Requirement 25 of the dDCO [REP18-019, Section 11.1.2].

- 6.6.484. As summarised in the RIES [PD-020], NE [REP3-022] and [REP7-050] and the EA [REP5-070] confirmed that the additional information addressed its concerns in relation to risks to water and substrate quality in the SAC.
- 6.6.485. NE also advised [RR-099] that the HDD compound that would be within the floodplain of the SAC should be restored in accordance with the River Wensum Restoration Strategy and the River Wensum SAC conservation objectives supplementary advice. Where possible, appropriate soil/ground moisture conditions should be restored so that water levels would be continuously at or just above the ground surface throughout the year.
- 6.6.486. The Applicant updated the OCoCP [REP1-018] and [REP1-019] to commit to review the Restoration Strategy and the River Wensum SAC conservation objectives during the development of the final OCoCP. It also stated that *"In addition, where possible the HDD compound within the River Wensum floodplain will be restored to the current soil/ground moisture conditions so that water levels are similar to those pre-disturbance"*.
- 6.6.487. It is noted that this commitment did not entirely match what NE had advised. Nonetheless NE advised that it was content that AEoI are unlikely [REP7-050].
- 6.6.488. The mitigation required to avoid AEoI has been secured through the following routes:
- a. Requirement 16 of the dDCO [REP18-009] commits the Applicant to trenchless cable installation techniques under the SAC in the event that Scenario 2 is followed.
 - b. Requirement 20 of the dDCO [REP18-009] prevents any stage of the onshore transmission works commencing until a code of construction practice for that stage has been approved by the relevant planning authority in consultation with Norfolk County Council, the Environment Agency and the relevant statutory nature conservation body. It must accord with the OCoCP [REP18-019].
 - c. The OCoCP submitted at D18 includes the revisions listed above and would be a certified document [REP18-019].
 - d. Requirement 25 of the dDCO which commits the Applicant to the production of site-specific water crossing plans before each stage of the onshore transmission works commences, has been retained in the final version of the dDCO [REP18-009] and in the rDCO.
- 6.6.489. The Applicant concluded that since AEoI of the SAC would not arise from the Proposed Development alone, there was no real prospect of an in-combination effect arising on the SAC [APP-201]. NE stated that this approach was not in line with the requirements of case law (notably the Waddenzee case). It advised that to comply with the requirements of the Habitats Regulations, even where a project does not give rise to

significant effects alone, it should still be considered in combination with other plans or projects to establish if significant effects would result [REP9-058].

- 6.6.490. The ExA agrees with NE's interpretation of the requirement in the Habitats Regulations to consider the effects of projects both alone and in combination with other plans or projects. However, NE then went on to note that the Onshore Clarification Notes [AS-025] did consider the Hornsea Project Three OWF cable route which could be under construction at the same time as the Proposed Development [REP9-057]. No other evidence was provided by any IP that suggested that any other plan or project should be taken into account in the assessment of effects on the integrity of the SAC.
- 6.6.491. The ExA is satisfied that all necessary mitigation has been adequately secured. Given the advice from NE and the EA, it can be concluded that AEOI of the River Wensum SAC would not arise as a result of the Proposed Development either alone or in combination with other plans or projects.

The Broads SAC

- 6.6.492. AEOI of the SAC were excluded by the Applicant [APP-201] on the grounds that surveys suggested that the presence of otter within the onshore project area is limited. Under Scenario 2, the North Walsham and Dilham Canal would be crossed using HDD, avoiding the canal and the bankside habitat. This would maintain any commuting route for otters along the canal and avoid disturbing any animals using the watercourse. If works were taking place within 100m of the canal all excavations would either be covered overnight or left with escape routes to allow otters to escape if they enter the excavations. Vehicles/tracks would be checked in the morning for the presence of sleeping otter.
- 6.6.493. The use of HDD to cross the canal is also relied on to avoid indirect effects on the qualifying habitat features, fen orchid and Ramshorn snail. The East Ruston stream would be crossed using a trenching methodology. The risk of pollutant release is held to be low; good practice pollution measures would also be employed to manage any accidental spills or leaks. A trenching methodology would be developed post-consent (secured through Requirement 25 of the dDCO [REP18-009] and in the rDCO). This would minimise the effects of any temporary dams or culverts and ensure that the water flow is maintained
- 6.6.494. For both scenarios, a Surface Water and Drainage Plan would be developed post-consent which would contain measures to minimise runoff while ensuring drainage of surrounding land continues.
- 6.6.495. NE initially stated that its concerns about drilling mud breakout also applied to The Broads SAC [RR-099]. It subsequently confirmed that given the distance between the HDD operations and the SAC, it was unlikely that AEOI would arise [REP2-080].

- 6.6.496. The comments on the assessment of in-combination effects for the River Wensum SAC also apply to this SAC.
- 6.6.497. The mitigation designed to protect otters during the construction phase is secured through the OLEMS [REP14-020] which is a certified document. As noted above, delivery of this version of the OLEMS is secured through Requirement 24 of the dDCO [REP18-009] and in the rDCO.
- 6.6.498. The other mitigation measures required to avoid AEoI of the SAC are secured through the same routes as the mitigation for the River Wensum SAC. The ExA is satisfied that these measures are sufficient to avoid AEoI of the SAC from the Proposed Development either alone or in combination with other plans or projects.

Norfolk Valley Fens SAC

- 6.6.499. The HRA report [APP-201] identifies potential adverse effects on the Booton Common SSSI which is a component SSSI of the SAC. The habitats which are the qualifying features of the SAC are dependent on groundwater and to some extent, surface water levels and quality. The installation of the onshore cable would cross two of its tributaries, with potential effects on the water supply to the SAC.
- 6.6.500. Measures to avoid impacts on water quality during construction for both scenarios would be secured and delivered through site-specific water crossing plans (secured through Requirement 25 of the rDCO) and Surface Water Drainage Plans (secured through Requirement 20 of the rDCO).
- 6.6.501. An investigation of the groundwater supply to the site identified the most likely source as being artesian water from the Chalk aquifer which is then discharged into the Blackwater Drain. There is relatively little discharge from the drift deposits which lie above the Chalk aquifer. The cable works would take place around 7m above the known depth of the Chalk aquifer and would not extend beyond the boulder clay layer. There is only weak connectivity between the Chalk aquifer and the superficial deposits above it [APP-201].
- 6.6.502. As there would be no excavation in the Chalk aquifer and there is only weak connectivity between the aquifer and the superficial deposits, the Applicant concluded that there would be no effect on the groundwater supply to Booton Common SSSI and hence to the SAC. This conclusion was not disputed by any IP.
- 6.6.503. NE initially stated that its concerns about drilling mud breakout also applied to Norfolk Valley Fens SAC [RR-099]. It subsequently confirmed that given the distance between the HDD operations and the SAC, it was unlikely that an AEoI would arise [REP2-080].
- 6.6.504. The comments on the assessment of in-combination effects for the River Wensum SAC also apply to this SAC.

- 6.6.505. The ExA is satisfied that the appropriate measures to avoid harm to the water supply to the SAC have been secured in the rDCO. AEoI of the SAC can be excluded.

6.7. CONSIDERATION OF ALTERNATIVE SOLUTIONS

- 6.7.1. As described in the previous sections, the Applicant maintained throughout the Examination that AEoI of SACs and SPAs could be excluded. The ExA does not agree with this conclusion in respect of:
- a. the lesser black-backed gull feature of the Alde Ore Estuary SPA;
 - b. the kittiwake, razorbill, guillemot and seabird assemblage features of the Flamborough and Filey Coast SPA; and
 - c. the sandbanks slightly covered by sea water all the time and reef features of the Haisborough, Hammond and Winterton SAC.
- 6.7.2. It has therefore considered the evidence submitted during the Examination which would allow the SoS to conclude that the tests in Regulation 64 of the Habitats Regulations have been met.
- 6.7.3. The Applicant provided several versions of its derogation case during the Examination [REP6-025], [REP7-024] and [REP11-011]. The case presented for "*no alternative solutions*" was based on the guidance listed [REP11-011, para 73].
- 6.7.4. The objectives for the Proposed Development were listed in [REP11-011, Table 4.2]. In summary they were:
- a. To contribute to enhancing the security of the UK's energy supply by providing UK-produced renewable energy as required by National Policy Statement (NPS) EN-1.
 - b. To provide low cost energy to the UK consumer. The Proposed Development site is stated to have been selected because its ground conditions and high wind resource which would make delivery efficient. Offshore wind is also stated to be one of the most cost-effective and easy-to-deploy sources of energy within the UK.
 - c. To contribute to the UK's drive to meeting carbon reduction commitments.
 - d. To contribute to the Offshore Wind Sector Deal and the Government's targets to reach 30GW and 40GW respectively of installed offshore wind capacity by 2030.
 - e. To contribute to the UK's industrial strategy and global leadership in the development of offshore wind projects resulting in socio-economic benefits at a UK and East Anglia/Norfolk level.
 - f. To help to create a positive legacy for Norfolk and East Anglia facilitating socio-economic development.
- 6.7.5. The potential harm resulting from the Proposed Development is defined in [REP11-011, Section 4.4] based on NE's estimates of the number of individuals affected.

6.7.6. The range of alternative solutions considered in [REP11-011] are summarised here:

Option considered	Reason for discounting
'Do nothing'	UK renewable energy targets are unconstrained so all available solutions are required as evidenced by the further licensing rounds announced by The Crown Estate (TCE). The other benefits from the Proposed Development would not be delivered.
Alternative locations in the UK	a. Site selection is based on a UK wide zone selection process, initially by the TCE and UK Government followed by detailed assessment of the former East Anglia Zone to identify sites with the least environmental/technical constraints and lowest energy cost. b. Sites located elsewhere in Europe would not meet UK legal or policy obligations for renewable energy or carbon reduction. c. Developing sites outside the Leasing Round Area would take too long to contribute to the 2030 Sector Deal.
Repowering existing OWFs	a. Repowering of existing OWF is not likely to occur for at least another decade so would not meet the requirement to contribute to the 2030 Sector Deal. b. Existing OWFs are smaller in capacity than the Proposed Development so a greater number would have to be re-powered, compared with larger projects such as the Proposed Development, to deliver the Government's climate change targets.
Use of previously identified OWF sites	a. Where OWFs have already been refused consent, the reasons for those refusals are still likely to be present, making the sites unsuitable for development. Some OWFs have not progressed for technical reasons so again would not be sites suitable for development b. OWF sites not located in the vicinity of East Anglia the local socio-economic benefits would not be realised.

Option considered	Reason for discounting
	c. Baseline data for these sites would now be out of date so would require new data collection.
Consenting of other large scale OWF	To deliver the 2030 Sector Deal, most if not all the OWF generation capacity in planning, pre-construction/construction, extensions and Round 4 leasing will be required.
Alternative offshore cable corridors	a. The grid connection is made by National Grid which constrains landfall location and offshore cable routes. b. The location of landfall areas on the coast is constrained by the presence of designations including The Wash and North Norfolk Coast SAC/SPA Ramsar site and the Broads National Park. c. Technical studies were undertaken by the Applicant to identify landfall sites suitable for HDD and to inform understanding of cable installation and design. d. Offshore cable routes are constrained by the presence of other OWF, shipping and navigation routes, existing cables, oil and gas infrastructure, Military Practice and Exercise Areas, aggregates dredging grounds, nature conservation designations, commercial fishing and sensitive seabed features.
Alternative design solutions	The Applicant has committed during the Examination to reduce the number of turbines and to increase draught height. Further decreases in turbine numbers are constrained by the turbine designs which are commercially available which would allow the 1.8GW output to be maintained. A reduction of at least 50% in turbine numbers would be required to make any significant difference to bird collisions. It would also make the project less cost-effective and less able to provide low cost energy. Further alterations to the draught height is limited by the capacity of installation vessels currently available. The Applicant cannot guarantee that the largest vessels would be available at the time of construction and

Option considered	Reason for discounting
	needs to retain some flexibility. Further raising of the draught height would not be feasible.
Seasonal restrictions on turbine operation	The relatively small number of collisions contributed by the Proposed Development to the in-combination total for the kittiwake and lesser black-backed gull SPA populations means that any reduction in total collision risk would be very limited. It would also reduce the output, affecting cost effectiveness and contribution to renewable energy.
No cable protection in the HHW SAC and/or marker buoys	The Applicant reduced the cable protection within the SAC from 10% to 5% of the cable length following an interim cable burial study. The method of cable installation would be agreed with NE and MMO; the Applicant is continuing to develop its understanding of the burial methods and tools most likely to achieve burial. However, it feels that a contingency of 5% is necessary to deal with situations where cable burial is not possible. During the Examination the Applicant has also undertaken: a. to not to use rock armour in the SAC; b. to agree disposal of sediment from sandwave levelling with the MMO and NE; c. to not place cable protection in areas in the SAC identified for reef management measures; and d. removal of all cable protection (other than for cable crossings) within the SAC when the Proposed Development is decommissioned. Assessments of risk to cables is based on the degree of physical protection in the final design and unprotected cables are likely to be seen as an unacceptable risk to insurers and offshore transmission owners. Marker buoys: a. are not considered equivalent to physical protection methods; b. reduce risk of damage from bottom trawling but not from other damage

Option considered	Reason for discounting
	such as anchor dragging in poor weather; c. present a snagging hazard by leaving exposed cables on the seabed; d. could become detached leaving exposed cables unmarked; and e. would require consideration of the implications for navigation safety.

- 6.7.7. The Applicant did not consider that there were any feasible alternative solutions and so there were no potential alternative solutions which would lead to less harm on the affected designated sites.
- 6.7.8. NE suggested [REP9-057] that the Applicant should consider use of surface laid cables and the use of marker buoys instead of cable protection within the SAC. The Applicant advised why it did not consider this to be a feasible alternative to cable protection (see Table above) [REP10-042] and REP11-011]. NE considered that the Applicant had taken all reasonable steps to avoid, reduce and mitigate the impacts on the kittiwake and lesser black-backed gull features of the SPA.
- 6.7.9. TWT [REP16-031] argued that the Applicant had not exhausted all alternative solutions in relation to effects on the SAC. The use of rock armour in the SAC should be avoided and the use of cable management measures which involve using exposed cables.
- 6.7.10. The ExA is satisfied that the Applicant has presented a case that would allow the SoS to conclude that there are no alternative solutions to the delivery of the Proposed Development.

6.8. IMPERATIVE REASONS OF OVERRIDING PUBLIC INTEREST (IROPI)

- 6.8.1. The Applicant's case for the imperative need for the Proposed Development as presented in [REP11-011] rested on the following points (in summary):
- a. International agreements and UK legislation, notably the COP21 UN Paris Agreement, the 2018, report by the Intergovernmental Panel on Climate Change and the Climate Change Act 2008 make it clear that there is an urgent requirement for a reduction in carbon emissions.
 - b. UK energy policy and strategy, notably the UK Energy Policy: Renewal Energy Strategy (2009) and Road Map: Updates (2012 and 2013), the UK Clean Growth Strategy (2017), the UK Industrial Strategy, the Declaration of Climate Emergency and the UK Government to Net Zero carbon emissions by 2050 and the

Industrial Strategy: Offshore Wind Sector Deal (2019) and NPS EN-1 and EN-3 require delivery of substantial amounts of renewable energy with offshore wind being one of the major components. The Government also recently committed to an increase in offshore wind capacity by 1-2GW per year between now and 2030.

- c. Socio-economic benefits included the opportunity to build on the UK's maritime engineering skills, to secure supply chain and other employment opportunities in the UK and to maximise social and economic opportunities from investment in energy infrastructure.
- d. The risk to human health from effects associated with climate change and the health benefits from improvements in air quality associated with the use of renewable energy.
- e. The consequences to the environment from climate change – the Applicant noted that the RSPB has identified climate warming as a threat to kittiwake breeding success. The Applicant also cited the Strategic Environmental Assessment North Sea Energy project which has concluded that changes in prey availability due to climate change is the current pressure which has the largest impact on kittiwake and lesser black-backed gull at the North Sea level.

- 6.8.2. The Applicant argued that the Proposed Development can be viewed as of overriding interest compared with the extent of harm to the interests protected by the SPAs and SAC, because of the public interest from the benefits of the Proposed Development. These are the benefits in the reduction in carbon emissions served by renewable energy generation and the associated benefits to human health, public safety and the environment.
- 6.8.3. It also noted that in terms of the harm to the SPAs and the SAC predicted scale of effects is relatively small from the Proposed Development. None of the SAC and SPA features potentially affected by the Proposed Development are classed as priority features (as defined by the Habitats Directive).
- 6.8.4. The ExA notes that the absence of priority habitats and species allows the consideration of benefits of a social and economic nature. The ExA also notes that the extent of the harm to the relevant site features from the Proposed Development alone is relatively small; the AEoI arise from in-combination effects. The ExA is content that the benefits of the Proposed Development, particularly from its contribution to the reduction in UK carbon emissions and maintaining energy security, are sufficient to allow the SoS to conclude that the Proposed Development is of imperative overriding public interest.

6.9. COMPENSATORY MEASURES

- 6.9.1. Having due regard to the SoS's comments in the Norfolk Vanguard OWF decision letter and the Hornsea Project Three '*minded to approve*' letter, that "*the development consent process for nationally significant*

infrastructure projects is not designed for consultation on complex issues, such as Habitats Regulations Assessment, to take place after the conclusion of the Examination” the ExA strongly advised the Applicant and NE to attempt, without prejudice, to agree on compensatory measures for the three designated sites where no AEoI was disputed. The ExA is content that the Applicant and NE have progressed their discussions throughout the remainder of the Examination. While possible mechanism for delivering measures have been agreed, there remains further detail to be agreed. The ExA believes that there are sufficient in-principle plans for the SoS to decide whether the compensatory measures are achievable.

- 6.9.2. The Applicant developed in-principle plans for compensatory measures, delivery of which were secured through Article 44 and Schedule 19 of the dDCO [REP18-009] and in the rDCO. The dDCO requires the Applicant to develop strategies for the delivery of the relevant measures and monitoring and reporting their effectiveness no less than 12 months before the commencement of any offshore works. The strategies would be submitted to the SoS for approval in consultation with the relevant statutory nature conservation body. The final versions of the in-principle compensatory measures plans are listed as certified documents in the final version of the dDCO [REP18-009] and in the rDCO.

Compensatory measures for the Alde-Ore Estuary SPA

- 6.9.3. The final version of the Applicant’s in-principle compensatory measures plan submitted during the Examination [REP11-013] contained the following measures:
- a. Provision of predator-proof fencing to provide a nesting area where mammal predators are excluded.
 - b. To fund a coordinator to facilitate the organisation of a stakeholder working group which would review the factors affecting the status of the population and proposals for conservation measures.
- 6.9.4. The Applicant stated that while it seems likely that provision of a nesting area would be an effective measure, it would be necessary to confirm that the current poor breeding success at the colony is linked to mammalian predation and not to other factors. It would also ensure that other measures which could be effective are not overlooked. If necessary, trials of measures would be undertaken to establish effectiveness.
- 6.9.5. The Applicant also identified areas of Orford Ness which would be suitable for lesser black-backed gulls if it was made fox-proof. The extent of the area to be fenced has not been finalised but the Applicant suggested that it would not be appropriate to enclose much less than an area of 4ha. In the Applicant’s view this would enhance breeding success at the SPA to an extent that would greatly exceed the loss of 2.1 birds per annum (based on NE’s calculation of collision-related mortality) attributed to the Proposed Development.

- 6.9.6. The Applicant proposed a phased approach with the delivery co-ordination being appointed first and setting up a working group which would be likely to involve the Applicant, NE, the local planning authority, the RSPB and the National Trust (as landowners and managers). A scoping study of potential measures would be undertaken; the working group would then consider which measures would be appropriate and these would be implemented. The costs would be met by the Applicant. It advised that it might not be possible to have all the measures in place before the operation of the Proposed Development began but considered that the proposal was likely to over-compensate for any losses. This would outweigh a short-term delay in delivery.
- 6.9.7. The strategy would include monitoring proposals, the results of which would be provided to the SoS, along with any proposals to address effectiveness. Proposals to improve effectiveness of measures would be implemented as approved by the SoS.
- 6.9.8. The following measures were considered by the Applicant but not taken forward:
- a. Closure of sandeel fisheries to provide improved prey availability – measure excluded because sandeels are not considered to be a major component of the lesser black-backed gull diet and the primary North Sea sandeel fishery areas are not within foraging range of the SPA population.
 - b. Ceasing culling of lesser black-backed gulls at the SPA – excluded as culling is not currently undertaken at the site.
- 6.9.9. NE confirmed that it is content with the proposed measures [REP15-009], subject to the dDCO being updated to include wording which specifically referred to measures to install predator proof fencing. It subsequently confirmed [REP16-024] that it is satisfied with the revised wording of Schedule 19 Part 2.
- 6.9.10. The RSPB [REP17-012] raised concerns about the wording of Part 2 of Schedule 19 of the dDCO [REP18-009]. It raised concerns that the measures were too narrowly focussed on predator control and did not adequately address other factors affecting breeding success [REP17-012]. Other concerns included the difficulty of distinguishing between measures necessary to restore the favourable conservation status of the SPA, the timing of delivery of the measures before harm occurs, the location of measures within the SPA and the duration of the compensatory measures. In its view, the measures should be delivered outside the SPA boundaries.
- 6.9.11. The RSPB [REP17-012] also advocated that the wording of Part 2 should be expanded considerably to include clauses which address its concerns. The Applicant considered that the final wording in the dDCO [REP18-009] was sufficient to allow the implementation of the type of measures advocated by the RSPB. The RSPB [REP18-038] advised that these revisions did not address their concerns.

- 6.9.12. The ExA agrees that [REP11-011] provides a useful potential mechanism which *could* deliver compensatory measures. The ExA acknowledges that the Applicant has gone some way to identifying potential locations for compensatory measures [REP16-004]. This potentially allows the delivery of compensatory measures outside the SPA as advised by the RSPB. However, the measures are far from finalised; the Applicant advised that it did not consider it appropriate to go further than developing in-principle measures until it was aware of the SoS's conclusions on AEoI of European sites [REP10-042] and [REP16-004].
- 6.9.13. While the wording of the dDCO secures a possible mechanism for delivering measures, the ExA feels that there is insufficient detail in the material available to allow it to advise the SoS that a package of measures could be delivered which would protect the coherence of Natura 2000 as required by Regulations 64 and 68 of the Habitats Regulations.

Compensatory measures for the Filey and Flamborough Coast SPA

- 6.9.14. The final version of the Applicant's in-principle compensatory measures plan submitted during the Examination [REP11-012] proposed the construction of artificial nest sites. The Applicant calculated that an area of sea wall measuring 30m by 8m would accommodate 200 pairs of kittiwake which in turn would produce around seven times the 14 birds per annum that would be lost to the SPA colony (based on NE's preferred calculation method). A wall attached to an offshore structure would be closer to foraging grounds than onshore locations and would be likely to support a colony with higher productivity than one at an onshore location.
- 6.9.15. The Applicant also considered the potential for reducing the impacts of sandeel fishing [REP11-012]. It cited evidence which shows that availability of sandeel as a prey item can have a significant effect on kittiwake breeding success. There is also evidence that fishing activity is affecting the abundance of sandeel in the region. Evidence of kittiwake breeding success following the closure of sandeel fisheries is limited but the Applicant pointed to an example in Scotland where this had been demonstrated [REP11-012].
- 6.9.16. The Applicant concluded that there was no UK authority at present with the jurisdiction to deliver fisheries management measures which would allow the closure of sandeel fisheries. The Applicant considered the option of purchasing fishing quota but noted that the quota is currently held entirely by Danish fisheries interests. It concluded that reduction in fishing pressures on sandeel through either mechanism would not be practical.
- 6.9.17. Predator control was also considered by the Applicant but this has not been identified as an issue of concern at the SPA. Research by the JNCC on the national seabird population did not identify predation as a major cause of kittiwake decline [REP11-012]. The Applicant concluded that

predator control at the colony was unlikely to deliver any significant benefits.

- 6.9.18. While NE agreed that artificial nests could in principle contribute to the coherence of the Natura 2000 network if the measures delivered a net increase in the overall population [REP9-045], it remained concerned about confining the measures only to the provision of artificial nesting sites and the evidence that this approach would be successful [REP9-046], [REP9-057] and [REP14-065]. It advised that measures should be identified which would increase productivity at the colony [REP9-045], [REP9-046] and [REP10-064] such as controls on fisheries. It acknowledged that it was not possible for the Proposed Development alone to deliver fisheries controls or closures [REP9-046] but advised that alternative draft conditions should be added to the dDCO to allow for a range of compensatory measures for the SoS to consider [REP14-065].
- 6.9.19. The Applicant provided additional evidence drawn from published studies [REP16-003] to address NE's concerns in relation to the likely success of the proposed measures. It also produced evidence that Associated British Port would in principle be willing to deliver artificial nesting sites at the Port of Lowestoft [REP16-003] and [REP16-004]. It also altered the wording of Schedule 19, Part 1 of the dDCO. NE, while it welcomed much of the Applicant's proposals was still unable to agree the detail of the measures [REP17-010]. The Applicant [REP18-026] considered that the issues raised by NE could easily be dealt with through refinement of the measures post-consent.
- 6.9.20. The RSPB [REP15-013] and [REP17-012] also raised concerns about the likely success of the artificial nesting sites and the limited detail available about the proposals including the location of any structures, the timescale for delivery and the time that the measures would be in place. It also provided alternative wording for the dDCO which it felt would give more confidence in the compensatory measures [REP17-012]. The Applicant [REP18-026] considered that the revisions to the wording of Part 1 of Schedule 19 [REP18-009] would be sufficient to deal with the RSPB's concerns. It considered that the specific points raised by the RSPB about the effectiveness of the proposed measures were issues of detail which could be addressed as the measures were developed post-consent. The RSPB advised [REP18-038] that its concerns remained.
- 6.9.21. The Applicant did not provide any compensatory measures for razorbill, guillemot or gannet. It noted that the SoS decision on Norfolk Vanguard OWF concluded that there would be no AEoI of the SPA as a result of effects on these features. In addition, NE's advice for the in-combination effects of the Proposed Development was that in-combination effects on the integrity of the SPA would only arise in combination with Hornsea Projects Three and Four OWFs. In the Applicant's view this made it unnecessary to develop compensatory measures for these species [REP10-033], [REP10-034], [REP10-042] and [REP16-004].
- 6.9.22. As with the compensatory measures for the Alde-Ore SPA, the ExA considers that the wording in the dDCO offers a useful mechanism for

securing compensatory measures. However, it appears to the ExA that there is a great deal of detail still to be resolved as to the effectiveness and delivery of the proposed measures. In addition, the measures do not provide any compensation for effects on the razorbill and guillemot populations of the SPA. The ExA is therefore unable to advise the SoS that a package of compensatory measures is in place which would protect the coherence of Natura 2000 as required by Regulations 64 and 68.

Compensatory measures for the HHW SAC

- 6.9.23. The final version of the Applicant's in-principle compensatory measures [REP11-014] proposed an extension of the SAC or the designation of other suitable habitat through the following actions. The Applicant undertook to agree the proposal with NE, JNCC and Defra and then to provide support to the statutory bodies to progress the designation. Part 3, Schedule 19 of the dDCO [REP18-009] (and in the rDCO) secures the delivery of a strategy to promote an extension of the SAC. The strategy must be in accordance with the in-principle plan.
- 6.9.24. The Applicant noted [REP11-014] that once the extension had achieved the status of a potential SAC, compensation would be effective for the Proposed Development. The Applicant would provide ongoing support during the formal consultation process to the SNCBs, probably through funding a post for several years.
- 6.9.25. The Applicant stated that the details of the size and location would be agreed with the SoS, the SNCBs, the MMO and Defra, following the conclusions of the SoS in relation to AEoI of the SAC. The area of any extension however is likely to be at least 0.2km². There is clear evidence of potential for extension where areas of sandbank and reef features stretch beyond the boundaries of the SAC [REP7-027] and [REP10-034]
- 6.9.26. The Applicant noted that there is some degree of uncertainty about securing the SAC extension but states that the Possible Special Area of Conservation (pSAC) designation would provide short-term compensation. If the consultation responses on the pSAC were unfavourable, the Applicant would be responsible for identifying alternative measures.
- 6.9.27. The Applicant considered several other potential measures but discounted them [REP11-014]:
- a. Establishment of a new reef feature within the SAC: discounted because of the difficulty of directly establishing *S. spinulosa* reef. There is little evidence that other forms of biogenic reef can be established apart from native oyster beds. Native oyster beds are not classed as Annex I habitat under the Habitats Directive so would not contribute to the coherence of the Natura 2000 network.
 - b. Fisheries management to reduce intrusive fishing methods which affect the SAC: discounted because at present no authority has the

jurisdiction to deliver fisheries management areas as compensation.

- c. Removal of disused anthropogenic infrastructure and litter such as cables, pipelines and fishing gear from the SAC seabed: discounted because where infrastructure is approaching the end of its life, it will be the owner's responsibility to decommission it anyway so it may not provide additional compensation. The Applicant consulted the EIFCA but was unable to identify known areas where lost fishing gear could be removed. The Applicant did not consider that it could demonstrate that the measures would be feasible.

- 6.9.28. NE agreed in principle with the proposal to extend the SAC but requested more details [REP9-045], [REP9-048] and [REP9-057]. It agreed with the Applicant's decision to discount other measures apart from the removal of disused anthropogenic structures but acknowledged the practical difficulties of delivering these measures. It agreed that native oyster reefs would not be compensation for lasting changes to the reef SAC feature. The Applicant considered that the details of the measures should be addressed after consent had been granted [REP10-033] and [REP10-042].
- 6.9.29. The EIFCA raised extensive concerns about the proposals to extend the SAC [REP10-055] and [REP13-034]. It disputed the justification for the extent of the area which could be affected by the SAC extension. It was concerned about the potential socio-economic effects which could result from the SAC extension, particularly in relation to potential requirements for further fisheries management. It considered that insufficient information had been provided to allow the SoS to make a judgement about the impacts of SAC extension on marine ecology and sea users. It stated that it would be supportive of measures to remove disused infrastructure but would need to see further details.
- 6.9.30. The Applicant responded [REP11-008] that the area given in [REP11-014] illustrates an area which could be delivered as compensatory measures. The final figures would only be confirmed as part of the strategy to be submitted for the SoS's approval. The level of fishing activity within the area of the indicative extension is low, making the need for fisheries management measures unlikely.
- 6.9.31. TWT [REP16-031] was concerned about the feasibility of extending the SAC because of the timescales and resources required. It also considered that this approach could undermine the status of other designated sites and create problems for other OWFs in future. It considered that fisheries management measures should be delivered at a strategic level to allow headroom for individual OWFs. It did not consider that the removal of litter and infrastructure met the EU and Defra guidance on compensatory measures and should in any case be the responsibility of the asset owners. The Applicant responded [REP17-003] that it was confident that the measures could be delivered and would not lead to the issues raised by TWT.
- 6.9.32. As with the compensatory measures for the Alde-Ore SPA, the ExA considers that the wording in the rDCO offers a useful mechanism for

securing compensatory measures. However, the ExA is concerned that there is considerable uncertainty about the feasibility of delivering the extension of the SAC before the Proposed Development becomes operational. The ExA is therefore unable to advise the SoS that a package of compensatory measures is in place which would protect the coherence of Natura 2000 as required by Regulations 64 and 68.

