DOGGER BANK D
WIND FARM
Preliminary Environmental Information Report

Volume 1
Chapter 16 Aviation, Radar and Military

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Glossary

Term	Definition
Additional Mitigation	Measures identified through the EIA process that are required as further action to avoid, prevent, reduce or, if possible, offset likely significant adverse effects to acceptable levels (also known as secondary (foreseeable) mitigation). All additional mitigation measures adopted by the Project are provided in the Commitments Register.
Array Area	The area within which the wind turbines, inter-array cables and offshore platform(s) will be located.
Commitment	Refers to any embedded mitigation and additional mitigation, enhancement or monitoring measures identified through the EIA process and those identified outside the EIA process such as through stakeholder engagement and design evolution. All commitments adopted by the Project are provided in the Commitments Register.
Controlled airspace	Defined airspace within which pilots must follow Air Traffic Control instructions implicitly. In the UK, Classes A, C, D and E are areas of controlled airspace.
Design	All of the decisions that shape a development throughout its design and pre-construction, construction / commissioning, operation and, where relevant, decommissioning phases.
Deemed Marine Licence (DML)	A consent required under the Marine and Coastal Access Act 2009 for certain activities undertaken within the UK marine area, which may be granted as part of the Development Consent Order.
Development Consent Order (DCO)	A consent required under Section 37 of the Planning Act 2008 to authorise the development of a Nationally Significant Infrastructure Project, which is granted by the relevant Secretary of State following an application to the Planning Inspectorate.
Effect	An effect is the consequence of an impact when considered in combination with the receptor's sensitivity / value / importance, defined in terms of significance.
Embedded Mitigation	Embedded mitigation includes: • Measures that form an inherent part of the project design evolution such as modifications to the location or design of the development made during the pre-application phase (also known as primary (inherent) mitigation); and • Measures that will occur regardless of the EIA process as they are imposed by other existing legislative requirements or are considered as standard or best practice to manage commonly occurring environmental impacts (also known as tertiary (inexorable) mitigation). All embedded mitigation measures adopted by the Project are provided in the Commitments Register.
Enhancement	Measures committed to by the Project to create or enhance positive benefits to the environment or communities, as a result of the Project. All enhancement measures adopted by the Project are provided in the Commitments Register.
Environmental Impact Assessment (EIA)	A process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information and includes the publication of an Environmental Statement.
Environmental Statement (ES)	A document reporting the findings of the EIA which describes the measures proposed to mitigate any likely significant effects.
Evidence Plan Process (EPP)	A voluntary consultation process with technical stakeholders which includes a Steering Group and Expert Topic Group (ETG) meetings to encourage upfront agreement on the nature, volume and range of supporting evidence required to inform the EIA and HRA process.
Expert Topic Group (ETG)	A forum for targeted technical engagement with relevant stakeholders through the EPP.
Flight Information Region (FIR)	Airspace managed by a controlling authority with responsibility for ensuring air traffic services are provided to aircraft flying within it.
Flight Level (FL)	An aircraft altitude expressed in hundreds of feet at a standard sea level pressure datum of 1013.25 hectopascals.
Impact	A change resulting from an activity associated with the Project, defined in terms of magnitude.
Inter-Array Cables	Cables which link the wind turbines to the offshore platform(s).
Landfall	The area on the coastline, south-east of Skipsea, at which the offshore export cables are brought ashore, connecting to the onshore export cables at the transition joint bay above Mean High Water Springs.
Mitigation	Any action or process designed to avoid, prevent, reduce or, if possible, offset potentially significant adverse effects of a development. All mitigation measures