6.10. HRA CONCLUSIONS

6.10.1. The ExA has considered all the evidence relating to effects on sites protected under the Habitats Regulations put before it during the Examination and has reached the following conclusions:

- a. The ExA concludes that adverse effects on the integrity of the lesser black-backed gull feature of the Alde-Ore SPA/Ramsar site could not be excluded from the Proposed Development in combination with other OWF as a result of collision related mortality.
- b. The ExA concludes that adverse effects on the integrity of the kittiwake, razorbill and guillemot features of the Flamborough and Filey Coast SPA could not be excluded from the Proposed Development in combination with other OWFs as a result of collision with offshore WTGs and displacement-related mortality.
- c. The ExA concludes that adverse effects on the integrity of the reef and sandbanks slightly covered by sea water all the time, features of the Haisborough, Hammond and Winterton SAC could not be excluded for the Proposed Development alone or in combination with other plans or projects as a result of the location of the OWF array and cable installation and protection.
- d. The ExA recommends that the SoS concludes that the requirements of Regulation 63 of the Habitats Regulations cannot be met in respect of these sites and features.
- e. The ExA recommends that the SoS concludes that these are the only SAC, SPA or Ramsar sites where adverse effects on integrity would arise from the Proposed Development alone or in combination with other plans or projects.
- f. The ExA has considered the evidence on potential alternative solutions to delivering the objectives of the Proposed Development and the case for imperative overriding public interest. It recommends that the SoS can conclude that the Proposed Development meets the requirements of Regulation 64 of the Habitats Regulations.
- g. The ExA has considered the compensatory measures proposed by the Applicant for the relevant features of the Alde-Ore SPA/Ramsar site; Flamborough and Filey Coast SPA and the Haisborough, Hammond and Winterton SAC. However, the compensatory measures proposed by the Applicant have not reached the point of development where the ExA can be confident that the measures would be effective or could be successfully delivered. The ExA recommends that the SoS concludes that the requirement under

Regulation 68 of the Habitats Regulations to secure compensatory measures has not been met and therefore consent for the Proposed Development cannot be granted.

7. CONCLUSION ON THE CASE FOR DEVELOPMENT CONSENT

7.1. INTRODUCTION

7.1.1. In this chapter the ExA sets out its overall findings and conclusions on the case for development taking into consideration: the ExA's reasoning on project-wide matters that emerged during Examination (reported in Chapter 4), conclusions reached and weight given to individual planning issues that were examined (reported in Chapter 5), and the conclusion on the Habitats Regulations Assessment (HRA) (reported in Chapter 6).

7.1.2. The ExA's considerations in this Chapter are predicated upon the assumption that the relevant local authorities have sufficient capacity to enact their role in relation to the discharge of requirements included in the rDCO. As is discussed in Chapter 9, at the end of the Examination although some discussions had been held about potential Planning Performance Agreements, no such agreements were in place.

7.2. THE PLANNING BALANCE

Need for Development

7.2.1. When it comes to assessing the need for this development, the ExA has assessed it against the policy requirements in NPS EN-1 which establishes a need for:

- a. all types of energy infrastructure (NPS EN-1, Section 3.1);
- b. electricity generation (NPS EN-1, Section 3.3); and
- c. sourcing energy from renewables (Section 3.4).

7.2.2. NPS EN-1 Section 3.1 has established that there is a need for all the types of energy infrastructure in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions. It follows that all applications for development consent for the types of infrastructure covered by the energy NPSs should be assessed on the basis that the Government has demonstrated that there is a need for those types of infrastructure and the SoS should give substantial weight to the contribution which projects would make towards satisfying this need.

7.2.3. NPS EN-1 Section 3.3 establishes that the Government believes there is an urgent need for new electricity NSIPs to meet the likely increase in need for electricity for domestic and industrial heating and transport, to maintain a resilient system that can deal with unexpected events, lower the risk of a supply interruption and avoid rising and volatile prices. Given that energy NSIPs take a long time to move from design conception to operation, there is an urgent need for new (and particularly low carbon) energy NSIPs to be brought forward as soon as possible.

- 7.2.4. The Government believes that a diverse mix of all types of power generation helps to ensure security of supply. In this regard, renewables such as offshore wind offer a low carbon and proven fuel source, even if these technologies may provide intermittent generation. Section 3.4 establishes the Government's commitment to sourcing energy from renewable sources to tackle climate change, reducing the UK's emissions of carbon dioxide. To this end, offshore wind is expected to provide the largest single contribution towards the renewable energy generation targets.
- 7.2.5. The ExA is content that the Proposed Development would significantly contribute to the Government's "net zero" emissions target, with a high-level estimate of energy generated over the 30-year lifetime of the project to be 248,000GWh. The ExA also accepts that the carbon payback of emissions being likely to be one to two years from the point of first generation of electricity.
- 7.2.6. The ExA is satisfied that the Proposed Development meets all the above policy requirements and that the need for the Proposed Development has been established. The ExA considers that the Proposed Development would make a significant contribution to satisfying the need for new electricity generation through offshore wind energy and carries substantial weight in favour of the Order being made.

Environmental Impact Assessment and the Environmental Statement

- 7.2.7. The ExA considers that the Environmental Statement (ES), and the supplementary information submitted during the Examination provide an adequate basis for the environmental impact assessment (EIA). The ExA is satisfied with the way in which that the examination of alternatives has been addressed and that the requirements of NPS EN-1 and the EIA Regulations have been met. The ExA is generally satisfied with the methodology adopted for cumulative impact assessment (CIA) and that the other projects and proposals included in the CIA are consistent with that required under NPS EN-1 and Planning Inspectorate Guidance. The exception to this point is the inclusion of projects which are not reasonably well described and sufficiently advanced in the socio-economic CIA, which is explained below. In terms of inter-related effects, the ExA has reached its conclusions (reported below) based on evidence submitted during the Examination in addition to that included in the ES.
- 7.2.8. The ExA considers that the ES and the associated information provide an adequate assessment of the environmental effects of the Proposed Development and an adequate basis for decision making by the SoS. Schedule 18 of the rDCO sets out the documents for certification of which the ES and associated documents form part.

7.3. FINDINGS AND CONCLUSIONS IN RELATION TO PLANNING ISSUES

Introduction

- 7.3.1. The ExA has explored and considered in Chapters 5 and 6 all issues identified in the initial assessment of principal issues and those raised during the Examination. This section below includes a summary of the ExA's conclusions on planning issues (essentially in the order covered in this Recommendation Report), highlighting measures that are secured in the rDCO and compliance with the policies in NPS EN-1, EN-3 and EN-5, and identifying matters to which the ExA has ascribed either no weight, little weight, medium weight or substantial weight in the planning balance.
- 7.3.2. There are several matters which the ExA wishes to highlight for the SoS. These matters arise from evidence submitted during the Examination, and require strategic consideration which cannot be secured in the Order. These have been reported in Chapters 4 and 5 and are included under the relevant summary below. They have not had a bearing on the ExA's conclusions and the overall planning balance, as they are not matters to be considered in the scope of this Examination.

Traffic and Transport

- 7.3.3. The ExA finds that the Applicant's proposed mitigation measures have improved over the course of this Examination and are now agreed with Highways England and NCC (the local highway authority). The ExA believes that the effects of the construction HGV traffic generated by the Proposed Development and cumulatively with Hornsea Project Three OWF would be mitigated, to some extent, by the revised Highway Intervention Scheme (HIS) in Cawston and the Highway Mitigation Scheme (HMS) in Oulton secured in the OTMP and R21 in the rDCO.
- 7.3.4. The ExA is content that if noise-related issues arise due to increased HGV traffic they would be addressed through the noise monitoring plan in Cawston, developed as part of the CNMP, in the CoCP. The ExA concludes that the mitigation secured in the OTMP and CoCP, secured in the rDCO would ensure that the Proposed Development meets the policy requirements of NPS-EN1.
- 7.3.5. While the ExA accepts the scope and findings of the CIA the cumulative effects of construction traffic of the Proposed Development and any other major construction projects would not go unobserved in the area. Notwithstanding NCC's agreement to the revised HIS and HMS, the ExA concludes that the burden of effects on the local highway network and on local communities during construction would be heavy despite the proposed mitigation.
- 7.3.6. Taking all these traffic and transport matters into account, the ExA attributes medium weight against the making of the Order.

Landscape and Visual Effects, Good Design, Open Space and Green Infrastructure

Landscape effects

- 7.3.7. For the landfall and cable corridor, the ExA is satisfied that adverse effects on landscape character would be short term during construction, reversible and mitigated appropriately through planting reinstatement, thereby complying with NPS EN-1, and NPS EN-5 (where it applies). In the case of the adverse effects on the landscape character at Necton in the vicinity of the substations, the ExA considers that the accumulation of non-significant and significant adverse effects, which are not capable of reversal in a reasonable time scale, requires a comprehensive and detailed design approach to post-consent discharge of requirements R16, 18, 19 and 24 in order to comply with NPS-EN-1.

Visual effects

- 7.3.8. The ExA is satisfied that adverse visual effects at the landfall and along the cable corridor would be mitigated appropriately in a reasonable timescale, thus complying with NPS EN-1, and NPS EN-5 (where it applies). The ExA agrees that the adverse visual effects at the area where the substations would be located would be significant and not reversible in a reasonable timescale. The ExA is persuaded by the submissions from many local residents, community groups, landowners and Necton Parish Council that there should be local involvement in the ongoing design process for the buildings because many details including levels, layout, height, mass, materials, colour and planting remain unspecified in the rDCO and require need approval through discharge of requirements. The ExA accepts the Applicant's need for flexibility in the rDCO and welcomes the additions made to its Design and Access Statement, which sets out a design process and preparation of a Design Guide. However, in judging how these would mitigate the adverse visual effects, the ExA considers more controls are needed such that the local authority has the wherewithal to ensure that the details which would be submitted post-consent would comply with the need to balance functionality with aesthetics specifically, and generally with NPS EN-1. To address this, the ExA has added a requirement for independent design review to be undertaken, which is reported below under Good Design.
- 7.3.9. The ExA also has continuing concerns over the complexities of the proposed post-consent processes for discharging multiple, inter-related requirements for the substations, and the resourcing implications for the local authority. The ExA suggests that the SoS may wish to satisfy themselves that the local authorities have sufficient capacity to enact their role in relation to the discharge of the requirements included in the rDCO, in the absence of an agreed Planning Performance Agreement (PPA).
- 7.3.10. Taking all these landscape and visual matters into consideration, the ExA attributes medium weight against the making of the Order.

Good design

- 7.3.11. The ExA considers that the Applicant's approach to achieving functional but aesthetically acceptable designs, within the limitations of operational

and other constraints for the onshore substations, has been refined in a positive manner during the Examination. However, the ExA has ongoing concerns about how the post-consent discharge process would deliver an integrated design approach at Necton, where the substations are located; especially for Scenario 1. For this reason, the ExA has made an addition to Requirement 16 (Detail design parameters onshore) in the rDCO which states that details for the onshore project substation should be subject to an early, independent design review. With this in place, the ExA is satisfied that the requirements of NPS EN-1, EN-3 and EN-5 would be met, as far as possible within the confines of the Proposed Development. However, the ExA also considers that a strategic design approach is necessary for the substation area in the case of Scenario 1.

- 7.3.12. Although the ExA has suggested that the independent design review should cover the wider area in the case of Scenario 1, this could not be secured. The Applicant has committed to consider a design approach which can be applied across both projects in its Design and Access Statement, and this is secured. However, the ExA suggests that the SoS might wish to consider additional ways that a holistic design approach in this area under Scenario 1 could be made more certain, such as through the proposed Co-operation Agreement between the Applicant and the undertaker for Norfolk Vanguard OWF. As with landscape and visual matters, above ensuring that the relevant local authorities have sufficient capacity to enact their role in relation to the discharge of requirements included in the rDCO would be important.
- 7.3.13. Even with effective implementation of measures to reduce, as far as is practicable, the adverse landscape and visual effects of the onshore elements of the Proposed Development the ExA considers that the principles of good design would not entirely be met at the substations, and has therefore ascribed little weight against the Order being made to matters of good design. This is predicated on the ExA's addition of an early independent design review in the rDCO, without which the ExA considers that good design would weigh further against the making of the Order.

Open space and green infrastructure

- 7.3.14. The ExA considers that there is no requirement for the provision of new or additional open space because there is no loss of open space or sustained adverse effect on public access. In terms of green infrastructure, the ExA is content that the mitigation planting and its management and maintenance, which is subject to detail design, secured by R18, R19 and R24 would deliver multiple benefits for biodiversity, landscape and visual effects, balancing the fragmentation in areas such as at the substations.
- 7.3.15. As with landscape and visual matters, there would be complex post-consent discharge processes, so the SoS may wish to satisfy themselves that the local authorities have sufficient capacity to enact their role in relation to the discharge of the requirements included in the rDCO.

- 7.3.16. Taking these matters into consideration, the ExA concludes that open space and green infrastructure matters do not weigh against the making of the Order.

Onshore Construction Effects

- 7.3.17. The ExA considers that onshore construction effects have been satisfactorily resolved. A trenchless crossing at the B1149 has now been secured in the rDCO, which the ExA considers is necessary for the Proposed Development alone, as well as cumulatively with Hornsea Project Three OWF. The ExA is satisfied that relevant mitigation, including the Air Quality Management Plan, is secured in the rDCO through the CoCP, and through the OTMP, the Landscaping Management Scheme and the Ecological Management Strategy. The ExA is content that with regard to the onshore construction effects, the Proposed Development meets the policy requirements set out in NPS EN-1 and NPS EN-3. With respect to construction effects, the ExA attributes little weight against the making of the Order.
- 7.3.18. The ExA notes that there would be a reliance on post-consent approvals by the relevant local authorities in order for management plans to secure and deliver the required mitigation. The ExA notes the absence of an agreed PPA. As such, the ExA highlights to the SoS that post consent approvals are numerous and complex, and measures would need to be in place that ensure the relevant local authorities have the right skills and resources to handle the submissions and approvals adequately within the timescales set.
- 7.3.19. The ExA has reported inter-related onshore construction effects in various parts of this Recommendation Report, to cover matters relating to construction traffic, visual and heritage effects, noise and vibration, water resources and flood risk, land use and agriculture, and physical and mental health. Taking into account the totality of adverse effects of construction activities, the ExA attributes medium weight against the making of the Order.

Noise and Vibration

- 7.3.20. The ExA agrees with the changes made to the OCoCP over the course of the Examination regarding the definition and location of Noise Sensitive Receptors (NSR) and the proposed enhanced mitigation, which are agreed with relevant planning authorities and secured through R20 CoCP in the rDCO. With the identification, location and proposed mitigation at NSRs, that ExA can conclude that the Proposed Development complies with NPS-EN1. In accordance with NPS-EN1, the ExA is satisfied that with the measures secured in R20 CoCP, the Proposed Development would employ good design to mitigate adverse noise effects.
- 7.3.21. The ExA acknowledges the concerns raised regarding operational noise at the project substation in Necton, but is persuaded by the Council and the Applicant, and concludes that the measures set out in R20 (CoCP), and R27 (operational noise) would provide an effective way to minimise

adverse onshore noise and vibration effects. With respect to operational noise and vibration, the ExA concludes that the Proposed Development complies with NPS-EN1.

- 7.3.22. The ExA has taken into account the inter-related and cumulative adverse effects of construction traffic, construction activities and operational noise at Necton, Cawston, Oulton, North Walsham and Happisburgh, which would significantly affect the daily life of residents and businesses. Overall, the residual noise and vibration effects during construction and operation weigh against making the Order and carry little weight.

Terrestrial Biodiversity, Biological Environment, and Ecology

- 7.3.23. The ExA is content that for terrestrial ecology the Proposed Development would not result in significant adverse effects and that all relevant mitigation is secured appropriately. The only unresolved issue was the need for post-construction monitoring which the RSPB argued was necessary. However, after due consideration of the evidence, the ExA agrees with NE's assessment that post-construction monitoring would not be necessary. In terms of compliance with the requirements of NPS EN-1 and EN-3 the ExA concludes that the Applicant has complied with the requirements in that the Proposed Development aims to avoid significant harm to biodiversity and geological conservation interests, including through mitigation, and has given consideration of reasonable alternatives. There would be no adverse effect on any SSSI and species and habitats that receive statutory protection or have been identified as being of principal importance for the conservation of biodiversity, would be protected from the adverse effects of development by using requirements in the rDCO.
- 7.3.24. Regarding biodiversity net gain, the ExA accepts the Applicant's view that it has complied with current legislation. However, the ExA suggests that the SoS may wish to consider requesting the Applicant to provide net gain, in accordance with requirements in the Environment Bill 2020, in the event that the Order is made.
- 7.3.25. The ExA concludes that matters relating to terrestrial biodiversity, biological environment and ecology do not weigh against the making of the Order.

Water Resources and Flood Risk, Ground Conditions and Contamination

- 7.3.26. The ExA considers that the Proposed Development accords with relevant policy in relation to ground conditions and contamination, surface water drainage and flood risk and the ExA is satisfied that the rDCO provides security for mitigation of potential adverse effects of the Proposed Development to a level that is not significant. In regard to water resources and water quality, the ExA considers that the Proposed Development accords with relevant policy and the WFD and that mitigation for adverse effects is secured in the rDCO; however the ExA

notes that for Scenario 2, significant adverse residual effects on the water environment after mitigation are likely as a consequence of increased sediment supply due to multiple construction activities both for the Proposed Development alone and cumulatively with the Hornsea Project Three OWF (if under construction at the same time) and due to direct disturbance of water bodies in the event of multiple permanent culverts for watercourse crossings being constructed within a river basin sub-catchment.

- 7.3.27. The ExA considers that ground conditions and contamination matters and drainage and flood risk matters do not weigh against the Order being made and that significant adverse effects on water resources weigh against the making of the Order with little weight.

Socio-economic, Land use and Health

Socio-economic

- 7.3.28. The ExA finds the Applicant's assessment of socio-economic effects of the Proposed Development as presented in the ES convincing. The ExA welcomes the inclusion of the Outline Skills and Employment Strategy (OSES) secured through R33 to maximise the benefits for the local economy. The ExA considers that the cumulative beneficial effects in employment are overstated, although this is difficult to quantify precisely. However the ExA still agrees with the Applicant that the effect of the Proposed Development (alone or cumulatively) would be net positive for direct and indirect employment. Moreover, the ExA concludes that there is a compelling case for delivery of new electricity generation infrastructure from renewable sources to deliver social and economic benefits through cost-efficiencies and competitive availability for industrial, commercial and domestic consumers and transport operations. In that regard, the ExA believes that the Proposed Development meets the policy requirements of NPS EN-1. With respect to socio-economic effects, the ExA attributes substantial weight in favour of the making of the Order.

Land use

- 7.3.29. The ExA finds that while the Proposed Development would have an adverse effect on agriculture and farming practices, the proposed mitigation would adequately address the adverse effects. The ExA is also satisfied with the progress made in addressing the disruption to farming at the crossing point with Hornsea Project Three in the OCoCP. In this regard the Proposed Development meets the policy requirement in NPS EN-1. With respect to land use matters discussed here, the ExA attributes little weight against the making of the Order.

Health

- 7.3.30. The ExA is satisfied that the exposure to EMFs for the Proposed Development and cumulatively with Hornsea Project Three OWF would remain within the ICNIRP exposure guidelines, meet the relevant PHE guidance, and comply with NPS EN-5.

- 7.3.31. IPs in the vicinity of the Proposed Development provided heartfelt, qualitative evidence of the negative cumulative impact and stress they foresee during construction, in the event of the Order being made. A concern they feel is exacerbated by the impact of other construction projects such as Norfolk Vanguard OWF and Hornsea Project Three OWF on the locality. The ExA acknowledges these deeply held concerns and is of the view that the inter-related adverse construction stage effects of communities not immediately on the route of the cable corridor, such as Cawston and Oulton, should have been included in the health impact assessment. This would have enabled a fuller understanding of how the quality of life for these communities would be affected during sequential construction activities from the Proposed Development and other projects. The ExA's conclusions in relation to inter-related construction effects are provided later in this chapter.
- 7.3.32. However, at these locations, the ExA notes the Applicant's argument that adverse effects on physical and mental health (such as noise, air quality, traffic, water contamination and employment from impacts to noise, air quality, traffic, water contamination and employment) are considered under separate technical and planning areas and mitigated accordingly. The ExA also notes that the Applicant's scope and methodology follows the World Health Organisation guidance and is agreed with the relevant local authorities. The ExA therefore accepts the Applicant's assessment that the potential health effects would not be significant under either Scenario 1 or Scenario 2; and concludes that the policy requirements of NPS EN-1 are met. Overall, the ExA attributes little weight to health matters against the making of the Order.

Marine Biodiversity, Biological Environment and Ecology

Benthic Ecology

- 7.3.33. The ExA is content that cable protection as described in the rDCO and associated plans may only be deployed during construction and that any new cable protection required during operation would need to be the subject of a separate marine licence application. The ExA accepts that the Applicant has made every effort to reduce the amount of cable protection. However, due to the uncertainties related to sandbank modelling and changes to sediment composition arising from the disposal of dredged material doubt remains whether the sandbanks would fully recover following cable installation. Therefore, the ExA concludes that there could be significant adverse effects from cable protection on benthic ecology.
- 7.3.34. The ExA does not consider there is sufficient scientific evidence to conclude that the impact of disruption to reef features and their ability to recover would not result in a significant adverse effect. The ExA also considers that micro-siting of cables to preclude a loss of the *S. spinulosa* feature may not be possible. The ExA accepts NE's advice that uncertainties remain over whether there would be no adverse effects on

seabed topography, including sand waves, from installation of cables and sand wave levelling.

- 7.3.35. The ExA is content that all sediments would be disposed of within the benthic system and that the overall area of sandbank habitat would not change. The ExA is also content that control of particle size during sediment disposal is adequately secured in the rDCO and the MMO has surety of involvement in the final controls within the PEMP.
- 7.3.36. The ExA concludes that matters relating to benthic ecology have substantial weight against the making of the Order.

Marine mammals

- 7.3.37. Referring to the assessment of noise from piling activities on marine mammals, the ExA concludes that the Applicant has used an appropriate methodology to assess the impacts of noise on harbour porpoises. The ExA is content that mitigation for the effects of piling in relation to permanent auditory injury is secured within the rDCO. Considering the cumulative effects of noise on marine mammals, the ExA has no reason to believe that by the time piling activities for the Proposed Development commence in the South North Sea the Offshore Petroleum Regulator for Environment and Decommissioning activity tracker would not be fully operational and useful for strategically controlling noise activities to protect marine mammals.
- 7.3.38. The ExA concludes that there would be no adverse effects from underwater noise as a result of the Proposed Development alone or cumulatively with other plans or projects, and that the effects on marine mammals has little weight against the making of the Order.

Offshore ornithology

- 7.3.39. The ExA concludes that a significant adverse effect cannot be ruled out for risks of cumulative collision plus displacement of gannet, and cumulative collision for gannet, kittiwake, GBBG, LBBG and herring gull, when the Proposed Development is considered with other plans and projects. This conclusion is arrived at by agreeing with NE's modelling parameters and based on uncertainty in the figures included for the cumulative totals for Hornsea Project Three and Hornsea Project Four OWFs. Similarly, a significant adverse effect cannot be ruled out by the ExA from the risks of displacement of razorbill and guillemot. The ExA concludes for red throated diver that a significant adverse effect cannot be ruled out for cumulative displacement irrespective of inclusion of Hornsea Project Three OWF or Hornsea Project Four OWF.
- 7.3.40. Should the SoS disagree with the ExA's conclusions and satisfy themselves that compensatory measures for the features of the Alde-Ore SPA/Ramsar site the Flamborough and Filey Coast SPA and the Haisborough, Hammond and Winterton SAC are secured, then there would still remain residual significant adverse effects at the EIA scale for:

- a. impact of collision and displacement from the Proposed Development on gannet;
- b. cumulative collision impact for great black-backed gull and herring gull; and
- c. cumulative displacement impact for red throated diver.

7.3.41. The ExA concludes that matters relating to offshore ornithology have substantial weight against the making of the Order.

Policy tests for Marine Biodiversity, Biological Environment and Ecology

7.3.42. With reference to the NPS EN-3 policy tests for offshore ecology which addresses the specific considerations which apply to offshore wind energy the ExA concludes that tests have not been passed for: the specific effects on fish, seabed habitats, marine mammals and birds; and mitigation for subtidal habitat impact through micro-siting, cable burial and limited use of anti-fouling paints While a bird collision risk assessment has been conducted to a satisfactory standard, the results of the assessment do not pass the policy test.

7.3.43. The ExA is content that the NPS EN-3 requirements for the Applicant to undertake ecological monitoring during the construction and operational phases and utilise the results to mitigate impacts and to inform future projects, and to confirm whether any organisation has granted or refused or intends to grant or refuse, any relevant licences, including protected species mitigation licences have been complied with.

7.3.44. Should the SoS disagree with the ExA's findings and satisfy themselves that compensatory measures for the features of the Alde-Ore SPA/Ramsar site the Flamborough and Filey Coast SPA and the Haisborough, Hammond and Winterton SAC are secured, then the ExA still concludes that the NPS EN-3 policy tests for the specific effects on birds and the results of the bird collision risk assessment have not been passed.

7.3.45. Details of changes made to the dDCO are listed in Section 5.9 of this Recommendation Report.

Marine and Coastal Processes

7.3.46. The ExA concludes that the Proposed Development, including the embedded mitigation, would not have a significant adverse effect on marine and coastal processes. While it is acknowledged that the coastline in the vicinity of landfall is actively eroding, the ExA is content that the Proposed Development would not contribute to coastal change in the area during the expected lifetime of the Proposed Development, even taking into account climate change.

7.3.47. In terms of compliance with the requirements of NPS EN-1 and EN-3 the ExA concludes that the Applicant has complied with the requirements. The ExA is content that the Applicant has taken account of the broader context of coastal protection around the Proposed Development and that it would be resilient to coastal erosion and deposition, taking account of

climate change, during the project's operational life and any decommissioning period. Referring to NPS EN-3, the ExA agrees that the Applicant has provided information about alternative landfall sites and alternative cable installation methods which have been considered during the design phase and an explanation for the final choices made.

- 7.3.48. The ExA is also content that the Applicant has had due regard to the appropriate marine policy documents, as provided for in the Marine and Coastal Access Act 2009, and the SMP.
- 7.3.49. The ExA has therefore concluded that effects associated with marine and coastal processes do not weigh against the Order being made.

Commercial Fisheries and Fishing

- 7.3.50. On the evidence presented, the ExA concludes that after mitigation which is secured by the rDCO the impact of the Proposed Development on inshore commercial fisheries and fishing activity would be no greater than minor adverse, and therefore not significant. The rDCO incorporates additional wording requested by TH to secure steps to be taken to ensure safe navigation if any cable protection is identified exceeding 5% of navigable depth.
- 7.3.51. For offshore commercial fisheries and fishing activity the ExA accepts the Applicant's assessment that cumulative residual effects of loss of or restricted access to fishing grounds for Dutch and Anglo-Dutch seine netting and Anglo-Dutch beam trawling would be moderate adverse and therefore significant, whilst likely effects on all other fisheries would be negligible or minor adverse after mitigation secured by the rDCO.
- 7.3.52. However the ExA suggests that the cumulative effects of further offshore development in the North Sea could lead at some point to an aggregated loss of or restricted access to fishing grounds for certain types of fishing activity that would present a strategic planning issue for Government consideration.
- 7.3.53. The ExA has considered the extent to which the Proposed Development would prevent or significantly impede protection of sustainable commercial fisheries and fishing activities during construction or operation and in accordance with NPS EN-3 part 2.6 the ExA attributes corresponding weight against the making of the Order. The ExA concludes that matters relating to commercial fisheries and fishing have little weight against the making of the Order.

Grid Connection

- 7.3.54. The ExA received several representations throughout the Examination making the case for an alternative strategic solution to OWF grid connection. While the ExA has concluded such an alternative cannot be considered within this Examination, there are two points to which the ExA wishes to draw the SoS's attention:

- a. the expressed desire by IPs for legislative changes to overcome obstacles to secondary inter-connection which would allow feeding into local transmission networks; and
- b. the demand for alternative means of grid connection (commonly referred to as an ORM), which would avoid cumulative, sequential onshore adverse effects arising from Associated Development such as radial cable corridors and substations.

7.3.55. With respect to the other matters relating to grid connection brought forward in this Examination, the ExA is satisfied that the Applicant has worked with National Grid to determine and secure the onshore connection point to the national transmission system. As such, the ExA can conclude that the Proposed Development would meet policy requirement of NPS EN-1, NPS EN-3 and NPS EN-5. The ExA concludes that Grid Connection does not weigh against the making of the Order.

Climate Change Adaptation

7.3.56. The ExA is content that for climate change adaptation the Proposed Development would not result in significant harm and that all mitigation is secured appropriately. The ExA is also satisfied that there are no features of the design of the Proposed Development which are critical to its operation which may be seriously affected by more radical changes to the climate beyond that projected in the latest set of UK climate projections over the estimated lifetime of the Proposed Development.

7.3.57. In terms of compliance with the requirements of NPS EN-1 and EN-3, the Climate Change Act 2008 and the Climate Change Act 2008 (2050 Target Amended) Order 2019 Act, the ExA concludes that the Applicant has complied with the requirements. Referring to EN-1, the ExA can confirm that the Applicant has used the latest UK Climate Projections available at the time of close of the Examination.

7.3.58. The ExA concludes that matters in respect of climate change and adaptation do not weigh against the making of the Order.

Cumulative Effects and Inter-relationships

Cumulative effects

7.3.59. There were a number of interested parties who did not agree with the ES conclusions on different aspects of the cumulative effects and/or that the mitigation secured would be adequate. The ExA has reported these earlier and in Chapter 5. The ExA is satisfied that during the Examination additional or different mitigation was proposed and secured by the Applicant to address these matters. In places, the ExA has made additions or changes to the rDCO to address matters where it considers this necessary. The ExA is satisfied that the Proposed Development would comply with the NPS EN-1 in terms of addressing and mitigating cumulative effects.

Inter-related effects on communities

- 7.3.60. The ExA was not persuaded that the Applicant had paid sufficient attention to the potential for accumulation of and inter-relationships between effects which might affect communities as a whole, even if acceptable individually with mitigation in place. This was the case for adverse construction effects at some locations, such as Cawston and Oulton. The ExA examined this further at these two locations. Here, it was a matter of inter-related effects combined with cumulative effects, which it is argued would affect the quality of life of residential receptors in these settlements. The mitigation secured would in part be achieved through the role undertaken by a Community Liaison Officer. In relying on this for mitigation, the ExA makes the point that relations between the Applicant and community representatives appear fraught, as evidenced by submissions at the end of the Examination. Therefore, the ExA is clear that for this mitigation to be effective there must be future collaborative working with the local communities based on shared understanding.
- 7.3.61. There would also be resources required by the local authorities to enact their role in relation to the discharge of the requirements included in the rDCO and for liaison during construction to deal with any escalated complaints. The SoS may wish to satisfy themselves that the local authorities have sufficient capacity to undertake these activities, in the absence of an agreed PPA. Many of those submitting evidence in connection with the cumulative and inter-related adverse construction effects, also expressed a desire for an alternative solution to transmission connection (usually referred to as an ORM). The ExA recognises this is not a matter for this Examination. But, in the absence of an alternative solution in the short to medium term, the ExA notes that the SoS can ensure matters relating to sequential, cumulative onshore inter-related construction effects are adequately addressed through Scoping Opinions for new projects; and also that the BEIS review of the offshore transmission network gives regard to cumulative and inter-related onshore construction effects.
- 7.3.62. The ExA concludes that in certain locations, even with mitigation measures secured for separate topics, the accumulation of inter-related construction effects would adversely affect the quality of life for some communities. The ExA ascribes medium weight to these construction stage inter-related adverse effects (which have also been addressed under construction effects) against the making of the Order.

Other Planning Matters

- 7.3.63. The other planning matters that were considered are: aviation and radar, heritage matters and onshore archaeology, navigation and shipping, offshore archaeology and heritage assets, other offshore infrastructure and waste management. The ExA is satisfied that these matters do not weigh against the Order being made for the reasons set out in Chapter 5.

Transboundary Effects

- 7.3.64. There was no representation from any EEA State during the Examination, other than a RR from Rijkswaterstaat stating its relationship with the Netherlands Government and its areas of special interest. The ExA does acknowledge that there is potential for direct impacts to unknown transboundary heritage assets within the Proposed Development. If artefacts are discovered further advice would be sought in the relevant country of origin regarding the legal status of the remains.
- 7.3.65. The ExA has therefore concluded that transboundary effects do not weigh against the making of the Order.

Habitats Regulations Assessment

- 7.3.66. NPS EN-1 states that, prior to granting a DCO, that the SoS must consider under the Conservation of Habitats and Species Regulations (2010) (Habitat Regulations) Habitats Regulations whether the project may, either alone or in combination with other plans or projects, have a significant effect on a European site or on any site to which the same protection is applied as a matter of policy.
- 7.3.67. The ExA concludes that adverse effects on the integrity of the lesser black-backed gull feature of the Alde-Ore SPA/Ramsar site could not be excluded from the Proposed Development in combination with other OWFs as result of collision related mortality.
- 7.3.68. The ExA concludes that adverse effects on the integrity of the kittiwake, razorbill and guillemot features of the Flamborough and Filey Coast SPA could not be excluded from the Proposed Development in combination with other OWF as a result of collision and displacement related mortality.
- 7.3.69. The ExA concludes that adverse effects on the integrity of the reef and sandbanks slightly covered by sea water all the time features of the HHW SAC could not be excluded for the Proposed Development alone or in combination with other plans or projects as a result of cable installation and protection.
- 7.3.70. The ExA recommends that the SoS concludes that the requirements of Regulation 63 of the Habitats Regulations cannot be met in respect of these sites and features.
- 7.3.71. The ExA recommends that the SoS concludes that these are the only SAC, SPA or Ramsar sites where adverse effects on integrity would arise from the Proposed Development alone or in combination with other plans or projects.
- 7.3.72. The ExA has considered the evidence on potential alternative solutions to delivering the objectives of the Proposed Development and the case for imperative overriding public interest. It recommends that the SoS can conclude that the Proposed Development meets the requirements of Regulation 64 of the Habitats Regulations.

- 7.3.73. The ExA has considered the compensatory measures proposed by the Applicant. However, the compensatory measures proposed by the Applicant have not reached the point of development where the ExA can be confident that the measures would be effective or could be successfully delivered. The ExA recommends that the SoS concludes that the requirement under Regulation 68 of the Habitats Regulations to secure compensatory measures has not been met and therefore consent for the Proposed Development cannot be granted.

7.4. OVERALL FINDINGS AND CONCLUSIONS ON THE CASE FOR DEVELOPMENT CONSENT

- 7.4.1. The ExA has examined the application in accordance with s104(1) of PA2008. This applies to an application for an order granting development consent where an NPS has effect.
- 7.4.2. The ExA can confirm that the application has been examined in the context of s104(2) of PA2008. This requires the SoS to have regard to any relevant NPS. In the case of this application, relevant NPSs are NPS EN-1, NPS EN-3, and NPS EN-5. The ExA has also had regard to section 59 of the Marine and Coastal Act 2009 and the four Local Impact Reports from the relevant local authorities; as well as matters prescribed in relation to development of the description to which the application relates and all other important and relevant matters.
- 7.4.3. The recommendations of the ExA are based on its assessment of the evidence presented through the Examination process including the application documents, the ES, the Local Impact Reports, Statements of Common Ground, Relevant and Written Representations, submissions during the examination at the Hearings, answers to questions and the site visits undertaken by the Panel both accompanied and unaccompanied. All of this evidence is reviewed in the individual topic chapters and considered in the context of the NPSs for Energy (EN-1), Renewable Energy (EN-3) and Electricity Network Infrastructure (EN-5), other policy contained in development plans and marine planning documents.
- 7.4.4. The ExA concludes that the Proposed Development would be in accordance with the overarching principle of the NPPF which seeks to support the transition to a low carbon future in a changing climate taking full account of flood risk and coastal change and supports renewable and low carbon energy and associated infrastructure. The ExA finds that there are no specific policies in the relevant Local Development Plans that indicate the Proposed Development should be refused, restricted, or mitigated further than has been provided for by the rDCO.

Planning Balance

- 7.4.5. The national need for renewable energy NSIPs is a powerful factor weighing in favour of making the Order. With a starting point of the NPS

presumption in favour of granting consent to applications for renewable energy NSIPs, the ExA notes the need case for renewable energy has been strengthened since the NPS designation through amendments to the Climate Change Act setting a target of net zero emissions by 2050 by the UK Government. The ExA also finds that beneficial socio-economic effects including additional employment likely to be forthcoming from the construction and operation/maintenance of the Proposed Development have substantial weight in favour case of making the Order.

- 7.4.6. In making the points below, the ExA has given regard to the SoS decision to make the Norfolk Vanguard OWF Order and the SoS's 'minded to' position on the Hornsea Project Three OWF with regard to cumulative impact.
- 7.4.7. Of greatest concern to the ExA is the adverse effects of the Proposed Development on a range of nationally and internationally designated marine biodiversity, marine biological environment and offshore ecological assets. The level of harm resulting from adverse effects of the Proposed Development on benthic ecology and offshore ornithology is considered by the ExA to warrant substantial weight against the making of the Order.
- 7.4.8. The ExA attributes medium weight against the making of the Order to residual adverse traffic and transport effects; adverse landscape and visual effects; and adverse onshore construction effects including associated inter-related effects; all discussed above and in Chapter 5 of this Recommendation Report.
- 7.4.9. The ExA attributes little weight against the making of the Order to potential adverse effects on commercial fisheries and fishing, good design, health matters, land use, marine mammals, noise and vibration and water resources, all discussed above and in Chapter 5 of this Recommendation Report.
- 7.4.10. The ExA is satisfied that the following matters do not weigh against the making of the Order: aviation and radar; climate change adaptation; grid connection; flood risk; ground conditions and contamination; heritage matters and onshore archaeology; open space and green infrastructure; marine and coastal processes; navigation and shipping; offshore archaeology and heritage assets; other offshore infrastructure; terrestrial biodiversity, terrestrial biological environment and terrestrial ecology; and waste management; all discussed in Chapter 5 of this Recommendation Report.
- 7.4.11. Section 104(3) PA2008 requires the SoS to determine the application in accordance with any relevant NPSs except to the extent that one or more of subsections (4) to (8) applies. The ExA advises that s104(7) of PA2008 is engaged because, for the reasons set out in this Recommendation Report, the ExA concludes that on the planning balance the case for development is not made. In its consideration of the application the ExA has determined that the adverse impact of the Proposed Development would outweigh its benefits. The ExA concludes that the SoS should not

make an Order granting development consent for the Proposed Development.

- 7.4.12. Turning to HRA considerations, the ExA recommends that the SoS should conclude that the requirements under Regulation 63 of the Habitats Regulations for appropriate assessment of sites and features and under Regulation 68 of the Habitats Regulations to secure compensatory measures have not been met.
- 7.4.13. Should the SoS disagree with the ExA's findings then the SoS should satisfy themselves that compensatory measures identified in Chapter 6 for the features of the Alde-Ore SPA/Ramsar site the Flamborough and Filey Coast SPA and the Haisborough, Hammond and Winterton SAC are secured.
- 7.4.14. The SoS may also wish to satisfy themselves that the relevant local authorities are sufficiently equipped to enact their prescribed role in relation to the discharge of post-consent requirements when considering these conclusions with respect to the Case for Development.

8. COMPULSORY ACQUISITION AND RELATED MATTERS

8.1. INTRODUCTION

- 8.1.1. This Chapter examines compulsory acquisition (CA) of land, rights over land and related matters including temporary possession (TP).
- 8.1.2. For reasons stated in Chapter 7, the ExA concludes that the case for development is not made and the ExA is unable to recommend that development consent is granted.
- 8.1.3. The case for compulsory acquisition depends upon the public benefits flowing from the scheme, which cannot be realised in the absence of development consent. It follows that, without a recommendation that consent be granted, the case for compulsory acquisition cannot be made out. Nevertheless, we are mindful of the fact that the SoS may conclude differently. This Chapter considers CA matters in the event that the SoS is minded to grant development consent.
- 8.1.4. This Chapter is organised as follows:
 - a. The request for CA and related powers;
 - b. The purpose for which powers are sought;
 - c. The requirements of PA2008;
 - d. Examination of the case of CA and TP; and
 - e. Conclusions.

8.2. THE REQUEST FOR CA AND RELATED POWERS

- 8.2.1. The scheme which is the subject of the application, referred to as the Proposed Development, is described in Chapter 1 of this Recommendation Report.
- 8.2.2. A Book of Reference (BoR) and Statement of Reasons (SoR) [APP-026; APP-024] were provided and revised during the Examination, provided in final form at [REP18-015] and [REP5-006].
- 8.2.3. A Funding Statement was also submitted with the application, but not updated during the Examination [APP-025].
- 8.2.4. The Explanatory Memorandum provides details as to the purpose of each Article, including reference to previously made Orders that the Applicant considers to be applicable to this application. This was updated during the Examination with the final Explanatory Memorandum including, in response to ExA questions, a separate Annex explaining how it addresses the points set out in Planning Inspectorate Advice Note 15, submitted at the end of the Examination [REP18-012].

- 8.2.5. The Applicant is seeking the acquisition of a combination of freehold ownership, permanent rights (such as rights of access, repair and maintenance) and temporary possession and rights [REP5-006].
- 8.2.6. The SoR states that the request for CA and related powers is to “*secure the land and rights required to construct and then operate the Project within a reasonable commercial timeframe*” [REP5-006, para 2.12]. The SoR sets out the more detailed purpose for each plot within the Order limits, by relating those plots to specific works by Works number.
- 8.2.7. The Applicant explains that the Order Land in the BoR is required “*either for the purposes of the project, to facilitate the same or for purposes incidental thereto*” and that it is seeking the acquisition of “*a combination of freehold ownership, permanent new rights and temporary rights during construction*” [REP5-006].
- 8.2.8. The Applicant refers to the tests set in legislation and in guidance for CA, confirming that it would seek to acquire rights and interests by agreement where possible. Notwithstanding this approach, the Applicant intends to retain the land in the BoR:
- “...to ensure that, if any minor interests such as easements, rights of way, restrictive covenants or similar interests are discovered that have not previously been negotiated away, powers are available to override those interests. It also reflects that minor interests may still be outstanding and not waived and therefore have to be extinguished or overridden by the available statutory process. In such circumstances a relevant claim may be made and accordingly scheduling of the interests in land is necessary.”* [REP5-006, para 2.11]
- 8.2.9. The BoR identifies all the plots of land required, shown on the Land Plans comprising 41 sheets including three sheets which provide an overview of both Scenario 1 and Scenario 2. Plots are numbered consecutively by reference to each individual Land Plan. The BoR sets out the type of interest sought under each scenario for each plot.
- 8.2.10. For reasons set out previously in this Recommendation Report, the Applicant is seeking development consent for two different scenarios:
- Scenario 1: Norfolk Vanguard and the Proposed Development are both delivered (with associated infrastructure), and Norfolk Vanguard installs ducts and carries out other shared enabling works to benefit the Proposed Development.
 - Scenario 2: only the Proposed Development is delivered; Norfolk Vanguard does not proceed to construction and the Project proceeds alone. The Proposed Development undertakes all works required as an independent project.
- 8.2.11. The details of the powers sought in order to implement the required CA, including interference with third party rights and also the related TP of land and other compulsory purchase powers, are set out in Part 5, Articles 18 to 30 of the dDCO [REP18-009].

- 8.2.12. A number of changes were made to the drafting of these Articles during the course of the Examination. Most changes are considered by the ExA to be minor drafting amendments only. The two exceptions to this relate to Article 26: Temporary use of land for carrying out the authorised project and Article 27: Temporary use of land for maintaining the authorised project. Both are discussed later in this Chapter.
- 8.2.13. Restrictive covenants are sought over land in which the ducts, transmission cables and fibre optic cables would be installed, in order to ensure apparatus would not be damaged by construction or excavation works or made materially more difficult to access in case of emergency or routine works to the cables, fibre optic cables and ducts being necessary. The Applicant argues that this is a justifiable use of compulsory acquisition powers to protect the Proposed Development and to give the Applicant and its successors (including any successor offshore transmission network operator) the comfort that the cables, fibre optic cables and ducts would be appropriately protected and the transmission of electricity would not be interrupted by such excavation [APP-024]. The Applicant confirms that restrictive covenants are not sought over areas that are owned or used by statutory undertakers or highway lands [APP-024].
- 8.2.14. The Applicant considers the use of powers of compulsory acquisition are “*entirely necessary and proportionate to the extent that interference with private rights is required*” [REP5-045, para 7.34].

8.3. THE PURPOSES FOR WHICH POWERS ARE SOUGHT

- 8.3.1. The application documents include details of the onshore land shown on Part 2 of the Land Plans (Part 1 providing details of offshore land) [APP-008]; the Special Category Land Plan [APP-009]; and Part 2 of the Crown Land Plan [APP-017]. The works for which the land is required is shown on the Works Plans [APP-010], which were updated during the Examination with final version [REP14-002] to [REP14-005], and the Access to Works Plan [APP-011].
- 8.3.2. After the application was accepted for examination, the Planning Inspectorate issued s51 advice in relation to errors and omissions in the Land Plans. The changes subsequently made to the Land Plans are set out in the Applicant’s letter [AS-001]. These were accepted at the discretion of the ExA. The updated Land Plans were as follows:
- Land Plans Part 1 [AS-006];
 - Land Plans Part 2 [AS-007];
 - Land Plans Part 3 [AS-008];
 - Land Plans Part 4 [AS-009];
 - Land Plans Part 5 [AS-010]; and
 - Special Category Land Plans [AS-011].
- 8.3.3. There was a further revision of the Land Plans (Version 3) at D9 [REP9-003] to [REP9-008] to reflect an update at the Land Registry in relation

to a previous title which was split into two titles, discussed later in this Chapter.

- 8.3.4. Final versions of the onshore Land Plans for certification as part of the dDCO were provided at D18 as follows:
- Land Plans Part 1 of 6 (version 4) REP18-003;
 - Land Plans Part 2 of 6 (version 4) REP18-004;
 - Land Plans Part 3 of 6 (version 4) REP18-005;
 - Land Plans Part 4 of 6 (version 4) REP18-006;
 - Land Plans Part 5 of 6 (version 4) REP18-007; and
 - Land Plans Part 6 of 6 (version 4) REP18-008.
- 8.3.5. Scenario 1 and Scenario 2 would each result in different land use requirements as set out in the SoR [REP5-045, paras 7.9.35 to 7.9.57]. The Land Plans and Works Plans identify the separate uses and powers requested for the two scenarios.
- 8.3.6. The introduction to the BoR sets out the powers sought in relation to Scenario 1 and Scenario 2 [REP18-016]. The Legend in the Land Plans illustrates how the land interests are differentiated through use of colour and hatching [REP18-003 et seq].
- 8.3.7. The BoR sets out in detail nine types of land under which land and rights may be acquired permanently or possessed temporarily [REP18-016]. These are:
- Type 1: Land not required under Scenario 1 (as described in the Statement of Reasons);
 - Type 2: Land not required under Scenario 2 (as described in the Statement of Reasons);
 - Type 3: Permanent rights under Scenario 1, Permanent freehold acquisition under Scenario 2;
 - Type 4: Permanent rights under Scenario 1, Access only under Scenario 2;
 - Type 5: Permanent freehold acquisition under Scenario 1, Permanent rights under Scenario 2;
 - Type 6: Temporary Rights under Scenario 1, Permanent freehold acquisition under Scenario 2
 - Type 7: Temporary Rights under Scenario 1, Permanent rights under Scenario 2;
 - Type 8: Permanent rights under Scenario 1, Temporary Rights under Scenario 2; and
 - Type 9: Access only under Scenario 1, Permanent rights under Scenario 2.
- 8.3.8. The SoR provides the justification for the use of powers. Section 7 lists land where freehold title is sought under Scenario 1 and Scenario 2 at paragraph 7.8 [REP5-006].
- 8.3.9. The SoR also sets out the principal rights sought for cable installation in Section 7. Permanent new rights are sought to permit the Applicant to install ducting, fibre optic cables and cables for the Proposed

Development and to facilitate access for installation and for maintenance of the onshore infrastructure and associated works. The SoR explains that this is the principal type of acquisition proposed for the majority of the Order Lands, comprising the onshore cable route and associated rights of access. The Applicant anticipates that the process to secure permanent rights compulsorily would commence only after TP had first been taken of the surface and subsoil of the relevant Order Lands, and construction of the relevant part of the Proposed Development was complete [REP5-006].

- 8.3.10. For some plots cable installation would not be required (as the cables and ducts would not need to be installed in these plots) but a right to access the onshore cable route would be necessary. For the most part this would be along existing routes. The Applicant explains that it has taken account of the location of existing farm gates and entrances to select entry points to the cable route easement from the public highway. There are some points where temporary running tracks would be required to facilitate cable pulling. Whilst the running track would be temporary in duration, the right of access sought is a permanent right over land to allow the Applicant or its successors to use the same route for occasional maintenance during the Proposed Development's operational period, as well as to secure a route for decommissioning activities. This includes both the right to improve existing access routes and to lay down hard standing [REP5-006, para 7.8.3].
- 8.3.11. The SoR also includes at Section 7 details of miscellaneous rights sought, restrictive covenants and rights for overhead line alterations where National Grid Electricity Transmission (NGET) apparatus is to be retained but altered in the event of Scenario 2 [REP5-006].

Special Category Land, Statutory Undertakers' Land and Electronic Communications Code Operators

- 8.3.12. The application includes areas of Crown Land, National Trust land, land owned by Highways England and Open Space land. All land is identified, described and illustrated in the BoR and is discussed later in this chapter.
- 8.3.13. Powers are also sought to acquire land, interfere with interests, override interests and remove apparatus in relation to Statutory Undertakers land and electronic communications code operators. These are set out in the SoR and are discussed later in this Chapter.

8.4. THE REQUIREMENTS OF PA 2008

- 8.4.1. CA powers can only be granted if the conditions set out in s122 and s123 of PA2008 are met.
- 8.4.2. Section 122(2) requires that the land must be required for the development to which the development consent relates or is required to facilitate or is incidental to the development. In respect of land required

for the development, the land to be taken must be no more than is reasonably required and be proportionate. A conclusion on this matter is reached at the end of this section.

- 8.4.3. Section 122(3) requires that there must be a compelling case in the public interest which means that the public benefit derived from the CA must outweigh the private loss that would be suffered by those whose land is affected. In balancing public interest against private loss, CA must be justified in its own right. This does not mean however that the CA proposal can be considered in isolation from the wider consideration of the merits of the Proposed Development. There must be a need for the Proposed Development to be carried out, and there must be consistency and coherency in the decision-making process. A conclusion on this matter is reached later in this Chapter.
- 8.4.4. Section 123 requires that one of three conditions must be met by the proposal. The ExA is satisfied that the condition in s123(2) is met, because the application for the Order included a request for CA of the land to be authorised.
- 8.4.5. A number of general considerations also have to be addressed either as a result of following applicable guidance or in accordance with legal duties on decision-makers:
- all reasonable alternatives to CA must be explored;
 - the Applicant must have a clear idea of how it intends to use the land and to demonstrate funds are available; and
 - the decision-maker must be satisfied that the purposes stated for the acquisition are legitimate and sufficiently justify the inevitable interference with the human rights of those affected.

8.5. HOW THE ExA EXAMINED THE CASE FOR CA (AND TP)

- 8.5.1. The ExA examined the case for CA through:
- a. identifying CA, including issues related to the justification for the powers sought, as a principal issue [PD-006];
 - b. specific questions on CA in the first round of written questions (WQ1) issued on 19 November 2019 including a request to complete and keep updated columns 7 to 11 of the Compulsory Acquisition Objections Schedule (CAOS) attached as Annex A to the written questions [PD-008, Q3.0.1 to Q3.0.3];
 - c. specific questions on CA and drafting of CA Articles in the dDCO in WQ2 issued on 12 February 2020 [PD-009, Q2.3.0.1 to Q2.3.0.36] and [PD-009, Q2.5.1.6 to Q2.5.1.8];
 - d. in March 2020 the ExA's detailed agenda for a Compulsory Acquisition Hearing on 18 March was published [EV10-001]. The Compulsory Acquisition Hearing was cancelled due to the coronavirus pandemic;

- e. a Rule 17 request was subsequently issued translating the matters raised in the published agenda into third and fourth round written questions [PD-012] and [PD-016];
- f. specific questions on CA in the WQ3 issued on 23 March 2020 [PD-014, questions Q3.3.0.1 to Q3.3.0.26];
- g. specific questions on CA in WQ4 issued on 28 April 2020 [PD-016, Q4.3.0.1 to Q4.3.0.18];
- h. a request for an updated CAOS in WQ5 issued on 11 August 2020 [PD-022];
- i. a Rule 17 request on 18 August 2020 seeking clarification of matters relating to Mid-Norfolk Railway Preservation Trust [PD-023];
- j. a Rule 17 request on 10 September 2020 seeking further details in relation to representations from objectors where HoTs had not been agreed with the Applicant [PD-025]; and
- k. a request for a final CAOS at the end of the Examination [REP18-028].

8.6. CONSIDERATION OF REASONABLE ALTERNATIVES TO CA

- 8.6.1. Paragraph 8 of DCLG CA Guidance states that the applicant should be able to demonstrate that all reasonable alternatives to CA (including modifications to the scheme) have been explored.
- 8.6.2. The Applicant has considered the alternatives to CA in the SoR [REP5-006, paras 7.22 to 7.24]. It refers to the detail of the ES including reasons for the choice of landfall, onshore cable route and substation location. The SoR states that the land scheduled in the BoR is necessary and appropriate and that there are no other suitable alternatives. The SoR also confirms that the Applicant has sought and continues to seek a negotiated solution to each of the identified required interests and that these negotiations would continue.
- 8.6.3. The Applicant's assessment of alternative options during the development of the Application was informed by economic, environmental and other factors and the outcome of consultation. This is discussed in Chapters 4 and 5 of this Recommendation Report.
- 8.6.4. The SoR also explains how and why the Applicant believes it has demonstrated that reasonable alternatives to CA have been explored.

8.7. TEMPORARY POSSESSION

- 8.7.1. The Applicant is also seeking TP powers to facilitate the works required to implement the Proposed Development.
- 8.7.2. The Applicant's case for the use of TP powers is set out in the SoR and given effect in the draft Order through Articles 26 and 27.

- 8.7.3. The SoR explains that Powers of TP of land are sought for two reasons. Firstly, where activities would be carried out during construction or where construction equipment and other apparatus would need to be laid down but no cables or other apparatus are proposed to be installed. Here the dDCO would permit the Applicant to take possession of this land temporarily without the need for powers of CA. Schedule 8 of the Order, Part 1 in the event of Scenario 1, Part 2 in the event of Scenario 2, lists the plots scheduled for TP only [APP-024].
- 8.7.4. The second occasion when powers of TP are sought are to enable construction activities on the land where cables, fibre optic cables and ducts are to be installed, prior to any permanent rights to retain, operate, and maintain those cables, fibre optic cables and ducts being acquired compulsorily (or by agreement). The purpose of this second use is to allow the Applicant to complete the cable, fibre optic cables and duct installation works, including any micro-siting of apparatus within the land, before committing to acquiring permanent rights. This is intended to reduce the amount of land affected by permanent rights, and accordingly reduce the impact on landowners [APP-024].
- 8.7.5. The Applicant confirms that Schedule 8, Part 1 in the event of Scenario 1 and Part 2 in the event of Scenario 2, lists the plots scheduled for TP only.
- 8.7.6. Restrictive covenants are sought over land which would have cables and ducts installed, to protect the cables or ducts from exposure or damage or being built over. Restrictive covenants are not sought over areas that are owned or used by statutory undertakers or highway lands.

8.8. AVAILABILITY AND ADEQUACY OF FUNDING

- 8.8.1. In considering the adequacy of funding, the ExA had regard to NPS EN-1, para 4.1.9, and to DCLG CA Guidance in particular paragraph 9 in which an applicant should be able to demonstrate that there is a reasonable prospect of the requisite funds for acquisition becoming available; and paragraphs 17 and 18 which refer to resource implications of a proposed scheme.
- 8.8.2. The application documents included a six-page Funding Statement, along with three Annexes setting out Accounts for Vattenfall Wind Power Limited 2016-2017; Accounts for Vattenfall AB (the Parent Company) 2017-2018 and a proposed Funding Agreement [APP-025].
- 8.8.3. The adequacy, source and availability of the funding required for both acquiring the land and implementing the Proposed Development for which the land is required was addressed in the ExA's WQ2, WQ3 and WQ4.

The funding required for implementing the Proposed Development

- 8.8.4. Issues surrounding the funding required for implementing the Proposed Development were primarily examined through the ExA's WQ2 [PD-009, in particular, Q2.3.0.1 to Q2.3.0.8].
- 8.8.5. The Applicant explained that its broad estimates of the cost are based on the Applicant's parent company's (Vattenfall Wind Power Ltd) experience of constructing offshore windfarms (OWFs) in the UK and European waters and on early commercially confidential negotiations for the delivery of the Proposed Development [REP5-045, Q2.3.0.6].
- 8.8.6. The principal capital expenditure costs set out by the Applicant are firstly, the provision of combined goods and services to deliver an operational 1.8GW High Voltage Direct Current (HVDC) export infrastructure comprising two onshore HVDC/ High Voltage Alternating Current (HVAC) convertors; all necessary onshore and offshore HVDC transmission cables; two offshore platforms each for an HVDC/AC convertor; and all necessary metering and switch gear, estimated by the Applicant to be approximately £1 billion. Secondly, the cost of the provision of combined goods and services to deliver an operational 1.8GW OWF (comprising wind turbine generators (WTGs), foundations and platforms, and interconnecting HVAC array cables) estimated by the Applicant to be approximately £3 billion [REP5-045, Q2.3.0.6].
- 8.8.7. The Applicant stated that in addition to the capital costs above there would also be costs associated with setting up the operations and maintenance facilities, undertaking preconstruction surveys and project management costs. These are estimated to be approximately £500 million [REP5-045, Q2.3.0.6]. In total, the cost of constructing the proposed development estimated by the Applicant is £4.5billion [REP5-045, Q2.3.0.6].

Source of funding for implementing the Proposed Development

- 8.8.8. The ExA explored whether the Applicant had potential access to such a level of resources. The Funding Statement sets out the position [APP-025]. It explains that the Applicant is a company created specifically for promoting, developing, constructing and operating the proposed OWF for which the Order is sought, that it is a wholly owned subsidiary of Vattenfall Wind Power Ltd (VWPL) and that the Applicant is defined in the Order as 'the undertaker' and would be the corporate body invested with the powers provided for in the Order [APP-025].
- 8.8.9. The Funding Statement includes an explanation of the relationship between the Applicant, VWPL and the Vattenfall Group. The ultimate parent company of VWPL, Vattenfall AB (the Parent Company), is owned by the Swedish state and would provide collateral or security to the Applicant under the terms of the Agreement provided with the application [APP-025].
- 8.8.10. The Applicant provides financial accounts of VWPL and the Parent Company at Annex 1 and 2 of the Funding Statement. For the year

ended December 2017, the balance sheet of VWPL states net assets of £898,966,000 [APP-025, Annex 1]. The financial results of VWPL are included in the consolidated financial statements of Vattenfall AB, the Parent Company. For the year ended December 2018, the consolidated balance sheet of the Parent Company stated total assets of approximately £36,853 million (converted at the date of application from 462,608 Swedish krona (SEK), of which total current assets were stated as 126,647 million SEK; total equity was stated as 103,597 million SEK) [APP-025, Annex 1]

- 8.8.11. The Applicant provides consolidated accounts of VWPL and the Parent Company at Annex 1 and 2 of the Funding Statement. For the year ended December 2017, VWPL states total fixed assets of £270,162,000. For the year ended December 2018, the Parent Company states total fixed assets approximately £36,853 million.
- 8.8.12. During the Examination, the ExA requested up to date financial accounts for VWPL and the Parent Company [PD-009, Q2.3.0.1; Q2.3.0.02]. Accounts for the Applicant and for VWPL were provided for the year ended December 2018, and the balance sheet for VWPL states net assets of £969,675,000 [REP5-046]. The financial results of VWPL are included in the consolidated financial statements of Vattenfall AB, the Parent Company, stated as VWPL's controlling party and ultimate parent undertaking.
- 8.8.13. The Applicant explains that it would only secure funding for the Proposed Development if the Order was granted; tendering for major construction contracts was completed and the investment case had been satisfied. Should these criteria be met, then a Final Investment Decision would be taken that would irrevocably commit funding.
- 8.8.14. The Applicant asserts that given the substantial assets of VWPL and the Parent Company and its experience, funds would be available for:
- the cost of the Proposed Development;
 - the cost of acquiring the land identified in the Order; and
 - the cost of compensation otherwise payable in accordance with the Order.

Adequacy of Funds for CA

- 8.8.15. The Funding Statement did not contain an indication of the amount of funding that would be required for CA. Following ExA written questions, in particular Q2.3.0.7 [PD-009], the Applicant confirmed that the costs of CA had been estimated. It set out the assumptions on which that estimate had been based, but argued that due to commercial sensitivity, it did not wish to disclose specific values [REP7-015].
- 8.8.16. A draft Funding Agreement between the Applicant and Vattenfall AB was included at Annex 3 of the Funding Statement [APP-025]. The ExA requested a final, signed version of the Agreement, if the ExA were to give weight to it in its consideration of the application [PD-009, Q2.3.0.4]. This was submitted in March 2020.

- 8.8.17. At the 'virtual hearing' ISH5 into the draft DCO and other matters held on 24 July, the ExA queried the validity of the deed given the absence of a witness signature from the Agreement [EV14-004]. The Applicant confirmed that it was not necessary for the reasons set out in [REP13-017]. The ExA is satisfied with this response.

Conclusion on funding required for CA and TP

- 8.8.18. In relation to the funding of the implementation of the Proposed Development, the ExA is satisfied that there is security of funding for the implementation of the Proposed Development. However, the SoS may wish to obtain and consider the 2019 accounts for VWPL and the Parent Company plus a statement of any material changes in the ownership structure of the Applicant, VWPL and the Parent Company that have taken place since the publication of the last accounts, including effects of the coronavirus pandemic on the Vattenfall business, share price and ability to raise funds.
- 8.8.19. The Applicant has provided the assumptions upon which the costs of CA have been estimated as well as providing assurance that the Parent Company would fund 100% of compensation and costs of the acquisition of the Specified Third Party Interests on the terms of this Deed in the event of Norfolk Boreas Limited failing to settle a claim following it being agreed or determined by the Lands Tribunal [REP7-015].
- 8.8.20. The signed Funding Agreement with the Parent Company provides some certainty about funding for CA liabilities should the Order be made. However, as the Applicant did not disclose specific values due to commercial sensitivity, the SoS would need to satisfy themselves on this matter. The SoS may also wish to be satisfied that prior to the granting of any CA powers, the requisite funding has been secured by the Applicant and would be available to enable CA within the statutory period following the Order being made.

8.9. COMPELLING CASE IN THE PUBLIC INTEREST FOR COMPULSORY ACQUISITION s122(3)

- 8.9.1. Section 7 of the SoR sets out why the Applicant considers there is a compelling case in the public interest for powers of CA. The Applicant states that the Proposed Development would contribute to the national demand for generation of power using renewable energy.
- 8.9.2. The Applicant confirms it has sought, and would continue to seek, to negotiate acquisition of interests where possible by voluntary agreement and is seeking appropriate powers to ensure that the Proposed Development could be brought forward in a reasonable and commercial time frame.
- 8.9.3. The Applicant also states that it has a well worked up scheme and funding sufficient to take the Proposed Development forward.

- 8.9.4. In summary the Applicant considers the Proposed Development to be:
- in accordance with established and emerging national policy in relation to NSIPs contained in NPS EN-1, NPS EN-3 and NPS EN-5;
 - required to meet a pressing national need for electricity generating capacity; and
 - entirely necessary and proportionate to the extent that interference with private rights is required.

8.10. HUMAN RIGHTS

- 8.10.1. Section 8 of the SoR sets out the Applicant's case in respect of the Human Rights Act 1988. The Applicant acknowledges that the Order has the potential to infringe the human rights of persons who hold interests in the Order Land, adding that "*...such infringement can be authorised by law provided the appropriate statutory procedures for making the Order are followed and there is made out a compelling case in the public interest for the compulsory acquisition and the interference with the Convention Right I proportionate. On the basis of decisions of the courts, the test of proportionality is satisfied if the Order strikes a fair balance between the public benefit sought and the interference with the rights in question*" [REP5-006, para 8.54].
- 8.10.2. In order to demonstrate that CA or TP is justified, the Applicant has also considered Articles 1, 6 and 8 of the First Protocol of the Convention on Human Rights.
- 8.10.3. In relation to Article 1, the Applicant refers to the right to compensation as being an important factor in considering "*the balance between demands of the general interest of the community and the requirements of the protection of the individual's fundamental rights*". Where new rights are being sought, the Applicant considers that whilst there would be an effect on those who remain in occupation for the duration of the works, this would be temporary, and they would be entitled to make a compensation claim. Those affected by compulsory acquisition would be permitted to claim compensation in accordance with the Statutory Compensation Code and the Applicant confirms that its ultimate parent company has the resources to provide such compensation.
- 8.10.4. The Applicant summarises its position in the following manner: "*The requirements of compensation being payable for the acquisition of any interest are met. Therefore Article 1 of Protocol 1 is not contravened.*"
- 8.10.5. In so far as Article 6 is concerned, the Applicant argues that "*all scheduled interests are able to make representations to the Examining Authority and therefore the requirements of Article 6 are met*".
- 8.10.6. The Applicant acknowledges that a right protected by Article 8 would be interfered with as a result of CA or TP powers being included in the Order. In its view the interference would be in accordance with the law "*there being a legal basis for seeking compulsory acquisition in the*

Order, pursuant to promoting a Nationally Significant Infrastructure Project”.

- 8.10.7. The Applicant adds that it considers the interference would be in pursuit of the legitimate aim of delivery of the Proposed Development. The Applicant also believes the interference is necessary in a democratic society balancing the public interest and the rights of the individual.
- 8.10.8. In summary, the Applicant concludes that in its opinion, “*the significant public benefits on balance outweigh the effects upon persons who own property and rights within the Order Land*” [REP5-006]. For the reasons set out, the Applicant considers that the inclusion of powers of CA and related matters within the DCO in respect of land and rights as set out in the BoR and shown on the Land Plans is justified.

8.11. THE EQUALITY ACT 2010

- 8.11.1. Section 149 of the Equality Act requires a public authority, in the exercise of its functions, to: have due regard to the need to eliminate discrimination harassment and victimisation and any other conduct prohibited by or under the Act; advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it; and foster good relations between persons who share a relevant protected characteristic and persons who do not share it. The protected characteristics are: age; gender; gender reassignment; disability; pregnancy and maternity; religion and belief; and race.
- 8.11.2. The ExA is content that no evidence in the Examination suggested that the Proposed Development would have any specific impact in relation to persons who share a protected characteristic as compared to persons who do not, nor any indication that allowing the Proposed Development would have any harmful equality implications.

8.12. THE DEVELOPMENT CONSENT ORDER

- 8.12.1. Part 5, Articles 18 to 30 of the dDCO set out the Powers of Acquisition sought by the Applicant [REP18-009]. With reference to Article 26, there was sustained disagreement between the Applicant and the NFU over timing of notice before entering land to take TP. The Applicant proposed 14 days whilst NFU proposed 28 days. The ExA recommends 28 days for the reasons set out in Section 5.8 of this Recommendation Report. This change is included in Article 26 of the rDCO.
- 8.12.2. With reference to Article 27, a change to the drafting has been proposed by the Applicant to identify that the period in relation to the maintenance of landscaping in the district of North Norfolk District Council (NNDC) is different to the maintenance period in relation to any other part of the authorised project.

- 8.12.3. This position seeking to secure temporary rights for maintenance of trees, hedges and shrubs for 10 years in the District was agreed with NNDC. Temporary powers are proposed to avoid the undertaker using permanent rights unnecessarily. The ExA agrees for the reasons set out in Section 5.3. The ExA is content with the drafting of Article 27 and includes this in the rDCO.
- 8.12.4. Although no changes are proposed to the drafting of Article 24: Acquisition of subsoil or airspace, the ExA asked the Applicant to identify, through means of a schedule, the plots which would be affected by the two Articles [PD-008]. The Applicant explained it considered Article 24 necessary over the entirety of the Order land, appropriate in the context of subsoil for cables to be laid underground and in the context of subsoil and airspace for electricity lines to be installed overhead where the entire freehold interest may not be required [REP5-045].
- 8.12.5. The ExA asked the Applicant to explain why Article 24 should apply to the entirety of the Order Land particularly given that overhead electricity lines and the laying of cables would not extend throughout the Order land [PD-014]. In response the Applicant argued for flexibility, stating it would not be seeking both of these rights over the entirety of the Order Land and that it would primarily be seeking subsoil rights for the cable route. The Applicant also argued that the Article would protect a landowner by limiting the strata of an interest to be acquired to that actually needed (instead of acquiring the whole of the land) – enabling the ownership of the unrequired elements to remain with the landowner [REP7-017].
- 8.12.6. With this further explanation, the ExA is content with the drafting of Article 24.
- 8.12.7. Eight new parcels of land were created as a result of a subdivision of ownership. The Applicant advises that this was to reflect an update at the Land Registry in relation to a previous title (identified on sheet 41 of the Land Plans) which had been split into two titles. Originally the land owned by Dudgeon Offshore Wind Limited was registered under title NK440779; following a transfer of certain parts of this title to their OFTO organisation, a portion of the land is now registered under an additional title NK486551.
- 8.12.8. The new parcels are 41/06c, 41/09a, 41/09b, 41/14d, 41/14e, 41/15a, 41/17a, 41/18a and 41/20a; and the area of the original parcels (being 41/09, 41/14, 41/15, 41/17, 41/18 and 41/20) have been reduced by the same extent as the areas of the new parcels from which they have been created.
- 8.12.9. The Applicant confirmed that the Order Limits were not affected by this subdivision. The new plots are identified on Sheet 41[REP9-008]. The ExA is satisfied that the subdivision of ownership and creation of eight new parcels have been accurately reflected in the BoR and are included in the rDCO.

8.13. COMPULSORY ACQUISITION OBJECTIONS SCHEDULE (CAOS)

- 8.13.1. To assist in monitoring the progress of negotiations between the Applicant and objectors, the ExA drew together all objections into a CAOS which it requested the Applicant to keep up to date. The Applicant submitted regular updates of the CAOS, prior to its final form submission at the end of the Examination [REP18-028].
- 8.13.2. In summary, the CAOS identifies:
- a. whether or not the objector holds a Freehold interest and/or is an Occupier of land within the Order limits;
 - b. if the objector does hold an interest in the Order land, what powers are sought by the Applicant;
 - c. whether the powers sought by the Applicant are permanent or temporary;
 - d. the details of the individual plots and whether the plots would be affected in Scenario 1, Scenario 2 or in both scenarios;
 - e. whether the objection is a CA objection; and
 - f. what the status of the objection is, in relation to the Applicant's responses and the outcome of its ongoing negotiations.
- 8.13.3. The ExA has updated a number of entries in the CAOS to provide further detail in relation to Examination Library references and plot details as shown in the final form BoR [REP18-015]. The ExA's amended COAS is at Appendix C of this Recommendation Report.

8.14. SPECIAL CATEGORY LAND

The case in relation to Crown Land (s135)

- 8.14.1. Crown Land is identified in the BoR and on the Crown Land Plan [APP-017] as land below the mean low water mark at the landfall at Happisburgh South, North Norfolk (Plots 01/01, 01/02, 01/03, 01/17 and 01/19).
- 8.14.2. s135 states that:
- "(1) An order granting development consent may include provision authorising the compulsory acquisition of an interest in Crown land only if:*
- "(a) it is an interest which is for the time being held otherwise than by or on behalf of the Crown, and*
- "(b) the appropriate Crown authority consents to the acquisition.*

"(2) An order granting development consent may include any other provision applying in relation to Crown land, or rights benefiting the Crown, only if the appropriate Crown authority consents to the inclusion of the provision."

- 8.14.3. The Crown's interest cannot be acquired compulsorily, but an interest in land held otherwise than by or on behalf of the Crown may be acquired with the agreement of the appropriate body.
- 8.14.4. The Crown Estate confirmed its consent [REP10-73] to Articles 3, 5, 6, 7(2), 16, 26, 27, 31, 32, 33, 34, 40, and 42 of the dDCO, to the extent that they are included in the Order, applying in relation to Plots 01/01, 01/02, 01/03, 01/17 and 01/19 for the purpose of section 135(2) of the Act; and Article 12(1)(b) but only in relation to Work No 4B as defined in Part I of Schedule 1 to the dDCO subject to:
- *"the inclusion and continuing application of Article 42 "Crown Rights" wording in the rDCO and*
 - *that the Commissioners should be consulted further if any variation to the draft DCO was proposed that could affect any other provisions of the Order subject to s135 of the Act"* [REP10-073].
- 8.14.5. The Crown Estate is identified as Objector 10 in the CAOS [REP18-028]. The CAOS records the agreement reached between the Crown Estate and the Applicant for the exercise of CA powers over third party interests in Crown land forming part of the Crown Estate. It confirms that the Crown Estate has provided consent for the CA of the third party interests in the relevant plots for the purpose of section 135(1) of the Planning Act 2008 and their consent to the provisions of the DCO for the purpose of section 135(2) of the 2008 Act.
- 8.14.6. The ExA notes that the wording of Article 42 remains identical in the dDCO to that agreed by the Crown Estate. The ExA is also satisfied that no changes were made to the dDCO between receipt of the Crown Estate's response at D10 and the close of the Examination that could affect any other provision of the Order subject to s135 of the Act.
- 8.14.7. The ExA has considered the statutory position set out in s135 of PA 2008 and has had regard to DCLG CA Guidance in particular, paragraphs 39 and 40 of Annex B. The ExA is satisfied that the representation from the Crown Estate constitutes consent and that the test in s135 of PA2008 is met.

The case in relation to National Trust land (s130)

- 8.14.8. National Trust Land and Interests are identified on the Special Category Land Plan [AS-011] and located in the Blickling Estate. They are identified in the BoR as Plots 15/06, 15/07, 15/08, 15/09, 15/10, 15/12, 15/13, 15/14, 15/15, 16/02, 16/03, 16/04, 16/05, 16/07, 16/08, 16/09, 16/10, 16/11, 16/13, 16/14, 17/01, 17/02, 17/04, 17/06, 17/07 and 18/01. The National Trust is also an occupier of Plot 17/03.

- 8.14.9. The National Trust is identified as Objector 37 in the CAOS [REP18-028]. Initially, the National Trust objected to the Applicant's proposal to acquire new permanent and temporary rights over land within the Blickling Estate, including a 100m wide easement through 4.5km of the Estate. It confirmed that the majority of the Estate, including the proposed easement route, was inalienable land and that its concerns focussed on a number of matters including the impact on archaeology of the Blickling Estate [RR-083], [RR-084].
- 8.14.10. The ExA sought further clarity in relation to the nature of the National Trust's objection, as reported in Section 5.16 of this Recommendation Report.
- 8.14.11. At D2, the National Trust gave its "*formal notice of withdrawal of the objection previously lodged*" indicating that it did not consider there were any further matters unresolved, including those matters queried by the ExA, as they were all adequately dealt with through the Outline Written Scheme of Investigation, as secured by R23 [REP2-078].
- 8.14.12. Notwithstanding the National Trust's withdrawal of its objection, WQ3 asked the Applicant to summarise why it requested the land [PD-009]. The Applicant confirmed that the land was required to deliver Work No.6 forming part of the cable corridor. It confirmed that HoTs and an Option Agreement had been agreed with the National Trust. This, combined with the withdrawal of National Trust's objection, in the Applicant's view meant that s130 was no longer engaged [REP7-017, Q3.3.0.21].
- 8.14.13. In coming to its view on National Trust land held inalienably, the ExA has considered the statutory position set out in s130 which provides that where land is held inalienably by the National Trust it would be subject to special parliamentary procedures if the National Trust has made a representation which contains an objection to the CA of the land and it has not been withdrawn. The ExA has also had regard to the guidance contained, in particular, in paragraph 38 and in Annex A, paragraphs 4 and 5 of DCLG CA Guidance.
- 8.14.14. The ExA agrees with the Applicant that s130 is no longer engaged because the condition in s130(3) is no longer met and that special parliamentary procedures are not required.

The case in relation to Open Space land (s132)

- 8.14.15. There are two categories of open space in the application. Firstly, the beach and foreshore at the landfall at Happisburgh South comprising Plots 01/04, 01/05, 01/06, 01/18 and 01/20, and secondly, the crossing of the Marriott's Way long distance footpath comprising Plots 23/07 and 24/10 [REP5-006]. The plots and powers sought are identified on the Special Category Land Plans [AS-011].
- 8.14.16. The Applicant states that it is taking a 'precautionary approach' to treat the beach and foreshore as public open space because of the delay that could be caused to the Proposed Development if it were to enter the special parliamentary procedure process.

- 8.14.17. The beach and foreshore measure approximately 56,372.75 square metres and the parts of the Marriot's Way within the Order Land measure approximately 3,995.68 square metres. The Open Space Land as a whole, measures approximately 60,368.43 square metres.
- 8.14.18. The Applicant states that the Open Space Land is owned by an unknown party and several private parties, comprising Plots 01/04, 01/06, 23/07 and 24/10, 23/07, and 24/10. NNDC is responsible for the management of the land in Plot 01/06 and has an interest in this plot as an occupier, it is also lessee of Plots 01/04, 01/05, 01/06 and 01/18, 01/20. Norfolk County Council (NCC) has an interest in Plots 01/04, 23/07 and 24/10 as highway authority. The Water Management Alliance (WMA) and Norfolk Rivers Internal Drainage Board (IDB) have rights in Plot 23/07 in respect of drainage [SoR REP5-006].
- 8.14.19. Section 132 of PA2008 states that an order granting development consent which authorises the CA of a right over open space will be subject to special parliamentary procedure unless a) the SoS is satisfied that one of subsections 3 to 5 applies; and b) that fact, and the subsection concerned, are recorded in the Order or otherwise in the instrument or other document containing the Order.
- 8.14.20. No surface work is proposed in relation to the beach or Marriott's Way due to the use of trenchless crossing techniques at both locations. The Applicant also considers that rights to install, inspect and maintain equipment would not be any less advantageous to persons in whom it is vested, other persons, if any, entitled to rights of common or other rights, and to the public. Furthermore, there would be no impact on public access to the land and no less advantageous beneficial use of the land for persons in the BoR any other persons entitled to rights over the beach and the public.
- 8.14.21. The Applicant therefore considers that s132(3) would apply, not Special Parliamentary Procedure under s132(2) of PA2008 [REP5-006].
- 8.14.22. NPS EN-1 para 5.10.1 states "*...open space should be taken to mean all open space of public value, including not just land but also areas of water... which offer important opportunities for sport and recreation and can also act as a visual amenity*". In this regard, the ExA agrees with the cautious approach taken by the Applicant to the beach and foreshore, particularly when considered in the context of advice set out in EN-1.
- 8.14.23. The ExA notes that the SoCGs with the relevant local authorities did not raise concerns about the proposals in these locations. No representations objecting to the proposals were received from the WMA or Norfolk Rivers IDB.
- 8.14.24. Whilst the ExA did receive representations in respect of the choice of landfall location; the potential effects of coastal erosion and Marriott's Way (discussed in Chapter 5 of this Recommendation Report), no representations were received relating to equipment installation, inspection and maintenance across the beach and foreshore or the use of

trenchless crossing techniques where the cable is proposed to cross the Marriott's Way.

- 8.14.25. The ExA has had regard to paras 6 and 7 and Annex A of DCLG CA Guidance. The ExA notes that the total amount of open space land exceeds 200 square metres in extent and therefore 132 (5) is not engaged. The ExA also notes this is not replacement land or exchange land, therefore 132 (4) is not engaged.
- 8.14.26. What remains then is whether subsection 132 (3) applies to test if the Order land, when burdened with the Order right, would be no less advantageous to the persons in whom it is vested, other persons entitled to rights of common or other rights and the public. The Applicant's position is that the use of land would be no less advantageous with the burden of rights sought. Furthermore, inclusion in the Order would ensure that, if any minor interests such as easements, rights of way, restrictive covenants or similar interests are discovered that have not previously been negotiated away, powers are available to override those interests. As a result of the application of the Applicant's statutory powers, any beneficiary of such an interest will be entitled only to a right to compensation and not to prevent the scheme from proceeding.
- 8.14.27. The ExA is satisfied with the Applicant's argument and agrees that s132 (3) is engaged.

The case in relation to Highways England land

- 8.14.28. Highways England (HE) is the owner of the A47. Works are proposed to this road including permanent accesses connecting the A47 to Work No.8A, Work No.10A and Work No.10B including highway widening works to create a new junction [REP5-006].
- 8.14.29. These works would be carried out under TP powers (to the extent that there are any land interests not owned by HE that would need to be dealt with under compulsory powers) and adopted by the local highway authority or HE as required [REP5-006].
- 8.14.30. The Applicant stated in the SoR that "*trunk roads and other highways owned by Highways England are no longer formally regarded as Crown land, but in practice they are treated in the same way. Highways England's interests (comprising the A47 and adjoining land at Plots 37/08, 37/19, 37/20 37/21, 41/12, 41/41, 41/42, 41/43, 41/44, 41/48 and 42/05) are excluded from compulsory acquisition in the Book of Reference.*" [REP5-006].
- 8.14.31. WQ2 requested an update from the Applicant and HE regarding licences and property agreements [PD-009]. The Applicant explained that licences would be sought once detailed designs and method statements had been approved by HE prior to construction; property agreements would also be sought once the detailed design and methodology had been approved by HE should the Order be made [REP5-045, Q2.3.0.12].

- 8.14.32. The ExA sought confirmation from HE that it shared the same understanding as the Applicant [PD-025]. HE confirmed that it did, and that licences and property agreements had been sought by the Applicant, for which detailed design and method statements would need to be approved once available.
- 8.14.33. The Applicant and HE issued an updated SoCG to confirm the position [REP16-008], [REP16-019]. The SoCG also confirms that there were no areas of disagreement between the parties.
- 8.14.34. The ExA is satisfied that the representations from HE indicates its agreement to include HE land in the Order.

8.15. STATUTORY UNDERTAKERS LAND (s127 & s138)

- 8.15.1. The effect of s127(5) and (6) PA2008 is that an order granting development consent may include provision authorising the CA of a right over Statutory Undertakers' land by the creation of a new right over land only to the extent that the right can be purchased without serious detriment to the carrying on of the undertaking, or any detriment to the carrying on of the undertaking, in consequence of the acquisition of the right, can be made good by the undertakers by the use of other land belonging to or available for acquisition by them.
- 8.15.2. Section 138 applies where a Statutory Undertaker has a relevant right over land over which CA is sought or there is relevant apparatus on, under or over the land. In these circumstances, the Order can only authorise the extinguishment of the right or removal of apparatus if the SoS is satisfied that this is necessary for the purpose of carrying out the development to which the Order relates.
- 8.15.3. In so far as Statutory Undertakers are concerned, the Applicant seeks to acquire land and new rights in land including interfering with apparatus. This is shown on the Land Plans and described in the BoR. Consequently, both s127 and s138 of PA2008 are engaged by dDCO Article 29 – Statutory Undertakers.
- 8.15.4. Section 138 of the PA2008 has provisions for the removal of Statutory Undertakers' apparatus if the SoS is satisfied that this is necessary for the Proposed Development
- 8.15.5. Article 43 of the dDCO gives effect to Schedule 17 (Protective Provisions). Various representations were received from Statutory Undertakers in respect of these provisions resulting in agreement being reached in all cases apart from with the Environment Agency. The different positions are summarised below.

The case in relation to National Grid

- 8.15.6. The Applicant's proposed works that may interact with National Grids land, rights and apparatus are described in the SoR [REP5-006, paras

7.9.41 to 7.9.57]. The Applicant is seeking to negotiate to acquire the land, and rights over land necessary for the Proposed Development from National Grid by private treaty.

- 8.15.7. The Applicant does not consider it necessary to replace the land over which rights are required for the Proposed Development and submits that the interest sought in land could be purchased and not replaced without serious detriment to the carrying on of the undertaking [REP5-006].
- 8.15.8. The Protective Provisions include protection for National Grid Electricity undertakers and for National Grid Gas undertakers.
- 8.15.9. At the outset of the Examination National Grid had concerns with the drafting of some of the Protective Provisions. Amendments were made including drafting changes to reflect wording of the Protective Provisions in the made Norfolk Vanguard OWF Order [REP13-017]. Whilst National Grid confirmed that it was largely content, it requested that drafting previously agreed between the two parties relating to paragraph 12, transfer of the benefit of the Order, should be retained for the Proposed Development's Order and not altered as per the Norfolk Vanguard OWF Order [REP14-062, Q5.5.8.1]. As set out Appendix 2 of REP14-062, paragraph 12 (2) and (3) would be reinstated so that the whole paragraph would read as follows:

"Application

"(1) For the protection of National Grid as referred to in this Part of this Schedule the following provisions have effect, unless otherwise agreed in writing between the undertaker and National Grid.

"(2) Subject to sub-paragraph (3) or to the extent otherwise agreed in writing between the undertaker and National Grid, where the benefit of this Order is transferred or granted to another person under article 6 (Benefit of the Order)—

"(a) any agreement of the type mentioned in sub-paragraph (1) has effect as if it had been made between National Grid and the transferee or grantee (as the case may be); and

"b) written notice of the transfer or grant must be given to National Grid on or before the date of that transfer or grant.

"(3) Sub-paragraph (2) does not apply where the benefit of the Order is transferred or granted to National Grid (but see paragraph 22(3)(b))." [REP14-062]

- 8.15.10. National Grid explained that in its view:

"This wording protects (it) from the risks of the transfer of benefit to an entity with insufficient covenant strength to back off the indemnity given in paragraph 22 (Compensation) of the Protective Provisions for National Grid's benefit on the face of the Order, without the need to seek amendments to the Transfer of Benefit Article in the DCO." [REP14-062]

- 8.15.11. The Applicant confirmed that the wording was included in the dDCO at paragraph 12 of Schedule 17, Part 2 [REP15-003]. The Applicant explained that National Grid will explain in their response to the ExA's fifth round of written questions, the agreed wording at paragraph 12 was included at the request of National Grid and is designed to protect National Grid against a transfer of benefit to parties without sufficient covenant strength to meet the indemnity provisions in the Protective Provisions without having to seek amendments to the Article dealing with Transfer of Benefit and is accordingly important to National Grid. Therefore, should the ExA, or the SoS wish to make any amendments to these Protective Provisions then National Grid request that they are consulted before doing so.
- 8.15.12. The ExA considers this drafting does provide additional clarity for the undertaker that should the transfer of the benefit of the Order take place at some future time, it would have certainty that any compensation provisions would be met.
- 8.15.13. The Applicant confirmed that the wording was agreed towards the end of the Examination; although National Grid neither agreed nor disagreed with this position. The SoS may therefore wish to seek direct confirmation from National Grid to satisfy themselves on this matter.
- 8.15.14. From the representations received, the ExA is satisfied that s127 is engaged, and that the CA rights sought can be purchased without serious detriment to the carrying on of the undertaking. The rDCO therefore accords with s127 of PA2008.
- 8.15.15. The ExA has also considered the position in the context of s138. The ExA is satisfied that the removal of apparatus under the Order would be necessary for the purposes of carrying out the Proposed Development. The rDCO therefore accords with s138 of PA2008.

The case in relation to Network Rail

- 8.15.16. The Applicant explains that in order to connect the Proposed Development to the National Grid substation at Necton, it would be necessary to install the cables, fibre optic cables and ducts under a railway owned by Network Rail Infrastructure Limited (Network Rail). This is the Norwich to Sheringham railway line, south west of Lyngate Road and north west of North Walsham, Norfolk (Plot 10/04).
- 8.15.17. The Applicant is seeking to acquire the rights over land necessary for the Project from Network Rail by private treaty. In the absence of a private treaty agreement with Network Rail, it is necessary to include Network Rail's land in the Order to ensure that all the land required to deliver the Proposed Development can be assembled within the necessary timeframe. It remains the Applicant's preference and intention to acquire the rights by agreement.
- 8.15.18. The Applicant does not consider it necessary to replace the land required for the Proposed Development and submits that the interest sought in

land can be purchased and not replaced without serious detriment to the carrying on of Network Rail's undertaking [REP5-006].

- 8.15.19. At the beginning of the Examination, objections to the proposal were received from Network Rail. These were subsequently resolved with the Applicant and agreed Protective Provisions added to dDCO Version 7, Schedule 17 Part 5 given effect by Article 43 [REP10-004].
- 8.15.20. Network Rail formally withdrew its representations [RR-100 and REP2-109] at D13, following conclusion of commercial arrangements with the Applicant [REP13-048].
- 8.15.21. Further amendments were made to the Protective Provisions in favour of Network Rail by the Applicant in light of the made Norfolk Vanguard OWF Order [REP13-008, Version 7]. The Applicant confirmed that Network Rail was in agreement with these drafting amendments [REP14-036, Q5.4.0.11]. Network Rail neither agreed nor disagreed with this position. The SoS may therefore wish to seek direct confirmation of the final position to satisfy themselves on this matter.
- 8.15.22. From the representations received, the ExA is satisfied that s127 is engaged, and that the CA rights sought can be purchased without serious detriment to the carrying on of the undertaking.
- 8.15.23. The ExA has also considered the position in the context of s138 and is satisfied no removal of apparatus would be necessary for the purposes of carrying out the Proposed Development and therefore s138 is not engaged.

The case in relation to Cadent Gas Ltd

- 8.15.24. The Applicant is looking to secure a crossing agreement with Cadent Gas through private treaty in tandem with the compulsory acquisition process and does not consider it necessary to replace the land over which rights are required submitting that the interest sought in land can be purchased and not replaced without serious detriment to the carrying on of Cadent Gas Ltd's undertaking.
- 8.15.25. Cadent Gas Ltd raised minor concerns which were subsequently resolved and agreed Protective Provisions added to Version 7, Schedule 17 Part 3 of the dDCO, given effect by Article 43 [REP10-004].
- 8.15.26. Further amendments were made to the Protective Provisions by the Applicant in light of the made Norfolk Vanguard OWF Order [REP13-008, Version 7]. The Applicant confirmed that Cadent Gas Ltd is in agreement with these drafting amendments [REP14-036, Q5.4.0.11].
- 8.15.27. Cadent Gas is identified as Objector 5 on the COAS [REP18-025]. The Applicant confirmed both parties had agreed commercial terms. Cadent Gas Ltd agreed, providing formal notice of the withdrawal of its objection to the application [REP10-054].

- 8.15.28. From the representations received, the ExA is satisfied that s127 is engaged, and that the CA rights sought can be purchased without serious detriment to the carrying on of the undertaking.

The case in relation to UK Power Networks

- 8.15.29. The Applicant confirmed it was seeking a compromise agreement and Protective Provisions for the protection of UK Power Networks (UKPN). The Applicant did not consider it necessary to replace the land over which rights are required and submits that the interest sought in land can be purchased and not replaced without serious detriment to the carrying on of UKPN's undertaking.
- 8.15.30. UKPN did not submit a representation to the Examination and the Applicant confirmed that agreement has been reached with it [REP8-015].
- 8.15.31. From the representations received, the ExA is satisfied that s127 is engaged, and that the CA rights sought can be purchased without serious detriment to the carrying on of the undertaking.
- 8.15.32. The ExA has also considered the position in the context of s138 and that this would be necessary for the purposes of carrying out the Proposed Development. The rDCO therefore accords with s138 of PA2008.

The case in relation to Anglian Water Services Limited

- 8.15.33. The Applicant confirmed it was seeking rights over land necessary for the Proposed Development by private treaty and would continue with those negotiations in tandem with CA with a view to concluding an agreement and Protective Provisions for the protection of Anglian Water Services Limited (Anglian Water).
- 8.15.34. Schedule 17, Part 6 provides protection for Anglian Water, which confirmed it was supporting the wording of the Protective Provisions [REP2-099].
- 8.15.35. The Applicant updated Schedule 17, Part 6 of the dDCO to reflect the made Order for Norfolk Vanguard OWF. These changes were made to Version 8 of the dDCO [REP13-008].
- 8.15.36. Anglian Water confirmed it was content with these amendments as in its view, it did not change the substance of the Protective Provisions as submitted [REP14-055]. Anglian Water provided further confirmation at D16 that the Protective Provisions included in the dDCO were agreed [REP16-015].
- 8.15.37. From the representations received, the ExA is satisfied that s127 is engaged, and that the CA rights sought can be purchased without serious detriment to the carrying on of the undertaking.

- 8.15.38. The ExA has also considered the position in the context of s138 and that this would be necessary for the purposes of carrying out the Proposed Development. The rDCO therefore accords with s138 of PA2008.

The case in relation to the Environment Agency and drainage authorities

- 8.15.39. Schedule 17, Part 7 provides protection for the Environment Agency (EA) and drainage authorities. Whilst the EA was content with much of the drafting of the Protective Provisions in the dDCO, it did not initially reach agreement with the Applicant in relation to deemed or refused consent at paragraph 73 of Schedule 17, Part 7 [REP14-056]. In its view, the Protective Provisions should reflect the principles of the environmental permitting regime and default to deemed refusal as opposed to deemed approval which is argued for by the Applicant [REP9-020].
- 8.15.40. During ISH5, in response to questions from the ExA, the Applicant cited the made Norfolk Vanguard OWF Order which had adopted the deemed approval wording. This, in the Applicant's view, provided recent precedent to support its position. Furthermore, it argued that given the overlap in the onshore areas across both the Norfolk Vanguard Order and that for the Proposed Development, *"to maintain efficiencies and avoid confusion for contractors and statutory undertakers"* the procedures for the approval of plans should follow the same process across both the projects [REP13-016].
- 8.15.41. After further negotiation between the parties, the final SoCG between the EA and the Applicant confirms that agreement was eventually reached over the deemed refusal mechanism within the Protective Provisions, whereby a lack of response from the relevant drainage authority within two months of submission of particulars for any specified works would be deemed to be a refusal of the scheme or plans sought by the Applicant [REP16-007].
- 8.15.42. Other drafting amendments to the Protective Provisions were proposed by NCC and other drainage authorities during the Examination. Amendments were made to include addition of the word *"relevant"* before *"drainage authority"*. These discussions and the ExAs conclusions are detailed in Section 5.7 of this Recommendation Report.
- 8.15.43. The final SoCG confirms that the wording of Protective Provisions was agreed was agreed. The SoS may wish to seek direct confirmation of the final position to satisfy themselves on this matter.
- 8.15.44. From the representations received, the ExA is satisfied that s127 is engaged, and that the CA rights sought can be purchased without serious detriment to the carrying on of the undertaking.

Mid Norfolk Railway Preservation Trust

- 8.15.45. Mid-Norfolk Railway Preservation Trust (MNRPT) submitted a representation explaining that the description of its railway as 'disused'

was incorrect and that it was a statutory power in its own right. It also questioned what CA powers were being sought by the Applicant. A copy of the Mid Norfolk Railway Order 2001 was appended to its written submission.

- 8.15.46. The ExA noted that MNRPT was identified in the BoR as being the Freehold Owner of Plot 33/06, described as *"1400.22 square metres of land being disused railway track (North of bridge 1695), trees and shrubbery to the north of Northall Green, Norfolk."* [REP11-006]. The BoR stated that the type of interest sought was the acquisition of permanent new rights, whilst the SoR detailed the Applicant's justification for the use of CA powers, including paragraph 7.9.12, Major Crossings [REP5-007]. The ExA also noted that Plot 33/06 was identified in Schedule 6 of the dDCO [REP13-007].
- 8.15.47. The ExA sought further information relating to MNRPT [PD-023]. The Applicant was asked to:
- a. provide further justification for the CA of new rights in land;
 - b. detail the steps that were being taken to address the specific matters set out in s127 of PA2008 and to ensure that there is no detriment to the undertaking;
 - c. confirm the position in relation to s138 and the necessity for interference; and
 - d. notwithstanding whether or not MNRPT was a statutory undertaker, consider whether Protective Provisions should be drafted and agreed for the benefit of MNRPT.
- 8.15.48. The ExA reminded the Applicant that if the objection from MNRPT was not withdrawn by the end of the Examination, and the relevant statutory test was not met, the SoS would be unable to authorise powers relating to that statutory undertakers land unless the Applicant considered that the MNRPT was not a statutory undertaker for the purposes of s127.
- 8.15.49. The Applicant responded to confirm that Plot 33/06 would be a trenchless crossing point with no surface works and therefore no interruption with the surface of the land and the operation of the railway. It confirmed discussions had been ongoing since 2018 with MNRPT who had previously advised that it understood the principles of the project and saw no issue in signing Heads of Terms (HoTs); and that in 2019 MNRPT's solicitors stated that the instructions from their client were to agree in principal to the agreement, and both legal representatives were now negotiating the Option Agreement [REP14-038].
- 8.15.50. The Applicant confirmed that it considered s127 to apply to MNRPT. In its opinion, the SoS could be satisfied that subsections 127(5) and (6) of PA2008 would apply and that the nature and situation of the land were such that the rights required by the Applicant could be purchased without serious detriment to the carrying on of the MNRPT's undertaking. That was because the rights acquired would be exercised using trenchless methods and no surface works would be required. This would be the process proposed to be used for both the acquisition of the rights by

agreement or in the absence of agreement, using compulsory acquisition powers.

- 8.15.51. The Applicant did not consider s138 would apply because there would not be extinguishment of a relevant right, nor removal of relevant apparatus as defined in s138 and the Applicant has not sought to include such rights in relation to the MNRPT within the dDCO
- 8.15.52. The Applicant did not consider Protective Provisions were required given that a requirement for a trenchless crossing under the railway was secured within Requirement 16(13)(o) of the dDCO (Wymondham to North Elmham Railway line at Dereham (Work No. 7)), as also shown on sheet 33 of the Works Plans.
- 8.15.53. The Applicant updated the BoR to reflect the active nature of the railway removing the reference to 'disused' [REP18-015] It also added MNRPT to the CAOS [REP18-028].
- 8.15.54. The ExA also received a further representation from MNRPT confirming that agreement in principle on commercial terms had been reached with the Applicant in so far as the Proposed Development interacted with the property of MNRPT. Therefore, MNRPT stated that it wished to withdraw its previous representation to the Examination [REP14-060].
- 8.15.55. From the representations received, the ExA is satisfied that s127 is engaged, and that the CA rights sought can be purchased without serious detriment to the carrying on of the undertaking. The ExA has also considered the position in the context of s138 and is satisfied no removal of apparatus would be necessary for the purposes of carrying out the Proposed Development and therefore s138 is not engaged.

Other Undertakers

- 8.15.56. Eni UK Ltd submitted a Relevant Representation [RR-063] seeking to ensure its offshore activities interfaced safely with those of Vattenfall, and that the siting of any OWF infrastructure would not have a significant adverse impact on its ability to carry out its activities
- 8.15.57. Eni UK Ltd is identified as Objector 21 on the CAOS [REP18-025]. The Applicant stated that Eni UK Ltd no longer held an interest in the land affected by the Proposed Development [REP5-045], including email correspondence confirming this position [REP5-046, Appendix 3.3].
- 8.15.58. The ExA did not receive representations from TC Dudgeon OFTO Plc (TCP); Blue Transmission Sheringham Shoal Limited; British Telecommunications plc; Water Management Alliance; British Pipeline Agency Limited; or Vodafone Limited.
- 8.15.59. The Applicant explained that it was seeking to acquire the rights over land by private treaty. General Protective Provisions for gas, water and sewerage undertakers are also included at Schedule 17, Part 1 of the dDCO. Schedule 17, Part 4 provides general protection for Operators of Electronics Communications Code Networks.

- 8.15.60. In the absence of any evidence to the contrary, the ExA is satisfied that s127 is engaged, and that the CA rights sought can be purchased without serious detriment to the carrying on of the undertaking.
- 8.15.61. The ExA has also considered the position in the context of s138. The ExA is satisfied that the removal of apparatus under the rDCO would be necessary for the purposes of carrying out the Proposed Development.

Norfolk Vanguard Ltd

- 8.15.62. No representations were submitted by Norfolk Vanguard Ltd to the Examination and both parties agreed the drafting of the Protective Provisions set out at Schedule 17, Part 9.
- 8.15.63. The Applicant and Norfolk Vanguard Ltd share the same parent company. The Protective Provisions secure cooperation between the undertaker and any future undertaker of the Norfolk Vanguard OWF. The ExA is satisfied that the Protective Provisions secure cooperation between undertakers now and in the future should the Order for the Norfolk Boreas OWF be consented.

Ørsted Hornsea Project Three (UK) Ltd

- 8.15.64. Ørsted Hornsea Project Three (UK) Ltd Protective Provisions are found at Schedule 17, Part 8. The Applicant updated these in light of the Norfolk Vanguard OWF Order, confirming that the changes were agreed by Ørsted Hornsea Project Three (UK) Ltd [REP14-036].
- 8.15.65. The final SoCG between the parties does not record any areas of disagreement. It also states that *"reciprocal protective provisions have ... been included in the dDCOs for the projects which govern the interaction of the projects and rights in relation to the areas in which the cables cross."* [REP16-027]; [REP16-013].
- 8.15.66. In so far as CA powers are concerned, the SoCG states that parties would seek to enter into *"either a tri-partite Option Agreement or a direct voluntary agreement with the relevant landowner to acquire the rights necessary to construct, use and maintain assets for the parties at the cable crossing point"*. Adding that the terms of the Option Agreement would include crop loss and severance compensation in the scenario where *"the accumulative impact of projects in construction at the same time have increased impact to the landowner when compared to separate construction periods."* A Co-operation Agreement, reported to be at an advanced stage of negotiation, would (amongst other things), regulate the exercise of compulsory acquisition and temporary use powers [REP16-013].
- 8.15.67. The ExA notes that both parties are in agreement and is satisfied that the Protective Provisions secure ongoing and future cooperation between the parties should the Order be made.

8.16. INDIVIDUAL OBJECTIONS RECEIVED TO COMPULSORY ACQUISITION AND OTHER MATTERS

- 8.16.1. This part of the Recommendation Report considers individual objections. Before doing so, the ExA draws attention to the conclusion reached previously in Chapter 7 that the case for development has not been made. Therefore, the ExA does not consider that there is a compelling case in the public interest for the powers to be granted and proceeds in its consideration of individual objections with this caveat in mind.
- 8.16.2. The ExA has examined these objections against the tests set out in the PA2008 (s122 and s123), having regard to DCLG CA Guidance and the provisions of the Human Rights Act 1998 and the Equalities Act 2010. It has considered whether there is a legitimate purpose, whether they are necessary and proportionate, and whether there are suitable compensation provisions.
- 8.16.3. The ExA has also considered objections to the powers of TP and whether the rights sought are for a purpose and timescale that has been identified, are compatible with human rights tests, and whether there are suitable compensation provisions for those who may be able to make a claim under Section 10 of the Compulsory Purchase Act 1965 or Part 1 of the Land Act 1973. The ExA has had regard to the Human Rights Act in considering the grant of powers of TP and also the need and justification for such powers.
- 8.16.4. The ExA first considers the overall objection made by the National Farmers Union (NFU) and the Land Interest Group (LIG) as these bodies represented a significant number of individuals. The ExA then identifies individual objections set out in the CAOS, grouped where possible.

Joint Objection from the NFU and the LIG

- 8.16.5. Several land agents (Savills, Strutt & Parker, Bidwells, Irelands, Brown & Co and Cruso & Wilkin) worked in collaboration with the NFU during the Examination. The land agents stated that they represented approximately 60 clients, referring to themselves as the LIG.
- 8.16.6. The NFU and LIG submitted an identically worded joint relevant representation on behalf of 35 of their clients. These were Objectors 11; 13; 14; 15; 17; 18; 19; 20; 22; 23; 24; 25; 26; 27; 28; 29; 30; 31; 32; 33; 34; 35; 36; 38; 39; 40; 41; 42; 43; 44; 46; 49; 50; 53; and the executors of Objector 57 as subsequently identified by the ExA in the CAOS.
- 8.16.7. The Relevant Representations were wide-ranging. Matters arising were examined by the ExA, with the findings and conclusions reported in Chapter 5 and this chapter of the Recommendation Report. The location where the topics have been considered are as follows:
- a. concerns about the proposed substations, reported in Section 5.3;

- b. potential for disruption to farming activities arising from the timing of construction and its relationship with timing of construction of Norfolk Vanguard OWF, reported in Section 5.4 and Section 5.8;
- c. funding, this Chapter;
- d. cumulative effects when considered alongside Norfolk Vanguard OWF and Hornsea Project Three OWF, reported in Sections 5.8 and 5.22;
- e. location and number of link boxes; reported in Section 5.8;
- f. drainage, reported in Section 5.7;
- g. drafting of Voluntary Option agreements, this chapter;
- h. soil treatment, reinstatement and aftercare, reported in Section 5.4 and Section 5.8;
- i. flooding, reported in Section 5.7;
- j. management of construction effects such as noise and dust, reported in Sections 5.2, 5.4, 5.5 and 5.12;
- k. effects on private water supplies, reported in Section 5.8; and
- l. routes to gain access to the working strip, reported in Section 5.2 [RR-044].

8.16.8. Table 1 below identifies those that were included in the generic NFU/LIG representation. No further representations were received from these parties. Each objector also reached agreement on a voluntary basis with the Applicant for the CA of their land and/or rights. This is recorded in the CAOS and was confirmed by the NFU / LIG in response to the ExA's written questions.

Table 8.16.1: Objectors submitting joint NFU/LIG relevant representation and agreeing HoTs with the Applicant

Objector Number	Name / Organisation	Relevant Rep / Other document
11	Thomas Love	RR-055
13	Mr Charles Sayer	RR-049
15	Mrs C B Hart	RR-051
17	G F de Feyter and Partners	RR-065
18	E H Wenn Happisburgh Ltd	RR-062
19	HBSC Pensions Scheme	RR-066
22	Mrs A Green	RR-080
23	Mrs P Hinton	RR-082
24	Mr G Hales	RR-072
25	Dr G Cubitt	RR-061
28	Mr M Howell	RR-076
29	Diocese of Norwich	RR-060

30	Mr R Baldwin	RR-079
31	Farnham Farms Ltd	RR-064
33	Mr P Bunting	RR-077
36	Mrs A Jones	RR-081
40	Mr M and Mrs J Ditch	RR-075
41	Trustees of W M and S J Bulwer Long 1983 Settlement	RR-088
44	Mr Kyle White	RR-074
46	William Youngs and Son (Farms) Ltd	RR-089
50	David Perry Warnes	RR-093
53	Mrs P Riches	RR-098
57	The Executors of Mr G Vout	AS-015

8.16.9. In its WQ2 [PD-009, Q2.3.0.30], the ExA requested all objectors (and/or their respective agents) identified in the CAOS subject to the CA of their land or rights, to:

- confirm whether they maintained an objection, providing specific details of the reasons why they object, in relation to the individual's specific land/rights that would be affected by CA;
- provide an update on discussions with the Applicant and whether they anticipate that agreement was likely to be reached between the parties before the end of the Examination; and
- confirm if agreement had been reached and the objection resolved.

8.16.10. No response was received from any objector (or their agent) identified in Table 1 in relation to this question.

ExA's consideration of the joint objection from the NFU/LIG

8.16.11. For the reasons stated earlier in this Recommendation Report, the ExA has reached the view that there is not a compelling case in the public interest for the powers of CA or TP to be granted.

8.16.12. However, should the SoS take a different view, the ExA has examined the relevant matters and the representations made. The ExA considers that the Applicant has provided extensive evidence of ongoing dialogue between the parties to reach a negotiated agreement. The evidence provided by the Applicant and confirmed in representations by the NFU/LIG leads the ExA to conclude that although the parties listed in Table 1 have not submitted any further representations, they have not withdrawn their objection to the Proposed Development.

8.16.13. The ExA is satisfied that the route for the onshore cable corridor has been chosen in the light of general effects from CA and TP. The ExA is

therefore satisfied that interference with the land and rights of objectors identified in Table 1 above would be necessary for the Proposed Development. Any adverse effects, if proven, could give rise to a claim for compensation.

- 8.16.14. Previously in this Chapter, the ExA has concluded that should the SoS be minded to make the Order, the powers requested would be for a legitimate purpose, necessary for the Proposed Development and proportionate, and that suitable compensation mechanisms exist to address any adverse effects on the land. Should the SoS be minded to make the Order, the ExA advises that CA and temporary use powers could be granted in relation to the objectors identified in Table 1.

Access issues

- 8.16.15. As discussed in Section 5.2 of this Recommendation Report, the Outline Access Management Plan (OAMP) details the proposed accesses required in Scenario 1 and Scenario 2 for construction and operation of the Proposed Development [REP10-021]. All accesses are detailed graphically on the Access to Works Plan [APP-011]. Some objectors who were party to the joint representation by NFU/LIG raised matters during the Examination in relation to accesses.
- 8.16.16. These objectors are listed in Table 2 below. Table 2 includes the location of their subsequent representations and whether HoTs were agreed or not, as evidenced in the Applicant's final form CAOS [REP18-028]. As previously mentioned, the CAOS details the relevant plots and whether the Applicant is seeking CA or TP of land and/or rights.

Table 8.16.2: Persons submitting representations in respect of access

Objector Number	Name / Organisation	Relevant Rep / Other representation	Status of Heads of Terms agreement
14	Mr Cubitt Siely	RR-050	AGREED AND SIGNED
27	L Padulli	RR-068	AGREED BUT NOT SIGNED
32	Mr G Anderson (Dillington Hall Estate)	RR-071	AGREED AND SIGNED
34	Mr J Carrick	RR-073	ISSUED
35	Mr and Mrs M J Jones	RR-070	AGREED AND SIGNED
38	Mr P Mutimer	RR-078	AGREED AND SIGNED
39	Albanwise Ltd.	RR-057	AGREED BUT NOT SIGNED.

			DISCUSSIONS ARE NOW FOCUSED ON OPTION AGREEMENT NEGOTIATIONS RATHER THAN COMPLETING THE HEADS OF TERMS
42	Trustees of Stinton Hall Trust	RR-087	ISSUED UNCLEAR IF IT IS AN ACCESS ISSUE
49	Christopher S Wright	RR-092	ISSUED UNCLEAR IF IT IS AN ACCESS ISSUE
58	James Edward Keith	REP5-074*	AGREED AND SIGNED
59	Bawdeswell Estate	REP5-074*	AGREED AND SIGNED
60	Bawdeswell Estate	REP5-074*	AGREED AND SIGNED

*Not party to the generic NFU/LIG Relevant Representation but represented by the NFU/LIG.

Objection 14 Mr. Cubitt Siely

- 8.16.17. The NFU explained that the landowner had an ongoing concern about access [REP5-074, Q2.3.0.34]. The landowner proposed the use of a farm track for maintenance issues post construction as opposed to Access to Works 1 (AC1) [APP-011 Sheet 1 & 2], [REP10-062; Q4.3.0.6]. The Applicant stated that it would consider matters further through discussion with the landowner via a private Option Agreement [REP11-007].
- 8.16.18. The CAOS confirms that HoTs had been agreed and signed by both parties by the close of the Examination.

Objection 27 L Padulli

- 8.16.19. The NFU explained that whilst the landowner had agreed access for construction, it had an ongoing concern about access post construction [REP5-074, Q2.3.0.34;]. The Applicant confirmed it had put forward an alternative proposal [REP11-007]. At D14, the Applicant confirmed that outstanding concerns relating to access routes had been resolved and would be dealt with via a final Option Agreement [REP14-041].

- 8.16.20. The ExA undertook a USI to the disputed access to understand the concerns of the landowner better [EV2-004]. The access is AC50 on a minor road south of Brick Kiln Lane, North of Felmingham [APP-011 Sheets 10 & 11].
- 8.16.21. The CAOS provides confirmation that HoTs had been agreed but not yet signed by both parties.

Objection 32 Mr G Anderson (Dillington Hall Estate)

- 8.16.22. The NFU explained that the landowner had an ongoing concern about accesses [REP5-074, Q2.3.0.34]. Although the ExA sought more information in WQ4 as to whether or not a specific access identified on the Access to Works plans [PD-016; APP-011] was in dispute this information was not forthcoming from the parties [REP10-034], [REP10-062, Q4.3.0.2]. The NFU also explained that Strutt and Parker would respond on behalf of the landowner at Deadline 11, but no evidence was submitted into the Examination [REP10-62].
- 8.16.23. The ExA has not been provided with specific details about the objectors concerns over accesses.
- 8.16.24. The CAOS confirms that HoTs had been agreed and signed by both parties by the close of the Examination.

Objection 34 Mr J Carrick

- 8.16.25. Subsequent to WQ2 and WQ3, the ExA established that the access track in dispute is off the Woodgate Road, Swanton Morley, providing access to Park Farm Camping and also what the ExA understands to be a rear access to Hunters Hall wedding and events venue. It is identified on the Access to Works Plan as AC131 [APP-011, Sheet 30].
- 8.16.26. The Applicant provided a detailed explanation of why the access was needed [REP7-017, Q3.3.0.10]. The NFU explained that the objector remained concerned about the effect of the proposal on existing enterprises and businesses that had rights over the track to land adjoining the track, and that clarity and agreement was being sought over how the Applicant proposed to mitigate this [REP10-062]. At D11, the Applicant confirmed that it was still in discussion with the landowner over these matters [REP11-007]. No representations were received by any other business or enterprise in relation to this location.
- 8.16.27. The ExA visited the location on a USI, travelling along Elsing Road and Woodgate Road to understand better the concerns of the landowner in this location and the proposal put forward by the Applicant to mitigate matters [EV2-004]. The ExA also issued a Rule 17 request for Further Information asking the landowner (or its agent) to explain the reasons behind their continuing objection by reference to specific land plots/and/or rights that would be affected by compulsory acquisition and for the Applicant to comment on this response [PD-025].

- 8.16.28. No response was provided by the landowner (or its agent) to the Rule 17 request and therefore the Applicant was not able to comment further.
- 8.16.29. The CAOS provides evidence that although HoTs have been issued, no further progress was made before the end of the Examination.

Objection 35 Mr and Mrs M J Jones

- 8.16.30. The NFU confirmed that the landowner had an ongoing concern about accesses in response to WQ2 [REP5-074, Q2.3.0.34].
- 8.16.31. After further probing by the ExA the parties explained it was AC128 and AC129 that were the source of contention [APP-011, Sheet 29]. The Applicant provided a detailed response to the ExA's WQ4 [PD-016], explaining the concerns of the landowner in relation to the two accesses and the steps that were being taken to resolve these concerns [REP10-034, Q4.3.0.12].
- 8.16.32. The Applicant also confirmed it would use different accesses where the cable corridor crossed the highway rather than AC128 and AC129 and that this would be secured through private agreement. HoTs for the Option Agreement have been agreed and signed by both parties as confirmed in the CAOS and discussions relating to the precise wording of the Option and Deed documentation were ongoing.
- 8.16.33. The Applicant explained why it considered it necessary to keep AC128 and AC129 in the dDCO as follows:

"Whilst agreeing heads of terms with a landowner demonstrates significant progress, those heads of terms cannot be relied upon by either the Applicant or landowner. Once the option agreement is exchanged both parties will have a contractual agreement which is enforceable. That option agreement with M and D Jones will provide for the Applicant not to exercise compulsory acquisition powers against M and D Jones provided that the terms of the option agreement are complied with.

"Until such time as the option agreement is in place the Applicant needs to retain the ability to use compulsory acquisition powers against M and D Jones, and subsequently should the terms of the option agreement not be complied with. In addition the Applicant may need to utilise compulsory acquisition powers against any unknown third party, due to any subsequent title issues which arise even if the agreement reached is to use that access" [REP10-034].

- 8.16.34. The ExA visited the location of the two accesses either side of Elsing Road, south of Swanton Morley, Dereham on a USI [EV2-004].
- 8.16.35. The CAOS confirms that HoTs had been agreed and signed by both parties by the close of the Examination.

Objection 38 Mr P Mutimer

- 8.16.36. In response to WQ2 and WQ3, the parties explained it was AC53 that was the source of contention. This access is off Rectory Road, north of Felmingham and south of Brick Kiln Lane [APP-011, Sheet 12], [REP5-074, Q2.3.0.34]. The landowner preferred the Applicant to use AC54 [REP6-023]. AC54 is further to the south on Rectory Road, directly on the route of the proposed cable corridor, Work No. 5, between reference points 12a and 12b on the Works Plan, as described in Schedule 2 of the dDCO [REP14-003, Sheet 12].
- 8.16.37. In response to comments from the landowner at Deadline 10 [REP10-062] the ExA questioned why it was necessary to retain AC53 within the dDCO, when recourse to remedy for any breach of an agreement could be sought through the Courts and the powers of Compulsory Acquisition are a last resort power [PD-016, Q4.3.0.7].
- 8.16.38. The Applicant engaged the same argument as that referenced above in this Recommendation Report in relation to Mr and Mrs M J Jones [REP10-034].
- 8.16.39. The CAOS confirms that HoTs had been agreed and signed by both parties by the close of the Examination.

Objector 39 Albanwise Ltd

- 8.16.40. The ExA requested an explanation of the issues in contention at WQ4 and also via a Rule 17 letter [PD-016; Q4.3.0.9; PD-025]. No such detail was forthcoming from the parties into the detailed nature of the objections.
- 8.16.41. In response to a request from the ExA at WQ3 [PD-014, Q3.3.0.11] the Applicant included Plots 12/03 and 12/05 into the CAOS [REP7-023] explaining that this was a rebuttal presumption. The ExA questioned what a rebuttal presumption was to which the Applicant responded with an explanation at D11 [REP11-007].
- 8.16.42. The CAOS provides confirmation that although HoTs had been issued, these were not signed by both parties and that discussions had turned to focussing on Option Agreement negotiations, as opposed to finalising HoTs.

Objector 42 Trustees of Stinton Hall Trust

- 8.16.43. The ExA questioned why the Trustees of Stinton Hall Trust, Row 42 of the CAOS [REP6-023] were not included in the BoR. The Applicant explained that the land included in the BoR known as the Salle Estate was owned in title by 4 trustees. However, through discussions with the representing Land Agent in relation to this land, they requested that the land was split into two separate trusts referred to as the Salle Park Trust and Stinton Hall Trust. This approach was for the purposes of the private agreements and the correct landownership remains as documented in the BoR. The Applicant considered that therefore, there was no need to update the BoR or the CAOS.

- 8.16.44. The ExA noted from the CAOS that HoTs were agreed and signed with the Trustees of Salle Park Trust. HoTs had also been issued to the Trustees of Stinton Hall Trust, but it was not clear what progress had been made. The ExA requested an explanation of the issues in contention at WQ4 and also via a Rule 17 letter [PD-016, Q4.3.0.9], [PD-025]. No further information was forthcoming.

Objector 49 Christopher S Wright

- 8.16.45. Changes were made to the objector's interest to include land adjoining the highway where that land has no registered titles. The Applicant's explanation for this inclusion is set out at D10 [REP10-034, Q4.3.0.10].
- 8.16.46. The Applicant confirmed that negotiations were ongoing, and that HoTs had been issued but not agreed with the objector as reflected in the CAOS.
- 8.16.47. The ExA requested an explanation of the issues in contention at WQ4 and also via a Rule 17 letter [PD-016, Q4.3.0.10; PD-025]. However, parties would not be drawn on the detailed nature of the objections.

Objector 58 James Edward Keith

- 8.16.48. In response to WQ2, the NFU/LIG stated that the objector had access issues relating to AC141 and AC143. Details were not provided by agents acting for the objector [REP10-062]
- 8.16.49. The CAOS confirms that HoTs had been agreed and signed by both parties by the close of the Examination.

Objectors 59 and 60 Bawdeswell Estate

- 8.16.50. In response to WQ2, the NFU/LIG stated that these objectors had access issues. Details were not provided by agents acting for the objector [REP10-062]
- 8.16.51. The CAOS confirms that HoTs had been agreed and signed by both parties by the close of the Examination.

ExA's consideration of access issues

- 8.16.52. In its WQ2 [PD-009, Q2.3.0.30], the ExA requested all objectors (and/or their respective agents) identified in the CAOS subject to the CA or TP of their land or rights, to:
- confirm whether they maintained an objection, providing specific details of the reasons why they object, in relation to the individual's specific land/rights that would be affected by CA;
 - provide an update on discussions with the Applicant and whether they anticipate that agreement was likely to be reached between the parties before the end of the Examination; and
 - confirm if agreement had been reached and the objection resolved.

- 8.16.53. No response was received from any objector identified in Table 2 (or their agent).
- 8.16.54. For the reasons stated earlier in this Recommendation Report, the ExA has reached the view that there is not a compelling case in the public interest for the powers of CA or TP to be granted.
- 8.16.55. However, should the SoS take a different view, the relevant matters have been examined. The ExA considers that the Applicant has provided extensive evidence of ongoing dialogue between the parties to reach a negotiated agreement.
- 8.16.56. From the evidence provided by the Applicant in the CAOS, and confirmed by the NFU/LIG as being an accurate summary, the ExA considers that significant progress has been made agreeing HoTs through negotiation with Affected Persons that have made representations in relation to issues over access.
- 8.16.57. Nonetheless, as the Applicant itself argues "*those heads of terms cannot be relied upon by either the Applicant or landowner*" and it is only at the point where an Option Agreement has been exchanged by both parties, is there a contractual agreement which would be enforceable [REP10-034]. The ExA agrees with this position, and therefore concludes that HoTs cannot be relied upon when concluding whether or not there is an objection to the powers sought.
- 8.16.58. Some landowners argue the case for the use of alternative accesses. The ExA is persuaded by the Applicant's view that maintaining the original CA powers would ensure that if unknown rights were to surface later that might prevent the alternative accesses, then there would still be the original CA powers to fall back on which in the ExA's view, creates certainty.
- 8.16.59. The rDCO does not currently provide a mechanism for CA and TP powers not to be used if an alternative access is used. If the SoS is minded to make the Order and grant powers of acquisition, they may wish to satisfy themselves on this matter.
- 8.16.60. Previously in this Chapter, the ExA has concluded that should the SoS be minded to make the Order, the powers requested would be for a legitimate purpose, necessary for the Proposed Development and proportionate and that suitable compensation mechanisms exist to address any adverse effects on the land. Should the SoS be minded to make the Order, the ExA advises that CA and TP powers could be granted in relation to the Objectors identified in Table 2.

Issues raised by Objectors not represented by the NFU/LIG

- 8.16.61. A number of objectors not represented by the NFU/LIG, raised individual matters.

- 8.16.62. The CAOS details the relevant plots and whether the Applicant is seeking CA or TP of land and/or rights in relation to each objector. The CAOS also confirms the status of negotiations in respect of HoT agreements, as evidenced in the Applicant's final form CAOS [REP18-028].

Objection 2 – Brown and Co on behalf of Necton Farms Ltd [RR-009]

- 8.16.63. Necton Farms Ltd is owned by the landowner of the majority of the proposed onshore project substation site and National Grid substation extension site. Necton Farms Ltd is the occupier and farming business on the land.
- 8.16.64. Category 1 owners are Michael Anthony King and Caroline Ann Tomkins. Category 2 owners are National Grid, David Haydn King, Joyce Marina King, Colin King, Jacqueline Ann Claxton, Paul John King [BoR].
- 8.16.65. Many of the objectors' concerns have been addressed in this Chapter and Chapter 5 of this Recommendation Report as follows:
- a. impact on Necton Farms' farming business during construction, reported in this Chapter and in Section 5.8 of this Recommendation Report;
 - b. disruption to accessibility of the farm reported in this Chapter of the Recommendation Report;
 - c. irregular field shapes, reported in Section 5.8 of this Recommendation Report;
 - d. land taken out of production for work to pylons, reported in Section 5.8 of this Recommendation Report;
 - e. impact on the farm business due to decrease in farm size, reported in this Chapter of this Recommendation Report; and
 - f. devaluation, in monetary terms, of the retained farm; which entails loss of amenity value of the farm and decreased agricultural value due to the effects on the layout of the farm, changes in field shapes, accessibility of the farm, reported in this Chapter of this Recommendation Report [RR-009].
- 8.16.66. In its response to Relevant Representations [AS-024] the Applicant stated it was continuing to engage with the landowner to reach agreement by negotiation where possible.
- 8.16.67. In WQ2 [PD-009, Q2.3.0.30], the ExA requested all objectors including Necton Farms Ltd (and/or their respective agents) identified in the CAOS subject to the CA of their land or rights, to:
- confirm whether they maintained an objection, providing specific details of the reasons why they object, in relation to the individual's specific land/rights that would be affected by CA;
 - provide an update on discussions with the Applicant and whether they anticipate that agreement was likely to be reached between the parties before the end of the Examination; and
 - confirm if agreement had been reached and the objection resolved.

- 8.16.68. No response was received from Necton Farms Ltd (or its agent). The ExA issued a Rule 17 request on 10 September requesting the Applicant to provide a detailed response to the points raised by Necton Farms Ltd in its Relevant Representation and that Necton Farms Ltd (or their respective land agent) should respond to the Applicant's comments [PD-025].
- 8.16.69. The Applicant provided a full response [REP16-004]. It explained that it sought to acquire rights under two Option Agreements:
- for the proposed onshore substation areas and the creation of the National Grid substation extension. HoTs had been agreed and signed; and
 - for the cable easement rights. Given the involvement of National Grid and TC Dudgeon OFTO plc, this agreement was less advanced although the drafting of an option agreement was progressing in parallel to agreement over HoTs and the Applicant was anticipating agreement to be reached.
- 8.16.70. The Applicant confirmed that it had agreed to purchase additional land from the landowner in the vicinity of the onshore project substation and National Grid substation extension areas to leave practical, workable field edges and to avoid leaving any awkward residues or unworkable parcels of land post-construction.
- 8.16.71. In relation to the cable easement land, the Applicant confirmed it would purchase additional land from the landowner, should the landowner request this, in the event that the residual land parcel was unworkable or impractical to farm.
- 8.16.72. Furthermore, the Applicant confirmed that the terms of the agreement provided for the landowner to be compensated for the overall reduction in the farm holding, including any effect this reduction would have on the operation of the remaining farm holding.
- 8.16.73. The Applicant stated that it had agreed access provisions that would enable Necton Farms Ltd to continue to farm the unit throughout the construction period and to ensure the access routes to be provided did not hinder the operation of the farming business.
- 8.16.74. The Applicant stressed that *"Necton Farms and the Landowners had engaged constructively and willingly with Vattenfall at all stages of discussions and negotiations; the reason that the Agreements are not quite complete at the time of this response is due to complexities of the Project, as opposed to any stalling of negotiations"* [REP16-004].
- 8.16.75. The ExA did not receive a representation from Necton Farms Ltd (or its agent) in response to the Applicant's submission.

Objection 9 Paul King

- 8.16.76. Paul King's Relevant Representation covered a number of matters. The ExA has addressed many of these in Chapter 5 of this Recommendation Report as detailed below:
- a. flooding of Ivy Todd causing risk to people and wildlife, reported in Section 5.7 of this Recommendation Report;
 - b. noise and disruption during construction and after completion, to Chapel Road and Ivy Todd, reported in Section 5.5;
 - c. disruption to Norfolk more generally due to land being dug up from the coast to Necton, reported in Section 5.4;
 - d. health risks associated with magnetic field emitted from the substation, reported in Section 5.8; and
 - e. light pollution from such a large area, reported in Section 5.3 and referred to in Section 5.4 of this Recommendation Report [RR-038].
- 8.16.77. The objector also raised concerns about the effect of the Proposed Development on his five-van caravan- and motorhome club site and devaluation of that property.
- 8.16.78. The ExA asked the Applicant to confirm whether the Ivy Todd Campsite owned by Mr Paul King in Ivy Todd been identified in the BoR [PD-009 2.3.0.33]. The Applicant confirmed that the campsite business was not referred to within the BoR as it was not included within the Order limits [REP5-045].
- 8.16.79. In WQ2 [PD-009, Q2.3.0.30], the ExA requested all objectors identified in the CAOS subject to the CA of their land or rights, to:
- a. confirm whether they maintained an objection, providing specific details of the reasons why they object, in relation to the individual's specific land/rights that would be affected by CA;
 - b. provide an update on discussions with the Applicant and whether they anticipate that agreement was likely to be reached between the parties before the end of the Examination; and
 - c. confirm if agreement had been reached and the objection resolved.
- 8.16.80. Towards the end of the Examination, the ExA repeated the request. The objector did not provide representations in response.

Objection 55 Colin King

- 8.16.81. This objector maintains an ongoing objection to the CA of the easement rights over a number of specific plots relating to land for the substations at Necton [REP8-035; REP16-018].
- 8.16.82. Whilst the Applicant confirmed that there were third party historic rights listed on the owner's title, the area of land over which these rights exist within the landowner's title was not known. The Applicant had investigated these rights and requested the Land Registry to provide copies, but the Land Registry confirmed that no copies were lodged of the conveyance on first registration and there was no plan available to show the precise locations referred to.

- 8.16.83. The Applicant stated that if Mr Colin King was able to provide evidence of what type of rights exist over the affected land, it would seek to acquire these rights by agreement. If an agreement was unable to be reached, the Applicant would seek to utilise any compulsory powers awarded [REP9-011].
- 8.16.84. At various points during the Examination, the ExA questioned the progress being made by the parties to resolve the issue including WQ2 [PD-009, Q2.3.0.26], and a Rule 17 question [PD-025]. In response, Colin King stated that there was continuing objection to easement rights over the listed plots: *"...as no agreement, or terms of agreement have been offered. The applicant is undecided about these easements, as there is little detail with the land registry, and a paper copy cannot be found. If they are to be ignored, I ask for clarity, or proof of their non-existence"* [REP16-018].
- 8.16.85. The Applicant restated its position adding that no further information had been forthcoming [REP17-004].

Objection 56 Clan Farms Ltd

- 8.16.86. This objector's concerns relate to access provisions; aftercare of land and compensation, communications with farmers; the location of link and jointing boxes; and effects on the coastline of the proposed cable and timing of the pipework installation in relation to Norfolk Vanguard OWF [RR-108].
- 8.16.87. The Applicant's response to the issues raised by this objector is set out in [AS-024]. The Applicant confirmed that HoTs had also been agreed with the owner of the land and that it was in negotiation with the objector to agree an occupier's consent including compensation payable.

Objection 61 Gorgate Ltd

- 8.16.88. Whilst the company did not submit representations to the Examination directly, the NFU/LIG identified in response to WQ3 that Gorgate Ltd were concerned about the effects of the Proposed Development on its blackcurrant planting activities [REP7-042, Q3.3.0.14]. The Applicant replied in detail confirming that matters were resolved between the parties and HoTs had been agreed and signed as evidenced in the CAOS [REP8-015].

Objection 62 Christian Henry Allhusen and Penelope Amanda Allhusen (Also Objection 26 Bradenham Hall Farms)

- 8.16.89. Objector 62 is the owner and occupier of Bradenham Hall Farms. In addition to being party to the generic Relevant Representation made by NFU/LIG [RR-058], this objector also raised a number of matters directly during the Examination, including the choice of site, a possible alternative at Top Farm, effectiveness of bunding and planting, consultation and engagement on proposed substations at Necton, the Design Guide and the process that would be adopted for involving landowners in post-consent approvals and the role of the local authority.

The ExA has addressed these matters in Section 5.3 of this Recommendation Report.

- 8.16.90. In addition, the objector raised concerns relating to future access arrangements for large machinery to an adjacent land parcel in the same ownership, stating that a straight edged 12m wide strip (at the narrowest point) would be necessary.
- 8.16.91. The Applicant reported that it had agreed to exclude planting or other constraints to access to address this concern and offered to secure this through private agreement with the landowner [REP13-015, Ref 18]. A plan illustrating the 12m exclusion area was submitted [REP13-020] and incorporated in the mitigation planting plan for the Scenario 1 onshore project substation in the updated Design and Access Statement (DAS) [REP14-019]. This still showed a curved edge, but the Applicant explained that this was the minimum area for planting exclusion, not a fencing line [REP15-003, Q5.9.5.1].
- 8.16.92. The ExA notes in the final form CAOS that HoTs for an option agreement for the cable easement were agreed and signed between the Applicant and the landowner and that discussions are stated to be underway between legal teams to agree the wording of the Option and Deed documentation [REP8-015].
- 8.16.93. Formal HoTs for an Option Agreement for acquisition of land from the landowner had been issued by the Applicant and negotiations were ongoing at the close of the Examination. The Applicant expressed its view that it was hopeful the necessary land and rights could be acquired by agreement [REP8-015].

Objection 63 Christian Henry Allhusen, Penelope Amanda Allhusen, William Patrick Durlacher, Bartholomew Guy Peerless

- 8.16.94. The ExA has considered the representations made by Christian Henry Allhusen and Penelope Amanda Allhusen under Objection 62.
- 8.16.95. The ExA notes from the CAOS that in relation to this location, HoTs have been agreed and signed between the parties [REP8-015].

ExA's consideration of individual objections

- 8.16.96. For the reasons stated in Chapter 7 of this Recommendation Report, the ExA has reached the view that there is not a compelling case in the public interest for the powers of CA or TP to be granted.
- 8.16.97. However, should the SoS take a different view, the ExA considers that in general, the Applicant has provided extensive evidence of ongoing dialogue between the parties to reach a negotiated agreement as summarised in the CAOS.

Necton Farms Ltd (Objection No 2)

- 8.16.98. The ExA has considered the Relevant Representation submitted on behalf of Necton Farms Ltd and the Applicant's detailed response which the ExA considers addresses the concerns of the objector.
- 8.16.99. In any event, the ExA is satisfied with the Applicant's case in relation to its approach to the location and construction of the onshore project substation and National Grid substation extension for Scenario 1 or Scenario 2 and has given consideration to the matter of alternative sites as raised by IPs. The ExA is satisfied with the required land-take in the light of the general effects of CA and TP. The ExA is satisfied that interference with the objector's land and rights would be necessary for the Proposed Development.
- 8.16.100. Previously in this Chapter, the ExA has concluded that should the SoS be minded to make the Order, the powers requested would be for a legitimate purpose, necessary for the Proposed Development and proportionate and that suitable compensation mechanisms exist to address any adverse effects on the land. Should the SoS be minded to make the Order, the ExA advises that CA and TP powers could be granted.

Paul King (Objection No 9)

- 8.16.101. The ExA has addressed many of the matters raised by Paul King in Chapter 5 of this Recommendation Report. If there should be any impact on the Ivy Todd Campsite and its value, and since no land is taken, this is a matter that relates only to compensation and is outside the ExA's consideration under PA2008.
- 8.16.102. In so far as devaluation of property is concerned, compensation mechanisms exist to address any adverse effect on property, if proved.
- 8.16.103. As set out previously, the ExA is satisfied with the Applicant's case that the general effects of CA were considered in relation to its approach to the location and construction of the onshore project substation for Scenario 1 or Scenario 2. We are therefore satisfied that interference with the objector's land and rights is necessary for the proposed development.
- 8.16.104. Previously in this Chapter, the ExA has concluded that should the SoS be minded to make the Order, the powers requested would be for a legitimate purpose, necessary for the Proposed Development and proportionate and that suitable compensation mechanisms exist to address any adverse effects on the land. Should the SoS be minded to make the Order, the ExA advises that CA and temporary use powers could be granted.

Colin King (Objection No 55)

- 8.16.105. From the evidence provided during the Examination, the ExA is satisfied that the Applicant has been diligent in trying to identify all existing rights.

- 8.16.106. In the situation reached at the end of the Examination, given the uncertainty over what the potential rights are, the ExA agrees that reaching agreement is not possible. If at some later date the conveyance is found, then then this situation could be reviewed, and the Applicant might not then need to exercise CA powers.
- 8.16.107. If landowners were to come forward at a later date, the ExA is satisfied that they would not be prejudiced as the impact of the acquisition of their land had been considered and they would have six years from the date of vesting to agree compensation, and apply to the Upper Tribunal (Lands Chamber) for a hearing, giving them a 'fair trial' in line with Article 6 of the European Convention on Human Rights
- 8.16.108. Previously in this Chapter, the ExA has concluded that should the SoS be minded to make the Order, the powers requested would be for a legitimate purpose, necessary for the Proposed Development and proportionate and that suitable compensation mechanisms exist to address any adverse effects on the land. Should the SoS be minded to make the Order, the ExA advises that CA and temporary use powers could be granted.

Clan Farms Ltd (Objection 56)

- 8.16.109. Many of the matters raised by this objector have been addressed in Chapter 5 of this Recommendation Report.
- 8.16.110. The ExA notes that the confirmation by the Applicant that HoTs had been agreed with the owner of the land and that it was in negotiation with the objector to agree an occupier's consent including compensation payable. In so far as compensation is concerned, the ExA is satisfied that compensation mechanisms exist to address any adverse effect on property although this is outside the ExA's consideration under PA2008.
- 8.16.111. Previously in this Chapter, the ExA has concluded that should the SoS be minded to make the Order, the powers requested would be for a legitimate purpose, necessary for the Proposed Development and proportionate and that suitable compensation mechanisms exist to address any adverse effects on the land. Should the SoS be minded to make the Order, the ExA advises that CA powers could be granted.

Gorgate Ltd (Objection 61)

- 8.16.112. The ExA is satisfied that the route for the onshore cable corridor has been chosen in the light of general effects from CA and TP. The ExA is therefore satisfied that interference with the objector's rights is necessary for the Proposed Development. Any adverse effects on the rights, if proved, could give rise to a claim for compensation.
- 8.16.113. Previously in this Chapter, the ExA has concluded that should the SoS be minded to make the Order , the powers requested would be for a legitimate purpose, necessary for the Proposed Development and proportionate and that suitable compensation mechanisms exist to address any adverse effects on the land. Should the SoS be minded to

make the Order, the ExA advises that CA and temporary use powers could be granted.

Christian Henry Allhusen and Penelope Amanda Allhusen (Objection 62) and Bradenham Hall Farms (Objection 26)

- 8.16.114. Savills on behalf of Objector 26; 62 and 63 invited the ExA to view aspects of the Proposed Development from its land [REP1-062]. Objector 62 joined part of the first ASI as it visited Bradenham Hall Farms' land, accompanying the ExA to view the position of the north east corner of the proposed site for the project substation under Scenario 1. The ExA observed the hedgeline boundary between land owned by the objector and that in an adjacent landownership, which would also be required for the project substation. Features of the Proposed Development had been pegged out on the land by the Applicant, including the north east corner of the proposed project substation under Scenario 1 [EV8-002].
- 8.16.115. In response to WQ5, the Applicant confirmed that the area pegged out on the ASI was the north east corner of the proposed onshore project substation footprint under Scenario 1 and added for clarity, that under Scenario 2, no part of the Norfolk Boreas onshore project substation footprint would extend into the land holding viewed on the ASI [REP5-045, Q2.9.7.3]. At the ExA's request, the Applicant provided plans with detailed contours, elevations and cross sections of the area proposed for the onshore project substation [RE5-045, Q2.9.3.3] and [REP5-047]. The Applicant explained that its approach to siting the substation would minimise cut and fill and establish the median on which to construct the platform for the buildings and infrastructure, which it argued justified the location.
- 8.16.116. The ExA is also satisfied with the Applicant's case that the general effects of CA were considered in relation to its approach to the location of the onshore project substation for Scenario 1 where permanent freehold acquisition rights are being sought. The ExA is therefore satisfied that interference with the objector's land and rights is necessary for the Proposed Development in Scenarios 1 and 2.
- 8.16.117. Previously in this Chapter, the ExA has concluded that should the SoS be minded to make the Order, the powers requested would be for a legitimate purpose, necessary for the Proposed Development and proportionate and that suitable compensation mechanisms exist to address any adverse effects on the land. Should the SoS be minded to make the Order, the ExA advises that CA powers could be granted.

Christian Henry Allhusen, Penelope Amanada Allhusen, William Patrick Durlacher, Bartholomew Guy Peerless (Objection 63)

- 8.16.118. See the ExA's reasoning in relation to Objector 62. Previously in this Chapter, the ExA has concluded that should the SoS be minded to make the Order, the powers requested would be for a legitimate purpose, necessary for the Proposed Development and proportionate and that suitable compensation mechanisms exist to address any adverse effects

on the land. Should the SoS be minded to make the Order, the ExA advises that CA powers could be granted.

Category 3 Parties

- 8.16.119. Objections under Category 3 are those parties that have no legal interest in the land but may be affected by the construction or use of the works. These might also include objections to the application for powers of TP or objections to the grant of CA powers by those who may be able to make a claim under section 10 of the Compulsory Purchase Act 1965 or Part I of the Land Compensation Act 1973.
- 8.16.120. Relevant Representations received by the ExA where no powers of acquisition are being sought have been identified in the CAOS. These are Objectors 1, 3, 4, 6, 7, 8, 12, 16, 47 and 54. These parties object on a range of issues arising from the construction and operation of the Proposed Development. In addition to Relevant Representations, many of these objectors were actively engaged throughout the Examination and the matters they raised have been addressed in Chapter 5 of this Recommendation Report.
- 8.16.121. The ExA has been concerned to ensure that there are appropriate mitigation measures in place in respect to potential adverse effects during construction and operation (as considered in Chapter 5); and appropriate compensation provisions in place via Section 10 of the Compulsory Purchase Act 1965 or Part 1 of the Land Compensation Act 1973 provide the route by which claims can be made.

8.17. EXA's CONSIDERATION OF THE CA ISSUES

- 8.17.1. The ExA's approach to the question whether and what CA powers it should recommend to the SoS to grant has been to seek to apply the relevant sections of the PA2008, notably s122 and s123, DCLG CA Guidance, and the Human Rights Act 1998; and, in the light of the representations received and the evidence submitted, to consider whether a compelling case has been made in the public interest, balancing the public interest against private loss.
- 8.17.2. The ExA understands, however, that the case for CA powers cannot properly be considered unless and until the ExA has formed a view on the case for the development overall, and the consideration of the CA issues must be consistent with that view.
- 8.17.3. The ExA has shown in the Chapter 7 of this Recommendation Report that it has reached the view that development consent should not be granted in either of the two scenarios put forward by the Applicant. Should the SoS agree with those conclusions then the case for the powers sought in the dDCO falls away.
- 8.17.4. However, in the event that the SoS takes a different view on either or both of the two scenarios for development, the ExA has addressed the

extent to which the case is made for CA powers necessary to enable the Proposed Development to proceed. The considerations below apply to both scenarios, although there are differences in the land which would be required for CA and TP for the two scenarios.

- 8.17.5. To reach a judgement on this requirement the approach the ExA took was to examine:
- a. the case which was made for the grant of CA and TP powers in respect of the plots included in the BoR;
 - b. the Applicant's justification for the inclusion of the plots as set out in the SoR;
 - c. the Applicant's justification of its financial position as set out in the Funding Statement;
 - d. the type and extent of interests sought;
 - e. the stated use of the Order land and whether the proposals are clear and necessary;
 - f. DCO provisions; and
 - g. the potential effects and consequences of taking the land proposed.
- 8.17.6. In addition, the ExA has also considered the case made for Crown Land, National Trust Land, Open Space, Statutory Undertakers' undertakings, human rights and the compelling case in the public interest and individual objections and issues.
- 8.17.7. The ExA's conclusions on the public interest and human rights issues are predicated on the SoS finding that the national need for a project of the type that is the subject of the application represents a substantial public interest argument in its favour, as noted above.
- 8.17.8. In considering whether there is a compelling case in the public interest, when balancing these against the private loss that would occur, the ExA has given weight to the extensive negotiations that have taken place between the Applicant and Affected Persons and the subsequent progress that has been made in reaching private agreements.
- 8.17.9. For the reasons set out in Chapter 7, the ExA is of the view that the Proposed Development does not align with EN1; EN3 and EN5 (in so far as it relates to the electrical infrastructure) and that the case for development is not made. However, if the SoS determines a different view then the issues in relation to human rights are set out below.
- 8.17.10. Turning to consideration of specific plots and specific parties the ExA has had particular regard to Article 1 of the First Protocol to the European Convention on Human Rights, as embodied in the Human Rights Act 1998, which states that:

"Every natural or legal person is entitled to the peaceful enjoyment of his possessions. No one shall be deprived of his possessions except in the public interest and subject to the conditions provided for by law and by the general principles of international law. The preceding provisions shall not, however, in any way impair the right of a State to enforce such laws

as it deems necessary to control the use of property in accordance with the general interest or to secure the payment of taxes or other contributions or penalties.”

- 8.17.11. The ExA has also had regard to Article 8 dealing with the right to respect for private and family life. None of the applications for CA relate to the CA of a house or dwelling or to significant temporary interference with a house or dwelling. Nor has any of the Affected Persons raised the concern as to the unviability of their livelihood as a result of the potential CA or TP powers.
- 8.17.12. In respect of Article 6, the ExA concludes that the process of examining this application, including the opportunities to submit representations, a series of WQs and the opportunities to be heard at hearings, all mean that those whose rights may be affected have been given access to a fair and public hearing within a reasonable time by an independent and impartial tribunal established by law.

8.18. CONCLUSIONS

- 8.18.1. The Applicant has shown that all reasonable alternatives to CA have been explored and that there are no alternatives which ought to be preferred.
- 8.18.2. The ExA is also satisfied that the legal interests in all plots described and set out in the BoR and on the Land Plans would be required for the Proposed Development and that the land to be taken is no more than is reasonably required and is proportionate to the needs of the Proposed Development.
- 8.18.3. In so far as funding is concerned, the ExA is satisfied that there is security of funding for the implementation of the Proposed Development, however the SoS may wish to obtain and consider the 2019 accounts for VWPL and the Parent Company, plus a statement of any material changes in the ownership structure of the Applicant, VWPL and the Parent Company that have taken place since the publication of the last accounts including effects of the coronavirus pandemic on the Vattenfall business, share price and ability to raise funds. The signed Funding Agreement with the Parent Company provides some certainty about funding for CA liabilities should the Order be made. However, as the Applicant did not disclose specific values due to commercial sensitivity, the SoS is advised to satisfy themselves on this matter. The SoS may also wish to be satisfied that prior to the granting of any CA powers, the requisite funding has been secured by the Applicant and would be available to enable CA within the statutory period following the Order being made.
- 8.18.4. With regard to s122(2) of PA2008, the ExA is satisfied that the land is required for the development to which the development consent relates or is required to facilitate or is incidental to that development.

- 8.18.5. With regard to s122(3) of PA2008, the condition is that there is a compelling case in the public interest for the land to be acquired compulsorily which means that the public benefit derived from the CA must outweigh the private loss that would be suffered by those whose land is affected. In balancing public interest against private loss, CA must be justified in its own right. But this does not mean that the CA proposal can be considered in isolation from the wide consideration of the merits of the project. There must be a need for the Proposed Development to be carried out and there must be consistency and coherency in the decision-making process.
- 8.18.6. The ExA has set out its findings in relation to the Case for Development in Chapter 7 of this Recommendation Report. It concluded that the Case for Development is not made. The ExA therefore considers that the proposed interference with the human rights of individuals would not be for a legitimate purpose that would justify such interference in the public interest.
- 8.18.7. Should the SoS reach a different conclusion, the ExA considers that the private loss to those affected has been mitigated to a large degree through the selection of the application land, the use of TP to minimise permanent land-take and the extent of the rights and interests proposed to be acquired and that the proposed interference with the human rights of individuals would be for a legitimate purpose, proportionate and justified in the public interest. The ExA is also satisfied that there is no evidence that the Proposed Development would not accord with the Equality Act 2010.
- 8.18.8. Taking these factors together, and only subject to the Order being made, the SoS can be satisfied that there is a compelling case in the public interest for the CA and other powers sought in respect of the land shown on the Land Plans. In respect of CA, the ExA concludes that the proposal would comply with s122(3) of the PA2008, that the powers can be justified and that they would not represent a disproportionate interference with the human rights of the affected parties. Similarly, in respect of statutory undertakers, that no element of the powers would substantially interfere with their ability to carry out their statutory duties.

9. DRAFT DEVELOPMENT CONSENT ORDER AND RELATED MATTERS

9.1. INTRODUCTION

- 9.1.1. This chapter reports on the draft Development Consent Order (dDCO) and related matters under the following subsections:
- a. the dDCO as applied for, setting out in tabular form the provisions where changes have or have not occurred between that applied for and that included by the ExA in its recommended Development Consent Order (rDCO) (Appendix D);
 - b. commentary on the dDCO, not covered elsewhere in this Recommendation Report;
 - c. other consents; and
 - d. other agreements.
- 9.1.2. Reporting of reasons for suggested changes and reporting of differences of opinion which led to no change are set out in Chapter 5 for topic-based matters, Chapter 6 for HRA matters, Chapter 8 for matters relating to Compulsory Acquisition (CA) and Temporary Possession (TP) and in Chapter 9 below for those relating to certain articles, certifications and consenting procedures.

9.2. THE dDCO AS APPLIED FOR

- 9.2.1. The application included a dDCO [APP-020], an Explanatory Memorandum [APP-021], a Note on Requirements and Conditions in the DCO [APP-022] and a DCO/ EIA reconciliation document [APP-689].
- 9.2.2. The ExA looked into the detail of the structure and effectiveness of the dDCO through written and oral questions including at four Issue Specific Hearings (ISH) as follows:
- Development Consent Order ISH on 13 November 2019 (ISH1) [EV3-001] to [EV3-005];
 - Onshore Effects and Development Consent Order ISH on 21 January 2020 (ISH3) [EV6-001] to [EV6-006];
 - Offshore Effects and Development Consent Order ISH on 22 January 2020 (ISH4) [EV7-001] to [EV7-005]; and
 - Draft Development Consent Order and other matters on 24 July 2020 [EV14-001] to [EV14-004].
- 9.2.3. At ISH1, the Applicant explained why it had included both scenarios in one dDCO and how and where the two scenarios are dealt with in the dDCO [EV3-003], [REP1-0141, item 2]. This is as follows:
- a. the Works descriptions and definitions set out different work for each scenario;

- b. the Articles, where all Articles are required for both scenarios, save for Article 4 which relates to limits of deviation for the overhead line and is therefore only required for Scenario 2;
- c. the Requirements, which generally relate to both scenarios. Requirement 15 deals with the scenarios explicitly, requires notification of the scenario to be taken forward and states that Scenario 1 must be taken forward in the event that Norfolk Vanguard OWF is commenced;
- d. the Schedules containing works to streets, public rights of way and hedges (Schedules 2, 3, 4, 14) which contain separate parts relating to each scenario;
- e. the CA schedules (Schedules 5, 6, 7, 8) which contain separate parts relating to each scenario; and
- f. the DMLs, which contain notification requirements for the scenarios at Condition 8 of the Generation Licences (Schedules 9 and 10) and Condition 3 of the Transmission Licences (Schedules 11 and 12).

9.2.4. After the explanation, the ExA was content with the way in which the Applicant had dealt with two scenarios in the one dDCO.

9.2.5. The ExA welcomed the Applicant's helpful response to the request to ensure that the Explanatory Memorandum followed best practice drafting guidance from the Planning Inspectorate's Advice Note 15¹⁴. Subsequent submissions of the Explanatory Memorandum included a schedule in tabular format setting out compliance with Planning Inspectorate Advice Note 15 [REP18-012, Schedule 4].

9.3. CHANGES TO THE dDCO DURING EXAMINATION

9.3.1. The Applicant submitted updated (clean and track changed) dDCOs with explanatory memoranda, schedules of changes to the dDCO and DCO/ EIA reconciliation documents at Deadline 0 (D0), D1, D4, D5, D7, D10 and D11, D13, D14 and D18. A Note on Requirements and Conditions document was also submitted at D4, D5, D11 and D18.

- Deadline 0: [AS-019] to [AS-023].
- Deadline 1: [REP1-008], [REP1-009], [REP1-016], [REP1-017].
- Deadline 4: [REP4-003] to [REP4-008].
- Deadline 5: [REP5-003] to [REP5-005], [REP5-008], [REP5-009].
- Deadline 7: [REP7-003], [REP7-004], [REP7-014].
- Deadline 10: [REP10-003] to [REP10-007], [REP10-010], [REP10-011], [REP10-030].
- Deadline 11: [REP11-003], [REP11-004].
- Deadline 13: [REP13-007] to [REP13-012].
- Deadline 14: [REP14-010], [REP14-011].
- Deadline 18: [REP18-009] to [REP18-014], [REP18-027].

¹⁴ Planning Inspectorate: Advice Note Fifteen: Drafting Development Consent Orders

- 9.3.2. The final documents submitted by the Applicant by the close of the Examination were:
- dDCO (clean, track changed, and all track changes from application dDCO) [REP18-009], [REP18-010], [REP18-011];
 - Explanatory Memorandum clean and track changed [REP18-012], [REP18-013];
 - Schedule of Changes to the dDCO [REP18-027];
 - Note on Requirements and Conditions in the DCO [REP18-014]; and
 - DCO/ EIA reconciliation document [REP14-011].
- 9.3.3. The Applicant's final dDCO comprised the contents set out below and the rDCO follows an identical structure:
- PART 1: Preliminaries.
 - PART 2: Principal Powers.
 - PART 3: Streets.
 - PART 4: Supplemental Powers.
 - PART 5: Powers of Acquisition.
 - PART 6: Operations.
 - PART 7: Miscellaneous and General.
- 9.3.4. There are 19 schedules as follows:
- SCHEDULE 1: Authorised Project.
 - SCHEDULE 2: Streets subject to Street Work.
 - SCHEDULE 3: Public Rights of Way to be temporarily stopped up.
 - SCHEDULE 4: Streets to be stopped up.
 - SCHEDULE 5: Access to Works.
 - SCHEDULE 6: Land in which only New Rights etc., may be acquired.
 - SCHEDULE 7: Modification of compensation and compulsory purchase enactments for creation of new rights.
 - SCHEDULE 8: Land of which temporary possession may be taken.
 - SCHEDULE 9: Deemed Licence under the 2009 Act – Generation Assets (Licence 1 – Phase 1).
 - SCHEDULE 10: Deemed Licence under the 2009 Act – Generation Assets (Licence 2 – Phase 2).
 - SCHEDULE 11: Deemed Licence under the 2009 Act – Transmission Assets (Licence 1 – Phase 1).
 - SCHEDULE 12: Deemed Licence under the 2009 Act – Transmission Assets (Licence 2 – Phase 2).
 - SCHEDULE 13: Deemed Licence under the 2009 Act –Project Interconnector assets (Scenario 1).
 - SCHEDULE 14: Hedgerows.
 - SCHEDULE 15: ARBITRATION RULES.
 - SCHEDULE 16: Procedure for discharge of Requirements.
 - SCHEDULE 17: PROTECTIVE PROVISIONS.
 - SCHEDULE 18: Documents to be Certified.
 - [SCHEDULE 19: Compensation to protect the coherence of the Natura 2000 network]. (This Schedule has square brackets because inclusion or otherwise of this drafting would be based on the SoS decision regarding compensation. The ExA has recommended its inclusion).

9.4. COMPARISON OF DIFFERENCES BETWEEN dDCO AND rDCO

- 9.4.1. This part of the Recommendation Report addresses all provisions in the Applicant's application dDCO and tabulates how those compare with the ExA's rDCO in three tables:
- **Table 1** sets out provisions in the rDCO which are not recommended for change from the application version of the dDCO [APP-020].
 - **Table 2** sets out the provisions where there are minor changes or changes consequential to another change between the application version of the dDCO and the rDCO. The provision is listed with a cross reference to the explanation in the Schedule of Changes to the dDCO [REP18-027].
 - **Table 3** sets out contentious provisions where there was substantive discussion between the Applicant and/or other IPs and the ExA about potential changes to drafting. The detailed reporting of these matters is provided in relevant sections of this Recommendation Report (Chapter 4, Sections within Chapter 5, Chapter 6 and Chapter 8). Table 3 signposts where the detailed reporting is provided. It also captures any minor drafting amendments related to that provision.
- 9.4.2. In some instances, provisions are listed in Table 1 and Table 3. This occurs when the ExA's recommendation is to include a provision in the rDCO which does not change that set out in the application dDCO, but where issues have been raised either by the ExA or others, which have been reported upon.
- 9.4.3. Some of the explanations regarding the changes in the Schedule of Changes to the dDCO are set out as "*to carry across changes from the Norfolk Vanguard as made Order and ensure consistency between the two projects/DCOs*" [REP18-027]. The ExA has reviewed each of these proposed changes and incorporated them where it considers they are appropriate and necessary. The ExA does not accept that consistency between the two project Orders would always be necessary because the Proposed Development is considered on its own merits. In places the ExA has recommended different wording, with reasoning given in the relevant section of Chapter 5, 6 or 8 of this Recommendation Report and included them in Table 3.

Table 1: dDCO provisions not recommended to be changed

- 9.4.4. **Table 1** sets out provisions in the rDCO which are not recommended for change from the application version of the dDCO [APP-020].

Table 1: dDCO Provisions Not Recommended to be Changed

Table 1: Provisions not recommended to be changed
PART 1 Preliminary (Articles)
Article 2: Interpretation (many definitions are not changed, also minor amendments cited in Table 2 below and amendments that are the subject of ExA reasoning are in Table 3)
PART 2: Principal Powers
Article 3: Development consent etc. granted by the Order
Article 4: Limits of Deviation
Article 5: Power to construct and maintain authorised project
PART 3: Streets
Article 10: Public rights of way
Article 12: Access to works
Article 13: Agreements with street authorities
PART 4: Supplemental Powers
Article 17: Removal of human remains
PART 5: Powers of Acquisition
Article 18: Compulsory Acquisition of land
Article 24: Acquisition of subsoil or airspace only
Article 28: Extinguishment of private rights and restrictive covenants relating to apparatus removed from land subject to temporary possession
Article 29: Statutory undertakers
PART 6: Operations
Article 31: Operation of generating station
PART 7: Miscellaneous and General
Article 41: Saving provisions for Trinity House
Article 43: Protective Provisions
SCHEDULE 1: PART 1, Authorised Development
Work No. 2
Work No. 3A
Work No. 3B
Work No. 4A

Table 1: Provisions not recommended to be changed
Work No. 4B
Work No. 4C
Work No. 5
Work No. 6
Work No. 7
Work No. 8A
Work No. 8B
Work No. 9
Work No. 10A
Work No. 10B
Work No. 10C
Work No. 11A
Work No. 11B
Work No. 12A
Work No. 12B
The grid coordinates for that part of the authorised project which is seaward of MHWS
SCHEDULE 1: PART 2, Ancillary Works (all)
SCHEDULE 1: PART 3, Requirements
Requirement 1: Time limits
Requirement 4: Detailed offshore design parameters
Requirement 6: Detailed offshore design parameters
Requirement 7: Detailed offshore design parameters
Requirement 8: Detailed offshore design parameters
Requirement 8: Detailed offshore design parameters
Requirement 10: Detailed offshore design parameters
Requirement 13: Ministry of Defence surveillance operations
Requirement 14: Offshore decommissioning
Requirement 22: Highway accesses
Requirement 29: Onshore decommissioning

Table 1: Provisions not recommended to be changed
Requirement 32: Operational Drainage Plan
Requirement 33: Skills and employment strategy
Requirement 35: Reuse of temporary works in the event of scenario 1
SCHEDULE 2: Streets subject to Street Works
SCHEDULE 3: Public Rights of Way to be temporarily stopped up
SCHEDULE 4: Streets to be stopped up
SCHEDULE 5: Access to Works
SCHEDULE 9, PART 2
SCHEDULE 9, PART 4, Conditions 2, 4, 5, 7, 10, 11, 13, 17, 21,
SCHEDULE 10, PART 4, Conditions 2, 4, 5, 7, 10, 11, 13, 17, 21
SCHEDULE 11, PART 4, Conditions 1, 5, 6, 8, 16, 18
SCHEDULE 12, PART 4, Conditions 5, 6, 8, 16, 18
SCHEDULE 13, PART 4, Conditions 1, 4, 6, 10, 11, 12, 14, 15

Table 2: Minor amendments to dDCO

- 9.4.5. Table 2 sets out the provisions where there are minor changes or changes consequential to another change between the final version of the dDCO [REP18-009] and the rDCO.
- 9.4.6. The provision is listed with a cross reference to the explanation provided in the Schedule of Changes to the dDCO submitted by the Applicant [REP18-027]. The ExA agrees with the Applicant's explanation set out in REP18-027 and it is therefore not replicated in Table 2.

Table 2: Minor amendments to dDCO [REP18-009]

Table 2: Provision for change	Explanation
Front page	
Year changes to 2021	[REP18-027, Ref 121] The ExA is content with drafting and has included in the rDCO.
Contents	
Page #s, titles etc	Updates. The ExA is content with drafting and has included in the rDCO.
Preamble	
Preamble	[REP18-027, Ref 122] The ExA is content with drafting and has included in the rDCO subject to correction of "order" to "Order" (capitalised) in the first paragraph of the Preamble. The ExA includes this change in the rDCO.
Preambles footnotes page 4	[REP18-027, Ref 123] The ExA is content with drafting and has included in the rDCO.
Preambles footnotes page 5	[REP18-027, Ref 124] The ExA is content with drafting and has included in the rDCO.
PART 1: Preliminary	
Article 1 Citation and commencement	

Table 2: Provision for change	Explanation
"201" amended "202"	Date update. The ExA is content with drafting and has included in the rDCO.
Article 2: Interpretation	
"under article 37" added to all references to certified plans	[REP18-027, Ref 125] The ExA is content with drafting and has included in the rDCO.
Deletion of " <i>the 2011 Regulations</i> "	[REP18-027, Ref 125] The ExA is content with drafting and has included in the rDCO.
<i>Addition of definition for "business day"</i>	[REP18-027, Ref 125] plus correction in rDCO from that in dDCO " <i>Saturday of Sunday</i> " to " <i>Saturday or Sunday</i> ". The ExA is content with drafting and has included in the rDCO.
" <i>converter building</i> "	[REP18-027, Ref 38] The ExA is content with drafting and has included in the rDCO.
" <i>gravity base</i> "	[REP18-027, Ref 0] The ExA is content with drafting and has included in the rDCO.
"HAT"	[REP18-027, Ref 39] The ExA is content with drafting and has included in the rDCO.
" <i>highway</i> "	[REP18-027, Ref 201] The ExA is content with drafting and has included in the rDCO.
" <i>highway authority</i> "	[REP18-027, Ref 202] The ExA is content with drafting and has included in the rDCO.
Addition of " <i>Hornsea Project Three Offshore Windfarm Development Consent Order</i> " means...	[REP18-027, Ref 40, Ref 60 and Ref 125] The ExA is content with drafting and has included in the rDCO.
" <i>jacket foundation</i> "	[REP18-027, Ref 0]

Table 2: Provision for change	Explanation
	The ExA is content with drafting and has included in the rDCO.
" <i>main river</i> "	[REP18-027, Ref 41, Ref 199] The ExA is content with drafting and has included in the rDCO.
" <i>monopile foundation</i> " definition deleted	[REP18-027, Ref 125] (definition covered in relevant Interpretations in Schedules 9-13). The ExA is content with drafting and has included in the rDCO.
" <i>Norfolk Vanguard DCO</i> " definition updated	[REP18-027, Ref 125] The ExA is content with drafting and has included in the rDCO.
" <i>onshore cable corridor</i> " definition deleted	[REP18-027, Ref 125] The ExA is content with drafting and has included in the rDCO.
" <i>onshore decommissioning plan</i> "	[REP18-027, Ref 61] The ExA is content with drafting and has included in the rDCO.
" <i>onshore transmission works</i> "	[REP18-027, Ref 22] The ExA is content with drafting and has included in the rDCO.
" <i>owner</i> "	Footnote # update. The ExA is content with drafting and has included in the rDCO.
" <i>relevant drainage authorities</i> "	[REP18-027, Ref 125] The ExA is content with drafting and has included in the rDCO.
" <i>requirements</i> " addition to definition	[REP18-027, Ref 125] The ExA is content with drafting and has included in the rDCO.
" <i>stage</i> "	[REP18-027, Ref 62] The ExA is content with drafting and has included in the rDCO.
" <i>street authority</i> "	Footnote # update.

Table 2: Provision for change	Explanation
	The ExA is content with drafting and has included in the rDCO.
<i>"tetrabase foundation"</i>	[REP18-027, Ref 0] The ExA is content with drafting and has included in the rDCO.
PART 2 Principal Powers	
Article 7: Application and modification of legislative provisions	
Article 7(1), 7(2) and 7(3)(b) and (c)	Footnote updates. The ExA is content with drafting and has included in the rDCO.
Article 7(3)(a)	[REP18-027, Ref 44, Ref 200] and footnote updates. The ExA is content with drafting and has included in the rDCO.
Article 8: Defence to proceedings in respect of statutory nuisance	[REP18-027, Ref 127] and [REP18-027, Ref 128] and footnote updates. The ExA is content with drafting and has included in the rDCO.
Articles 7 and 8	Footnote updates [REP18-027, Ref 129] The ExA is content with drafting and has included in the rDCO.
PART 3: Streets	
Article 9(3): Street works	[REP18-027, Ref 130] The ExA is content with drafting and has included in the rDCO.
Article 11(9): Stopping up of streets	[REP18-027, Ref 131] The ExA is content with drafting and has included in the rDCO.
Article 14: Application of the 1991 Act	[REP18-027, Ref 132] The ExA is content with drafting and has included in the rDCO.

Table 2: Provision for change	Explanation
PART 4: Supplemental Powers	
Article 17: Removal of human remains	Footnote updates [REP18-027, ref 136] The ExA is content with drafting and has included in the rDCO.
PART 5: powers of acquisition	
Article 19: Time limit for exercise of authority to acquire land compulsorily	[REP18-027, Ref 137] and footnote updates. The ExA is content with drafting and has included in the rDCO.
Article 20: Compulsory acquisition of rights	[REP18-027, Ref 138] The ExA is content with drafting and has included in the rDCO.
Article 21: Private rights	[REP18-027, Ref 139] The ExA is content with drafting and has included in the rDCO.
Article 22: Application of the Compulsory Purchase (Vesting Declarations) Act 1981	[REP18-027, Ref 140] and footnotes [REP18-027, Ref 141] The ExA is content with drafting and has included in the rDCO.
Article 23: Application of Part 1 of the Compulsory Purchase Act 1965	[REP18-027, Ref 142] and [REP18-027, Ref 143] The ExA is content with drafting and has included in the rDCO.
Article 25: Rights under or over Streets	[REP18-027, Ref 144] The ExA is content with drafting and has included in the rDCO.
Article 30: Recovery of costs of new connections	[REP18-027, Ref 151] The ExA is content with drafting and has included in the rDCO.
PART 6: Operations	
Article 32: Deemed marine licence under the 2009 Act	[REP18-027, Ref 152] The ExA is content with drafting and has included in the rDCO.

Table 2: Provision for change	Explanation
PART 7: Miscellaneous and General	
Article 33: Application of landlord and tenant law	[REP18-027, Ref 153] The ExA is content with drafting and has included in the rDCO.
Article 34: Operational land for the purposes of the 1990 Act	[REP18-027, Ref 154] The ExA is content with drafting and has included in the rDCO.
Article 35: Felling or lopping of trees and removal of hedgerows	[REP18-027, ref 155] and footnote #. The ExA is content with drafting and has included in the rDCO.
Article 36: Trees subject to tree preservation orders	[REP18-027, ref 156] The ExA is content with drafting and has included in the rDCO.
Article 39: Procedure in relation to certain approvals etc	Addition of " <i>or any other relevant discharging authority</i> " and addition of R32 [REP18-027, Ref 24] and [REP18-027, Ref 25] The ExA is content with drafting and has included in the rDCO.
Article 40: Abatement of works abandoned or decayed	[REP18-027, ref 158] The ExA is content with drafting and has included in the rDCO.
Article 42: Crown rights	[REP18-027, ref 159]
SCHEDULES	
SCHEDULE 1: Associated Development	[REP18-027, Ref 26] The ExA is content with drafting and has included in the rDCO.
SCHEDULE 1, PART 3, Requirements	
Requirement 9: Detailed offshore design parameters	[REP18-027, Ref 5] The ExA is content with drafting and has included in the rDCO.
Requirement 12: Aviation safety	Footnote#.

Table 2: Provision for change	Explanation
	The ExA is content with drafting and has included in the rDCO.
Requirement 17: Landfall method statement	[REP18-027, Ref 32] and amend NE to "<i>relevant statutory nature conservation body</i>". The ExA is content with drafting and has included in the rDCO.
Requirement 20: Code of construction practice	[REP18-027, Ref 7, Ref 34] The ExA is content with drafting and has included in the rDCO.
Requirement 23: Archaeological written scheme of investigation	[REP18-027, Ref 35] The ExA is content with drafting and has included in the rDCO.
Requirement 25: Water course crossings	[REP18-027, Ref 72, Ref 10] The ExA is content with drafting and has included in the rDCO.
Requirement 28: European protected species	[REP18-027, Ref 10] The ExA is content with drafting and has included in the rDCO.
Requirement 30: Requirement for written approval	Adds "<i>any other relevant discharging authority</i>" [REP18-027, Ref 73] The ExA is content with drafting and has included in the rDCO.
Requirement 31: Amendment to approved details	Adds "<i>relevant discharging authority</i>" [REP18-027, Ref 74] The ExA is content with drafting and has included in the rDCO.
Requirement 34: Cromer Primary Surveillance Radar	NATS' acronym amended. The ExA is content with drafting and has included in the rDCO.
SCHEDULE 7	
SCHEDULE 7 (2)(1)	Footnote#. The ExA is content with drafting and has included in the rDCO.

Table 2: Provision for change	Explanation
SCHEDULES 9 - 13	GENERATION, TRANSMISSION AND INTERCONNECTOR DMLs
SCHEDULES 9 – 13, PART 1, Interpretation <i>"Cefas", "materials and" "HAT", "statutory nature conservation body"</i>	[REP18-027, Ref 0, Ref 10. Ref 166] and footnote changes, and date of Order. The ExA is content with drafting and has included in the rDCO.
SCHEDULES 9 – 13, PART 2, paras 1, 2, 4	[REP18-027, Ref 167] The ExA is content with drafting and has included in the rDCO.
SCHEDULES 9 & 10, PART 4, Condition 6	[REP18-027, Ref 05] The ExA is content with drafting and has included in the rDCO.
SCHEDULE 11, PART 4, Condition 12	[REP18-027, Ref 20] The ExA is content with drafting and has included in the rDCO.
SCHEDULE 12, PART 4, Condition 1	Minor addition for consistency with Schedule 11. The ExA is content with drafting and has included in the rDCO.
SCHEDULES 9 & 10, PART 4, Condition 22 SCHEDULES 11 & 12, PART 4, Condition 17	[REP18-027, Ref 56]. The ExA is content with drafting and has included in the rDCO.
SCHEDULE 14	
SCHEDULE 14: HEDGEROWS	[REP18-027, Ref 214, Ref 215]. The ExA is content with drafting and has included in the rDCO.
Explanatory Note	
Explanatory Note	[REP18-027, Ref 224]. The ExA is content with drafting and has included in the rDCO.

Table 3: Contentious provisions

- 9.4.7. Table 3 sets out contentious provisions where there was substantive discussion between the Applicant and/or other IPs and the ExA about potential changes to drafting. The detailed reporting of these matters is provided in relevant sections of this Recommendation Report (Chapter 4, Sections within Chapter 5, Chapter 6 and Chapter 8). Table 3 signposts where the detailed reporting is provided. It also captures any minor drafting amendments related to that provision.

Table 3: Contentious provisions where drafting changes were proposed in the dDCO [REP18-009], some of which are included in the rDCO and others are not.

Table 3: Provision	Examination Issue	Location in Recomm'n Report
PART 1 Preliminary		
Contents	The dDCO included square bracketed optional definitions, some of which are also reflected in the Contents pages. To accord with changes below, the ExA has removed the square brackets round the following: PART 7 44. Compensation to protect the coherence of the Natura 200 network. SCHEDULE 19. The ExA includes this change in the rDCO.	Section 5.9 - Marine Biodiversity & Chapter 6 - HRA
Article 2: Interpretation	The dDCO included square bracketed optional definitions for either "<i>outline Norfolk Boreas Haisborough, Hammond and Winterton Special Area of Conservation (HHW SAC) Site Integrity Plan</i>" (SIP) OR "<i>Cable Specification Installation and Monitoring Plan</i>" (CSIMP). [REP18-027, Ref 83]. The ExA includes the CSIMP in the rDCO.	Section 5.9 - Marine Biodiversity & Chapter 6 - HRA

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	(This relates also to Schedules 11&12 Part 1, para 1(1)).	
<i>"noise sensitive location"</i>	Discussions regarding the difference between noise sensitive location and noise sensitive receptors. Some corresponding changes to OCoCP to explain the differences. [REP18-019, Section 9.1], [REP18-027, Ref 42]. The ExA is content with the drafting definition and includes in the rDCO.	Section 5.5 – Noise and Vibration
PART 2 Principal Powers		
Article 6: Benefit of the Order	Various amendments to arrangements for transfer and SoS role, plus a deletion to (11)(a) to enable any licence holder under Section 6 of the 1989 Electricity Act to make a transfer without the SoS's consent. [REP18-027, Ref 126] Typographical corrections. [REP18-027, Ref 1, Ref 2, Ref 23, Ref 43]. The ExA is content with drafting and includes in the rDCO.	Section 9.5 – Draft DCO and related matters
PART 4: Supplemental Powers		
Article 15: Discharge of water and works to water courses	Amendment in response to the EA's requested wording change on requirement for environmental permit for discharge to controlled waters [REP18-027, Ref 45]. Also agreed wording change to 15(1) and footnote updates. [REP18-027, Ref 133, Ref 134]. The ExA is content with drafting and includes in the rDCO	Section 5.7 – Water and Flood Risk

Table 3: Provision	Examination Issue	Location in Recomm'n Report
Article 16(1): Authority to survey and investigate the land onshore	Sustained disagreement between Applicant and the NFU over whether "<i>trial hole</i>" in 16(1) would include boreholes. The dDCO wording is retained without inclusion of "<i>and boreholes</i>". The ExA is content with drafting and includes in the rDCO.	Section 5.8 – Socio Economic
Article 16(2): Authority to survey and investigate the land onshore	dDCO amendment from "<i>landowner and occupier</i>" to "<i>landowner or occupier</i>" is not accepted by the ExA. [REP18-027, Ref 135]. The ExA has reverted back to the previous drafting "<i>landowner and occupier</i>" and includes in the rDCO.	Section 9.5 – Draft DCO and related matters
Article 16(3) (NEW): Authority to survey and investigate the land onshore	Sustained disagreement between Applicant and the NFU over information that should be required in the notice in 16(2). The ExA recommends a new subclause 16(3) in the rDCO to address the NFU's points, based on the NFU's drafting. This also amends subclause numbering thereafter: 16(3) to 16(8) become 16(4) to 16(9).	Section 5.8 – Socio economic
PART 5: Powers of Acquisition		
Article 24: Acquisition of subsoil or airspace only	ExA initial concerns over the scope of this power allayed by Applicant's responses. The ExA is content with drafting and has included this in the rDCO.	Chapter 8 Compulsory Acquisition
Article 26: Temporary use of land for carrying out the authorised project	A number of minor amendments included 26(1)(a) [REP18-027, Ref 145], 26(1)(e) [REP18-027, Ref 146], 26(3) [REP18-027, ref 147], 26(6) [REP18-027, Ref	N/A – minor drafting amendments only

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	148], 26(10) [REP18-027, Ref 149]. The ExA is content with drafting and includes in the rDCO.	
Article 26(2): Temporary use of land for carrying out the authorised project	26(2) Sustained disagreement between the Applicant and the NFU over timing of notice before entering land to take temporary possession. Applicant proposes 14 days; NFU proposes 28 days. The ExA prefers 28 days and includes in the rDCO.	Section 5.8 – Socio economic
Article 27: Temporary use of land for maintaining authorised project	Reflects agreed position with NNDC to secure temporary rights for maintenance of trees, hedges and shrubs for a period of ten years in North Norfolk District. [REP18-027, Ref 84]. Other minor amendments. [REP18-027, Ref 150]. The ExA is content with drafting and includes in the rDCO.	Section 5.3 – Landscape and visual effects
PART 7: Miscellaneous and General		
Article 37: Certification of Plans	Moving and re-ordering the list of documents for certification from this article into Schedule 18: Documents to be Certified and to provide a mechanism to secure versions of each control document and ES document. [REP18-027, Ref 63]. The ExA is content with drafting and includes in the rDCO.	Section 9.5 – Draft DCO and related matters
Article 38: Arbitration	Removal of the 14 day time limit for the appointment of an arbitrator by the SoS at 38(3) [REP18-027, Ref 157]. The ExA is content with drafting and includes in the rDCO.	Section 9.5 – Draft DCO and related matters

Table 3: Provision	Examination Issue	Location in Recomm'n Report
Article 44: Compensation to protect the coherence of the Natura 2000 network	The dDCO includes the option in square brackets to include reference to Schedule 19, which would provide for compensation. [REP18-027, Ref 85]. The ExA has removed the square brackets in order to secure compensation via Schedule 19 and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 – HRA
SCHEDULES		
SCHEDULE 1: Authorised Project		
SCHEDULE 1, PART 1, Work No. 1	Reduction in maximum number of turbines [REP18-027, Ref 64]. The ExA is content with the reduction in the number of turbines and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 – HRA
SCHEDULE 1, PART 1, Work No. 10A	Discussion regarding whether further definition required in relation to detail design of the National Grid substation. The ExA does not propose any additions to the dDCO drafting. No changes included in the rDCO.	Section 5.3 – Landscape and visual effects
SCHEDULE 1, PART 1, Further Associated Development	Additional title [REP18-027, Ref 27], removal of wording including "<i>necessary or expedient</i>" [REP18-027, Ref 28] and amend "<i>cubic metres</i>" to "<i>m³</i>". The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only

Table 3: Provision	Examination Issue	Location in Recomm'n Report
SCHEDULE 1, PART 1, Further Associated Development (c)	Revised removal and disposal volumes of seabed material because of amended project envelope. [REP18-027, Ref 65]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULE 1, PART 3 Requirements		
Requirement 2(1)(d): Detailed offshore design parameters	Updating of turbine spacing to reflect increase in minimum turbine size. [REP18-027, Ref 66] (superseding [REP18-027, Ref 3]). Equivalent change made to Schedules 9 and 10, Condition 1(1)(d). The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
Requirement 2(e): Detailed offshore design parameters	Increase in minimum draught height above MHWS of turbine blade tip as further mitigation. [REP18-027, Ref 67]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
Requirement 3(1): Detailed offshore design parameters	Reduction in maximum number of turbines. [REP18-027, Ref 64]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
Requirement 5(2): Detailed offshore design parameters	Reduction in volume of cable protection in HHW SAC. [REP18-027, Ref 160] (superseding [REP18-027, Ref 4, Ref 68, Ref 103]). The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
Requirement 5(3): Detailed offshore design parameters	Reduction in area occupied by cable protection in HHW SAC. [REP18-027, Ref 160]	Section 5.9 – Marine

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	(superseding [REP18-027, Ref 4, Ref 68, Ref 103]). The ExA is content with drafting and includes in the rDCO.	biodiversity & Chapter 6 - HRA
Requirement 5(4): Detailed offshore design parameters	Reflecting further commitment to reduce cable protection in Work No. 1 (e and f) and Work No. 4A and 4B. [REP18-027, Ref 161] (superseding [REP18-027, Ref 46, Ref 68, Ref 103, Ref 104]). Equivalent changes made in the DMLs. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
Requirement 11: Detailed offshore design parameters	Amended scour protection area and volume which must not be exceeded and reference to the Outline Scour Protection and Cable Protection Plan. [REP18-027, Ref 47, Ref 69]. Equivalent changes have been made in the DMLs. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
Requirement 14: Offshore decommissioning	Addition of three clauses to R14 using 'without prejudice' wording in SoCG agreed with the MMO [REP16-009] to secure decommissioning of cable protection in the HHW SAC. It was agreed to leave the SoS to decide whether reliance on Condition 3(1)(g) of Schedules 11 & 12 was sufficient, and if not, whether Condition 20 or additions to R14 were the most appropriate mechanism. [REP18-027, Ref 212]. The ExA has included the wording at R14 and has not included any Condition 20 in Schedules 11 & 12 Part 4 of the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA

Table 3: Provision	Examination Issue	Location in Recomm'n Report
Requirement 15(2), (6): Scenarios, stages and phases of authorised development onshore	Amended to cross-refer to the definition of 'commenced' in the Norfolk Vanguard OWF made Order. [REP18-027, Ref 162]. Title of R15 amended [REP18-027, Ref 29]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
Requirement 15(3), (4): Scenarios, stages and phases of authorised development onshore	Added ability to amend written scheme setting out work stages. [REP18-027, Ref 86]. The ExA is content with drafting and includes in the rDCO.	Section 5.3 – Landscape and visual effects
Requirement 16 (1), (2), (3), (5), (6), (10) (12)(b): Detailed design parameters onshore	Rewording to clarify types of substation buildings including " <i>converter buildings</i> ", linked to definition in Article 2. [REP18-027, Ref 48]. Amendments to clarify construction must be in accordance with details approved by relevant planning authority. [REP18-027, Ref 30]. The ExA is content with drafting and includes in the rDCO.	Section 5.3 – Landscape and visual effects
Requirement 16 (13)(s): Detailed design parameters onshore	Additional trenchless crossing on A1067. [REP18-027, Ref 6]. The ExA is content with drafting and has included in the rDCO.	Section 5.4 – Onshore construction effects
Requirement 16 (13)(t): Detailed design parameters onshore	Additional trenchless crossing on B1149. [REP18-027, Ref 163]. Related addition of plot 19/05 to Schedule 6 for Scenarios 1 and 2 and Schedule 8 for Scenario 2 and addition to Land Plan. [REP18-027, Ref 165]. The ExA has deleted the reference to the Hornsea Project Three OWF DCO at 16(13)(t) and included the B1149 (Work	Section 5.4 – Onshore construction effects

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	No. 6), as a location for the use of trenchless installation techniques.	
Requirement 16 (15): Detailed design parameters onshore	Clarification of maximum areas for temporary compounds. [REP18-027, Ref 31]. The ExA is content with drafting and includes in the rDCO.	Section 5.4 - – Onshore construction effects
Requirement 18 (2)(j), (k): Provision of landscaping	Additional subclauses for reference to integration of sustainable drainage measures and guidance on materials and colours for project substation. [REP18-027, Ref 33]. The ExA is content with drafting and includes in the rDCO.	Section 5.3 – Landscape and visual effects
Requirement 19 (2), (3) Implementation and maintenance of landscaping	Reflects agreed position with NNDC for maintenance of trees, hedges and shrubs for ten years in North Norfolk District and five years elsewhere. Change from "agreed" to "approved by". [REP18-027, Ref 70, Ref 87]. The ExA is content with drafting and includes in the rDCO.	Section 5.3 - – Landscape and visual effects
Requirement 21(4): Traffic	Additions to reflect that the Traffic Management Plan must include the final detailed scheme for Link 34 with reference to Hornsea Project Three OWF DCO if made. [REP18-027, Ref 71, Ref 88, Ref 164] (supersedes [REP18-027, Ref 49]). The ExA is content with drafting and includes in the rDCO.	Section 5.2- Traffic and transport
Requirement 24 (4): Ecological Management Plan	Reflects wording agreed with NE, signposting mitigation measures in the Broadland SPA. [REP18-027, Ref 8].	Chapter 6 - HRA

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	Minor amendments to R24(1), (3) [REP18-027, Ref 36] and amend NE to "<i>relevant statutory nature conservation body</i>". The ExA is content with drafting and includes in the rDCO.	
Requirement 26 (4), (5): Construction hours	Addition to details and types of activities, such as crushing and screening, to be agreed with relevant planning authority. [REP18-027, Ref 9, Ref 50]. The ExA is content with drafting and includes in the rDCO.	Section 5.4 – Onshore construction effects
Requirement 27: Control of noise during operational phase and during maintenance	Additions to refer to maintenance and details of noise emissions. [REP18-027, Ref 51]. The ExA is content with drafting and includes in the rDCO.	Section 5.5 – Noise and vibration
Requirement 36: Base port(s) travel plans	The ExA has added a new requirement in relation to travel plans at base port(s) in the rDCO. This is based on drafting suggested by NCC, as amended by the Applicant. The ExA is content with drafting and includes in the rDCO.	Section 5.2- Traffic and transport
SCHEDULE 5: Access to Works, PARTS 1 and 2		
SCHEDULE 5: Access to Works, PARTS 1 and 2	A number of access points were queried by affected persons. The ExA accepts the Applicant's justification for their retention. The ExA is content with drafting and includes in the rDCO.	Section 5.8 – Socio economic & Chapter 8 – Compulsory Acquisition

Table 3: Provision	Examination Issue	Location in Recomm'n Report
SCHEDULE 6		
SCHEDULE 6, PART 1, Scenario 1	"Full cable rights". Additional plot number (1no.) added to reflect updates to the Land Plans in relation to a previous title now split into two titles. [REP18-027, Ref 203]. The ExA is content with drafting and has included in the rDCO.	Chapter 8 - Compulsory Acquisition
SCHEDULE 6, PART 1, Scenario 1	"Minor crossings inc. highway to be undertaken by trenchless crossing". Additional plot for B1149 crossing. Included in Scenario 1 for maintenance purposes. The ExA is content with drafting and has included in the rDCO.	Section 5.4 - Onshore construction effects
SCHEDULE 6, PART 2, Scenario 2	"Full cable rights." Additional plot numbers (3no.) added to reflect updates to the Land Plans in relation to a previous title now split into two titles. [REP18-027, Ref 105]. The ExA is content with drafting and has included in the rDCO.	Chapter 8 - Compulsory Acquisition
SCHEDULE 6, PART 2, Scenario 2	"Minor crossings inc. highway". Remove plot for B1149 minor crossing because crossing would be by trenchless crossing. The ExA has deleted the plot from the rDCO.	Section 5.4 - Onshore construction effects
SCHEDULE 6, PART 2, Scenario 2	"Minor crossings inc. highway to be undertaken by trenchless crossing". Additional plot for B1149 trenchless crossing. [REP18-027, Ref 165]. The ExA is content with drafting and has included in the rDCO.	Section 5.4 - Onshore construction effects & Chapter 8 - Compulsory Acquisition
SCHEDULE 8		

Table 3: Provision	Examination Issue	Location in Recomm'n Report
SCHEDULE 8, PART 1, Scenario 1	Amended Scenario 2 to Scenario 1. [REP18-027, Ref 204]. The ExA is content with drafting and has included in the rDCO.	N/A - minor drafting amendment only
SCHEDULE 8, PART 1, Scenario 1	Added plot number (1 no.) to reflect updates to the Land Plans to reflect an ownership split. [REP18-027, Ref 203]. The ExA is content with drafting and has included in the rDCO.	Chapter 8 – Compulsory Acquisition
SCHEDULE 8, PART 1, Scenario 1	Added plot numbers (7no.) to reflect updates to the Land Plans in relation to a previous title now split into two titles. [REP18-027, Ref 106] Amendment to Work No. 11A(E). The ExA is content with drafting and has included in the rDCO.	Chapter 8 – Compulsory Acquisition
SCHEDULE 8, PART 2, Scenario 2	Addition of plot relating to trenchless crossing zone for passing under B1149. The ExA includes this addition in the rDCO.	Section 5.4 – Onshore construction effects
SCHEDULE 8, PART 2, Scenario 2	Additional plot numbers (3no.) added to reflect updates to the Land Plans in relation to a previous title now split into two titles [REP18-027, Ref 107]. Amendment to Work No. 11A(E). The ExA is content with drafting and has included in the rDCO.	Chapter 8– Compulsory Acquisition
SCHEDULE 8, PART 2, Scenario 2	Additional plot numbers (4no.) added to reflect updates to the Land Plans in relation to a previous title now split into two titles [REP18-027, Ref 108].	Chapter 8– Compulsory Acquisition

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	The ExA is content with drafting and has included in the rDCO.	
SCHEDULES 9- 13	GENERATION, TRANSMISSION AND INTERCONNECTOR DMLs	
SCHEDULES 9 & 10, PART 3, para 1(1)(d), 1(d)(ii) and 2(2)(c) and Part 4 Condition 8(1)(h)	Updated quantities of disposal of inert material to reflect amended project envelope with smaller number of larger WTGs. [REP18-027, Ref 11, Ref 75]. The ExA is content with drafting and has included in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULES 9 & 10, PART 3, para 1	Minor amendments to add " <i>licensable marine activities</i> ". [REP18-027, Ref 168]. The ExA is content with drafting and has included in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 9 & 10, PART 3, para 1(d)	Updated disposal site reference [REP18-027, Ref 89]. Updated disposal quantities for turbines. [REP18-027, Ref 76]. The ExA is content with drafting and has included in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 9 & 10, PART 3, para 2(1)(a)	Reduction in maximum number of turbines. [REP18-027, Ref 64]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity Chapter 6 - HRA
SCHEDULES 9 & 10, PART 4, Condition 1(1)(d) Design Parameters	Updating of turbine spacing. [REP18-027, Ref 66] (superseding [REP18-027, Ref 3]). The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity Chapter 6 - HRA
SCHEDULES 9 & 10, PART 4, Condition 1(1)(e) Design Parameters	Increase to minimum draught height above MHWS of turbine blade tip as further mitigation. [REP18-027, Ref 67].	Section 5.9 – Marine biodiversity &

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	The ExA is content with drafting and includes in the rDCO.	Chapter 6 - HRA
SCHEDULES 9 & 10, PART 4, Condition 3	Reflecting further commitment to reduce cable protection in Work No. 1. (e and f). [REP18-027, Ref 161] (superseding [REP18-027, Ref 68]). Equivalent changes made in R5. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULES 9 & 10, PART 4, Condition 8(1)(b)	Reduction in maximum number of turbines. [REP18-027, Ref 64]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity Chapter 6 - HRA
SCHEDULES 9 & 10, PART 4, Condition 8(1)(g)	Amended maximum quantities of scour protection. [REP18-027, Ref 77]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULES 9 & 10, PART 4, Condition 8(1)(h)	Amended maximum quantities of disposal of inert material. [REP18-027, Ref 75]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULES 9 & 10, PART 4, Condition 9(1)(ii)	Minor amendment. [REP18-027, Ref 169]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULE 9, PART 4, Condition 9(9), SCHEDULE 10, PART 4, Condition 9(8), SCHEDULES 11 & 12 PART 4, Condition 4(8), and SCHEDULE 13 Condition 3(8)	Addition of "MCA" for receipt of notifications. [REP18-027, Ref 12, Ref 13]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only

Table 3: Provision	Examination Issue	Location in Recomm'n Report
SCHEDULES 9 & 10 PART 4, Condition 9(10), SCHEDULES 11 & 12 PART 4, Condition 4(10), and SCHEDULE 13 PART 4, Condition 3(10)	Amendment to notification ten days prior to commencement. [REP18-027, Ref 109]. The ExA is content with drafting and includes in the rDCO.	Section 5.17 – Navigation and Shipping
SCHEDULES 9 & 10 PART 4, Condition 9(12) SCHEDULES 11 & 12 PART 4, Condition 4(12) SCHEDULE 13 PART 4, Condition 3(12)	Amendment from 5 to 3 days for notifying mariners and informing Kingfisher Information Service of potential cable exposure. [REP18-027, Ref 78, superseding Ref 52]. The ExA is content with drafting and includes in the rDCO.	Section 5.17 - Navigation and Shipping
SCHEDULES 9 & 10 PART 4, Condition 12(4), (5) SCHEDULES 11 & 12 PART 4, Condition 7(4), (5), (10) SCHEDULE 13 PART 4, Condition 5(4), (5)	Addition to information to be provided to the MMO on materials disposed and addition of disposal site references. [REP18-027, Ref 14, Ref 90, Ref 95, Ref 99]. Footnote update [REP18-027, Ref 170] and typographical correction 7(10). [REP18-027, Ref 208]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 9 & 10 PART 4, Condition 14(1)(a)(ix)	Minor addition of ref to annexes to MGN 543. [REP18-027, Ref 15]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 9 & 10 PART 4, Condition 14(1)(b) and Condition 15(3), SCHEDULES 11 & 12 PART 4, Condition 9(1)(b) and Condition 10(3),	These conditions retain 4 months period for approval of post-consent documents. Those agreed for six months are set out below: HHW SAC CSIMP (Schedule 9 & 10 Condition 9(1)(m)), SNS SAC SIP (Schedule 11 & 12 Condition 14(1)(m)) and MMMP (Schedule 11 & 12 Condition 14(1)(f)).	Section 5.9 – Marine biodiversity & Chapter 6 – HRA

Table 3: Provision	Examination Issue	Location in Recomm'n Report
and SCHEDULE 13 PART 4, Condition 7(1)(b) and Condition 8(3)	The ExA is content with drafting and includes in the rDCO.	
SCHEDULES 9 & 10 PART 4, Condition 14(1)(d)(vi)	Amended wording replacement of 'adopted' with the word 'followed' so that it reads " <i>procedures to be followed</i> " requested by NE. [REP18-027, Ref 79]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 9 & 10 PART 4, Condition 14(1)(h) SCHEDULES 11 & 12 PART 4, Condition 9(1)(h) SCHEDULE 13 PART 4, Condition 7(1)(h)	Amendment for WSI to cover Order limits seaward of mean high water. [REP18-027, Ref 53]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 9 & 10 PART 4, Condition 14(1)(g)(ii), SCHEDULES 11 & 12, PART 4, Condition 9(1)(g)(ii), and SCHEDULE 13, PART 4, Condition 7(1)(f)(ii)	Sustained disagreement over additional wording requested by TH to secure steps to be taken to ensure safe navigation if any cable protection is identified exceeding 5% of navigable depth. The ExA prefers the TH drafting. The ExA includes this change in the rDCO.	Section 5.17 – Navigation and Shipping & also referenced in Section 5.11- Fishing and Fisheries
SCHEDULES 9 & 10 PART 4, Condition 14(1)(f) SCHEDULES 11 & 12 PART 4, Condition 9(1)(f)	Addition of wording " <i>...at least six months prior to commencement of licensed activities...</i> " for submission of a marine mammal mitigation protocol. [REP18-027, Ref 205]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity
SCHEDULES 9 & 10 PART 4, Condition	Wording update to clarify the timing for submission and detail	Section 5.9 – Marine

Table 3: Provision	Examination Issue	Location in Recomm'n Report
14(1)(l) SCHEDULES 11 & 12 PART 4, Condition 9(1)(l)	contained in an ornithological monitoring plan. [REP18-027, Ref 80, Ref 91]. The ExA is content with drafting and includes in the rDCO.	biodiversity & Chapter 6 - HRA
SCHEDULES 9 & 10 PART 4, Condition 14(1)(m) SCHEDULES 11 & 12 PART 4, Condition 9(1)(m)	Rewording regarding the submission of a Site Integrity Plan at least 6 months prior to commencement. [REP18-027, Ref 171, Ref 206]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULES 9 & 10 PART 4, Condition 14(3) SCHEDULES 11 & 12 PART 4, Condition 9(3)	Clarification of maximum hammer energy limits. [REP18-027, Ref 54]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULES 9 & 10 PART 4, Condition 15(4), (5), (6) SCHEDULES 11 & 12 PART 4, Condition 10(4), (5), (6) SCHEDULE 13 PART 4, Condition 8(4), (5), (6)	Removal of reference to appeal procedure and renumbering. [REP18-027, Ref 172, Ref 178, Ref 180]. Note: also links to removal of Part 5 of the DMLs. [REP18-027, Ref 173]. The ExA is content with drafting and includes in the rDCO.	Section 9.5 – Draft DCO and related matters
SCHEDULES 9 & 10 PART 4, Condition 15(7), SCHEDULES 11 & 12 PART 4, Condition 10(7), (N.B. previously 15(8) and 10(8) respectively) and SCHEDULE 13 PART 4, Condition 8 (7)	Revised wording regarding confirmation in writing from the MMO in consultation with the MCA that guidance on UK Navigational Practice, Safety and Emergency Issues has been adequately addressed. Also added to Schedule 13. [REP18-027, Ref 17, Ref 213] (superseding [REP18-027, Ref 92, Ref 110]). The ExA is content with drafting and includes in the rDCO.	Section 5.17 – Navigation and Shipping

Table 3: Provision	Examination Issue	Location in Recomm'n Report
SCHEDULES 9 & 10 PART 4, Condition 15(6), NB previously 15(7).	Amendment to address an inconsistency with other DMLs. [REP18-027, Ref 16]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 9 & 10 PART 4, Condition 16, SCHEDULES 11 & 12 PART 4, Condition 11 and SCHEDULE 13 PART 4, Condition 9	Addition of the MMO to those to receive bathymetric survey data. [REP18-027, Ref 18]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 9 & 10 PART 4, Condition 18(2); SCHEDULES 11 & 12 PART 4, Conditions 13(2)	Updated wording on pre-construction surveys and additional subclause on marine mammal monitoring. [REP18-027, Ref 111, Ref 115]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 HRA
SCHEDULES 9 & 10 PART 4, Condition 20(2); SCHEDULES 11 & 12 PART 4, Condition 15(2)	Updated wording on post-construction surveys and additional subclause on marine mammal monitoring. [REP18-027, Ref 55, Ref 112, Ref 116]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 HRA
SCHEDULE 10 PART 4 Condition 20(4)	Correction of typographical error. [REP18-027, Ref 19]. The ExA includes change in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 9 to 13 PART 5	Procedure for appeals deleted [REP18-027, Ref 173] (supersedes minor amendment [REP18-027, Ref 57]). (Linked to changes to Schedule 15: Arbitration Rules). The ExA is content with drafting and includes in the rDCO.	Section 9.5 – Draft DCO and related matters

Table 3: Provision	Examination Issue	Location in Recomm'n Report
SCHEDULES 11, 12 & 13	TRANSMISSION AND INTERCONNECTOR DMLs	
SCHEDULES 11 & 12, PART 1, para 1(1)	dDCO included square bracketed optional definitions for either outline HHW SAC SIP or outline CSIMP. [REP18-027, Ref 83]. (See also Part 1, Article 2, Interpretation.) The ExA has included the outline CSIMP definition in the rDCO. The ExA has corrected the spelling of Haisborough in Schedule 11 in the rDCO. The ExA includes changes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULES 11 & 12, PART 1	Typographical corrections and amendment of list to alphabetical order. [REP18-027, Ref 39, Ref 58]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 11, 12 & 13, PART 3, para 1(d)	Updating of disposal site [REP18-027, Ref 93, Ref 98] and minor amendment to add "<i>licensable marine activities</i>". [REP18-027, Ref 168]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 11, 12 PART 4, Condition 2 N.B. wrongly referenced as Condition 1(2) in [REP18-027, Ref 174]	Change to maximum volume of cable protection in Work Nos. 4A and 4B. [REP18-027, Ref 174]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA

Table 3: Provision	Examination Issue	Location in Recomm'n Report
SCHEDULES 11, 12 & 13 PART 4, Condition 2	Additional reference to outline scour protection and cable protection plan. [REP18-027, Ref 161] (superseding [REP18-027, Ref 47, Ref 69]). Equivalent changes made in R5. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULES 11 & 12, PART 4, Condition 3(1)(b)	Changed wording as agreed with the MMO on distributed quantities of scour protection Cross referenced to Outline Scour Protection and Cable Protection Plan Table 1. [REP18-027, Ref 94]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULES 11 & 12, PART 4, Condition 3(1)(f)	Reduction of total area of cable protection in HHW SAC. [REP18-027, Ref 175] (supersedes [REP18-027, Ref 113]). The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA
SCHEDULES 11 & 12, PART 4, Condition 3(1)(g)	Additional wording agreed with the MMO and NE regarding cable protection in HHW SAC which must not take the form of rock or gravel dumping except at crossings. [REP18-027, Ref 207] (supersedes [REP18-027, Ref 114, Ref 176]). The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 - HRA 6
SCHEDULES 11 & 12 PART 4, Condition 9(1)(g)	Securing a cable specification installation and monitoring plan for cables outside the HHW SAC, and removal of parenthesis for HHW SAC. [REP18-027, 209], (supersedes [REP18-027, Ref 96]).	Section 5.9 – Marine biodiversity & Chapter 6 - HRA

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	The ExA is content with drafting and includes in the rDCO.	
SCHEDULES 11 & 12 PART 4, Condition 9(1)(m)	Drafting changes for HHW SAC SIP. Square bracket option for a SIP or a CSIMP for cable protection within the HHW SAC. [REP18-027, Ref 210, Ref 211] superseding [REP18-027, Ref 97, Ref 177]. The ExA has included changes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 – HRA
SCHEDULES 11 & 12 PART 4, Condition 19	Additional condition which adds seasonal restriction on cable installation works. [REP18-027, Ref 21]. The ExA is content with drafting and includes in the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 – HRA
SCHEDULES 11 & 12 PART 4, Condition 20	Condition 20 is not included, and reliance is put on Condition 3(1)(g) of Schedules 11 & 12 to secure decommissioning of cable protection in HHWSAC as per SoCG with the MMO [REP16-009], with the addition of three clauses to Requirement 14. [REP18-027, Ref 212] superseding [REP18-027, Ref 179]. The ExA has not included Condition 20 in Schedules 11 & 12 Part 4 of the rDCO.	Section 5.9 – Marine biodiversity & Chapter 6 – HRA
SCHEDULE 15		
SCHEDULE 15 Arbitration Rules	Inclusion of new subclause 1(2), regarding use of reasonable endeavours to settle disputes amicably, and associated minor rewording and renumbering. [REP18-027, Ref 181, Ref 182, Ref 183, Ref 184, Ref 185].	Section 9.5 – Draft DCO and related matters

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	(Linked to removal of appeals procedure at Schedules 9 – 13, Part 5. [REP18-027, Ref 173]). The ExA includes change in the rDCO.	
SCHEDULE 16		
SCHEDULE 16: Procedure for Discharge of Requirements, para 1(1)	Amendment to list of Requirements. [REP18-027, Ref 37]. The ExA is content with drafting and includes in the rDCO.	N/A - minor drafting amendments only
SCHEDULE 16: Procedure for Discharge of Requirements, para 3(2)(c)	Amendment from 20 to 28 days allowing a longer time period for appointment of person to hear an appeal regarding discharge of Requirements. [REP18-027, Ref 186]. The ExA is content with drafting and has included in the rDCO.	Section 9.4 – Draft DCO and related matters
SCHEDULE 16: Procedure for Discharge of Requirements, para 4	Amendment to list of Requirements. [REP18-027, Ref 25]. The ExA has added Requirement 36 in 1(1) to the list of requirements to which this Schedule applies. The ExA includes change in the rDCO.	N/A - minor drafting amendments only
SCHEDULE 17		
SCHEDULE 17, PART 1 (electricity, gas, water and sewerage undertakers)	Minor amendments agreed between parties [REP18-027, Ref 187]. The ExA is content with drafting and includes in the rDCO.	Chapter 8 – Compulsory Acquisition
SCHEDULE 17, PART 2 (National Grid)	Amendments and additions agreed between parties. [REP18-027, Ref 117, Ref 188].	Chapter 8 – Compulsory Acquisition

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	The ExA is content with drafting and includes in the rDCO.	
SCHEDULE 17, PART 3 (Cadent Gas Limited)	Amendments and additions agreed between parties. [REP18-027, Ref 118, Ref 189]. The ExA is content with drafting and includes in the rDCO.	Chapter 8 – Compulsory Acquisition
SCHEDULE 17, PART 4 (Operators of Electronic Communications Code Networks)	Minor amendments agreed between parties. [REP18-027, Ref 119, Ref 190]. The ExA is content with drafting and includes in the rDCO.	Chapter 8 – Compulsory Acquisition
SCHEDULE 17, PART 5 (Network Rail Infrastructure Limited)	Amendments and additions agreed between parties. [REP18-027, Ref 191, Ref 192]. The ExA has corrected " <i>Schedule 14</i> " to " <i>Schedule 15</i> " in para 69 of Schedule 17 of the rDCO. The ExA includes this change in the rDCO.	Chapter 8 – Compulsory Acquisition
SCHEDULE 17, PART 6 (Anglian Water Services Limited)	Minor amendments agreed between parties. [REP18-027, Ref 193, Ref 194]. The ExA is content with drafting and includes in the rDCO.	Chapter 8 – Compulsory Acquisition
SCHEDULE 17, PART 7 (The Environment Agency and drainage authorities)	Amendments and additions agreed between parties including addition of word " <i>relevant</i> " before " <i>drainage authority</i> " to encompass the drainage authority relevant to the type of watercourse; and of the words " <i>...total volume or...</i> " agreed with the WMA; and removal of deemed approval [REP18-027, Ref 41, Ref 59, Ref 100, Ref 195, Ref 196, Ref 216, Ref 217, Ref 218]. (Also, minor change [REP18-027, Ref 81])	Section 5.7 Water etc Chapter 8 – Compulsory Acquisition

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	which wrongly references Schedule 16 instead of 17). The ExA is content with drafting and includes in the rDCO.	
SCHEDULE 17, PART 8 (Ørsted Hornsea Project Three (UK) Ltd)	Minor amendments agreed between parties. [REP18-027, Ref 197]. The ExA has corrected "<i>article 39 (arbitration)</i>" to "<i>article 38 (arbitration)</i>" in Schedule 17 para 97 of the rDCO. The ExA includes this change in the rDCO.	Chapter 8 – Compulsory Acquisition
SCHEDULE 17, PART 9 (Norfolk Vanguard Limited)	Amendments and additions agreed between parties. [REP18-027, Ref 119, Ref 190]. The ExA is content with drafting and includes in the rDCO.	Chapter 8 – Compulsory Acquisition
SCHEDULE 18		
SCHEDULE 18: Documents to be Certified	New schedule with subsequent updates listing "<i>Documents to be Certified</i>", in two parts, previously listed within Article 37. [REP18-027, Ref 82, Ref 101, Ref 120, Ref 198, Ref 219] The ExA has included final Examination Library references within this schedule. The ExA includes this change in the rDCO.	Section 9.5 – Draft DCO and related matters
SCHEDULE 19		
SCHEDULE 19: Compensation to protect the coherence of the Natura 2000 Network	Square brackets option regarding inclusion (or not) for compensation for Flamborough and Filey Coast SPA (kittiwake loss compensation), Alde-Ore Estuary SPA (improve breeding success for lesser black-backed gull) and HHW SAC (extension).	Section 5.9 – Marine biodiversity & Chapter 6 - HRA

Table 3: Provision	Examination Issue	Location in Recomm'n Report
	[REP18-027, Ref 102, Ref 220, Ref 221, Ref 222, Ref 223]. The ExA has removed the square brackets from the rDCO, providing for compensation. The ExA includes this change in the rDCO.	

9.5. OTHER rDCO MATTERS

Article 6: Benefit of the Order

- 9.5.1. The Applicant has made a number of amendments to carry across relevant changes from the Norfolk Vanguard OWF Order with an additional deletion to Article 6(11(a)) to enable any licence holder under Section 6 of the Electricity 1989 Act to make a transfer without the SoS's consent [REP13-016, Item 4a)]. The Applicant explains that these have been agreed with National Grid [REP18-027, Ref 126].
- 9.5.2. The ExA is content that these changes are appropriate and includes them in the rDCO.

Article 16(2): Authority to survey and investigate the land onshore

- 9.5.3. The Applicant amended the wording in Article 16(2) regarding notice to be served from "*served on every owner and occupier*" to "*served on every owner or occupier*". The reason in the Schedule of Reasons is stated as being for consistency with that for the made Norfolk Vanguard OWF Order [REP18-027, ref 135]. The ExA disagrees with this change because it considers that a landowner should be as entitled to receive the notice to investigate or survey as an occupier; and vice versa.
- 9.5.4. The ExA has therefore changed the wording back to "*served on every owner and occupier*" in its rDCO. The ExA does not consider that this inconsistency with the Order of the Norfolk Vanguard OWF would be a burden to those serving the notices, especially as that circumstance would only arise in Scenario 1.

Article 37: Certification of documents and Schedule 18

- 9.5.5. The ES is one of several documents identified by Article 37 in the dDCO as a document to be submitted for certification that it is a true copy of the document referred to in the DCO by the SoS.

- 9.5.6. The Applicant stated in response to comments by Natural England (NE) that *"the ES is a record of what is assessed and therefore does not require any updates"* [REP4-009, No1.].
- 9.5.7. The ExA explored this further in WQ2, inviting the Applicant to consider an extension of the definition of the ES in Article 2, because of the need to capture in a document which is itself certified the versions of the documents and plans to be certified, for the benefit of future users such as the post-consent discharging authorities. The Applicant agreed that a number of documents submitted to the Examination, for example updated Collision Risk Models, can be considered to form part of the ES [REP5-045, Q2.5.1.1 and Q2.5.1.9].
- 9.5.8. The Applicant consequently updated the Note on Requirements at the end of the Examination to make clear the latest version and also inserted a new Schedule to the dDCO listing certified documents with version references, including those documents considered to form part of the ES [REP18-009, Schedule 18],[REP18-014].
- 9.5.9. The ExA welcomes the changes made and considers these give improved clarity to the versions of the certified documents and it is particularly helpful to have the list of certified documents separately identified in Schedule 18 [REP18-009].

Article 38: Arbitration

- 9.5.10. The revised Article 38 would mean that the parties would either need to agree an arbitrator, or if no agreement was reached, then a party can make an application to the SoS who would appoint an arbitrator themselves. The timeframe of 14 days within which the SoS must appoint an arbitrator was removed by the SoS in the made Order for the Norfolk Vanguard OWF [REP13-016, Item 4c)]. The Applicant carried forward this change for consistency. No other parties provided representations objecting to this change.
- 9.5.11. The ExA accepts the deletion of the 14 day time limit and includes this in the rDCO.

Appeal or arbitration procedures in the DMLs

- 9.5.12. The MMO [RR-069] supported by NE [RR-099] and Trinity House [REP2-040] had major concerns regarding the arbitration and appeals process proposed by the Applicant. They considered that the proposed changes to the Marine Licensing (Licence Application Appeals) Regulations 2011 (Appeal Regulations) would not be an appeal procedure broadly consistent with existing statutory processes. The MMO outlined the mechanism available to the Applicant should the MMO fail to make a determination within what the Applicant considered to be a reasonable timescale, via Judicial Review.
- 9.5.13. Detailed negotiations with the MMO and the Applicant on arbitration and appeals resulted in a joint position paper and revised drafting in the dDCO. The Applicant proposed the same approach to the Norfolk

Vanguard OWF Order with Part 5 in dDCO, to which the MMO objected. However, both parties agreed to await the SoS's decision in relation to the Norfolk Vanguard OWF DCO to show the 'direction of travel'.

- 9.5.14. The SoS removed Part 5 in the made Order for the Norfolk Vanguard OWF, so both the Applicant and MMO agreed to the same approach for the Proposed Development [REP10-033], [REP13-035].
- 9.5.15. By the end of the Examination, the MMO [REP16-009], NE [REP16-010] and Trinity House [REP14-074] agreed that the 2011 Appeal Regulations would not be amended, and the arbitration rules in Schedule 15 of the dDCO [REP18-009] would be redrafted to ensure that all parties use reasonable endeavours to settle a dispute amicably. If after 20 business days, the dispute was not resolved then arbitration would commence. The Procedure for appeals which had formed Part 5 of all the DMLs (Schedules 9 to 13) as submitted at the time of application was therefore deleted by the Applicant from the dDCO [REP18-027, Ref 173].
- 9.5.16. The position reached provides consistency for the MMO and is now agreed between the parties. The ExA agrees with the amendments to Article 38 and the deletion of Part 5 of the DMLs (Schedules 9 to 13) and includes these in the rDCO.

SCHEDULE 16: Procedure for Discharge of Requirements, para 3(2)(c)

- 9.5.17. This was an SoS change to the Norfolk Vanguard OWF as-made order giving the SoS 28 days instead of 20 to appoint a person hear an appeal regarding discharge of Requirements [REP18-027, Ref 186].

9.6. OTHER CONSENTS

- 9.6.1. The consents that the Applicant has obtained or that the undertaker would need to obtain in addition to the DCO are listed in the Applicant's Consents and Licences Required under Other Legislation [REP2-003]. If an Order is made, the ExA considers that there is a reasonable likelihood of outstanding consents being granted.

9.7. OTHER AGREEMENTS

Planning Performance Agreements

- 9.7.1. There were no secured planning performance agreements (PPA) between the Applicant and any of the local planning authorities at the end of the Examination. However, there was some discussion during the Examination about future PPAs, which indicates an expectation on the part of the local authorities for PPAs to be put in place and a stated intent on the part of the Applicant to commit to PPAs with all the local planning authorities. All parties were content that the scope of and funding arrangements for PPAs would be negotiated post consent [EV6-005].

- 9.7.2. Subsequently, NCC made the point that financial reimbursement would be necessary for a PPA or equivalent mechanism for all local authorities involved in discharging DCO Requirements. This would need to include NCC in order for it to deliver the responsibility for providing information to the district councils in their role for discharging requirements [REP5-065, Q2.5.7.1].
- 9.7.3. As has been reported in Chapter 5, the ExA is concerned about the complexities of the approvals processes generally, and specifically in relation to the discharge of requirements in relation to the detailed design of the substations. Breckland Council has stated that it is content that it would work with the Applicant to identify the required resources and secure funding through the PPA process to engage consultants to assist with the substations design process [REP9-031, Q3.9.6.7].
- 9.7.4. The ExA has set out its views regarding the substations in a subsection of Section 5.3 of this Recommendation Report titled "*Post-consent discharge approvals by local planning authorities*". As there is no secured commitment to PPAs or any other mechanism, the ExA has given no weight to this matter in reaching its recommendations.

Side agreements

- 9.7.5. The Applicant had made extensive progress in agreeing Heads of Terms and negotiating Option Agreements with landowners. These matters are discussed in Chapter 8 of this Recommendation Report and are recorded in the Applicant's final form CAOS.
- 9.7.6. In addition, the Applicant refers to a number of specific agreements it intends to put in place should the Order be consented, as referred to in Chapters 5 and 8 of this Recommendation Report. These are:
- a. Co-operation Agreement between the Applicant and Norfolk Vanguard OWF;
 - b. Co-operation Agreement between the Applicant and Ørsted regarding Hornsea Project Three OWF; and
 - c. Crossing and Proximity Agreements with asset owners regarding offshore pipeline and cable crossings.
- 9.7.7. If minded to make the Order, the SoS may wish to satisfy themselves on progress with and the content of these agreements.

9.8. CONCLUSION

- 9.8.1. The ExA has had regard to all matters forming the application and put before it at the Examination, including the iterations of the dDCO. The ExA has also considered the Applicant's final dDCO [REP18-027].
- 9.8.2. It is the ExA's recommendation to withhold consent for the Order. However, should the SoS reach a different conclusion, then the ExA is satisfied that the rDCO adequately defines the scope of the Proposed

Development and secures the necessary controls and mitigation measures that are consistent with the assessments provided in the ES. The ExA also considers that the rDCO includes requirements that are necessary, relevant to planning, relevant to the development to be consented, enforceable, precise, and reasonable in all other respects as set out in EN-1 para.4.1.7.

10. SUMMARY OF FINDINGS AND CONCLUSIONS

10.1. INTRODUCTION

- 10.1.1. The ExA confirms that the application has been examined in the context of Section 104(2) of PA2008. The ExA has had regard to relevant National Policy Statements (NPSs), the Marine and Coastal Access Act 2009, Local Impact Reports, matters prescribed in relation to the Proposed Development and other matters that are both important and relevant to the decision.
- 10.1.2. The ExA has taken account of the national need for renewable energy NSIPs which weighs in favour of making the Order and the starting point of the NPSs, with a presumption in favour of granting consent to applications for renewable energy NSIPs. The ExA also notes that the need case for renewable energy has been strengthened since the NPS designation through amendments to the Climate Change Act setting a target of net zero emissions by 2050.
- 10.1.3. The ExA has considered whether changes to the application documents have changed to a point where it became a different application, and whether the SoS would therefore have power under s114 of PA2008 to make a DCO having regard to the DCO as applied for.
- 10.1.4. Having considered this context, the ExA is content that the changes to the application mainly consist of minor changes to the Application, (within the framework provided by the ES and technical revisions to the DCO as applied for), and the reduction in the number of WTGs in particular, have not resulted in any significant change to that which was applied for. It follows that the SoS has the power to make the Order as discussed in Chapter 9 and provided in Appendix D to this Recommendation Report.
- 10.1.5. The ExA confirms it is satisfied in relation to s104(3) that determining the application would be in accordance with the relevant NPSs except to the extent that s104(7) applies, because the ExA concludes that the adverse impact of the Proposed Development would outweigh its benefits.

10.2. CONSIDERATION OF FINDINGS AND CONCLUSIONS

- 10.2.1. The case for and against the Proposed Development is set out in Chapter 7 of this Recommendation Report. Having had regard to all the matters referred to in Chapter 7, the ExA's findings are that the matters weighing against the Order outweigh the matters in its favour. The ExA concludes the case for the Proposed Development is not made out.
- 10.2.2. The conclusions in earlier Chapters conflict with the NPSs and the Marine and Coastal Access Act 2009 for the following main reasons: firstly,

although the Applicant has sought to provide reasonable mitigation where possible and appropriate, there would be residual significant adverse effects when the Proposed Development is considered with other plans and projects at the EIA scale for:

- a. sandbank recovery from cable installation;
- b. loss of reef features due to cable installation;
- c. seabed topography, including sand waves, from cable installation and sand wave levelling;
- d. cumulative collision plus displacement of gannet; and
- e. cumulative collision for gannet, kittiwake, great black-backed gull, lesser black backed gull and herring gull.

10.2.3. Secondly, matters which weigh against the making of the Order to medium effect, which are:

- a. the totality of adverse effects related to onshore construction effects, namely traffic, visual and heritage effects, noise and vibration, water resources and flood risk, land use and agriculture, and physical and mental health; and
- b. adverse landscape and visual effects arising from the operational stage at the substations.

10.2.4. The ExA has listened carefully to the concerns of local people raised in submissions during the Examination by individuals and their representatives including Parish Councils, District and County Councillors and MPs. These concerns fall into two areas: concerns regarding the visual and landscape impacts of the proposed substations (operational stage); and impacts on communities in settlements along the construction access routes (construction stage). In both of these areas, cumulative impacts were raised as a particular concern.

10.2.5. In the case of the proposed substations, the ExA has considered the balance of the Applicant's need for flexibility in progressing the detail design with the strongly held community view that more detail is necessary. Notwithstanding the further detail provided by the Applicant during the Examination, the ExA has included an addition in its rDCO which requires post-consent details to be subject to an independent design review. The ExA has also drawn to the SoS's attention to the need for a holistic design approach in the case of Scenario 1.

10.2.6. The ExA has concluded that the adverse effects on the communities along the construction routes would be mitigated by the controls put in place for the Proposed Development, including the cumulative impacts assessed. However, this is not to understate the adverse effects that would arise and the impact that would be experienced by the local communities. The ExA also recognises that the sequential nature of cumulative impacts from construction activities for multiple developments would subject certain communities to effects over a number of years (although not continuously) in the vicinity of the Proposed Development.

- 10.2.7. Whilst the SoS is the Competent Authority under the Habitats Regulations, the ExA concludes that the requirements under Habitats Regulation 63 (for Appropriate Assessment of sites and features) and under Habitats Regulation 68 (to secure compensatory measures) have not been met.
- 10.2.8. Should the SoS agree with the ExA's conclusions on adverse effects on the integrity of European sites, it would then be necessary to consider the case for alternative solutions, imperative reasons of overriding public importance and compensatory measures; or to refuse to grant development consent.
- 10.2.9. The ExA has considered the compensatory measures proposed by the Applicant. But they have not reached the point of development where the ExA can be confident that the measures would be effective or could be successfully delivered. The ExA recommends that if the SoS wishes to consider these compensatory measures, further development of these proposals should be sought from the Applicant, in consultation with the relevant statutory nature conservation bodies.

10.3. RECOMMENDATION

- 10.3.1. For all the above reasons and in the light of the ExA's findings and conclusions on important and relevant matters set out in this Recommendation Report, the ExA under the Planning Act 2008 (as amended) recommends that the SoS should not make an Order granting development consent for the Norfolk Boreas Offshore Wind Farm.
- 10.3.2. In the event that the SoS disagrees, the ExA recommends that the SoS makes the Order subject to the modifications summarised in Chapter 9 of this Recommendation Report and set out in Appendix D.
- 10.3.3. The ExA also draws the SoS's attention to the areas of outstanding concern and matters which the ExA has advised the SoS may wish to pursue as summarised in Chapter 7 of this Recommendation Report. In particular, the SoS should satisfy themselves that compensatory measures identified in Chapter 6 for the features of the Alde-Ore SPA/Ramsar site, the Flamborough and Filey Coast SPA and the Haisborough, Hammond and Winterton SAC are secured; and residual significant adverse effects at the EIA level remain for:
- a. impact of collision and displacement from the Proposed Development on gannet;
 - b. cumulative collision impact for great black-backed gull and herring gull; and
 - c. cumulative displacement impact for red throated diver.
- 10.3.4. Furthermore, the SoS should satisfy themselves that the relevant local authorities are sufficiently equipped to enact their prescribed role in relation to the discharge of requirements.

- 10.3.5. If the SoS is minded to make the Order, in relation to the application for powers of Compulsory Acquisition (CA) within the Order the ExA concludes in Chapter 8 of this Recommendation Report that:
- a. The Applicant has shown that all reasonable alternatives to CA have been explored and that there are no alternatives which ought to be preferred.
 - b. The Applicant has demonstrated that the extent of land over which powers are sought would be no more than is reasonably required and it is proportionate to the needs of the Proposed Development.
 - c. the private loss to those affected has been mitigated to a large degree through the selection of the application land, the use of Temporary Possession to minimise permanent land-take and the extent of the rights and interests proposed to be acquired; and
 - d. the proposed interference with the human rights of individuals would be for a legitimate purpose, proportionate and justified in the public interest.
- 10.3.6. Taking these factors together, and only subject to the Order being made, the SoS can be satisfied that the application would comply with s122(3) of the PA2008, that the powers can be justified, and that they do not represent a disproportionate interference with the human rights of the affected parties. Similarly, the SoS can be satisfied that in respect of statutory undertakers, no element of the powers would substantially interfere with their ability to carry out their statutory duties.

APPENDICES

APPENDIX A: EXAMINATION LIBRARY	
APPENDIX B: LIST OF ABBREVIATIONS	
APPENDIX C: COMPULSORY ACQUISITION OBJECTIONS SCHEDULE.....	
APPENDIX D: THE RECOMMENDED DCO	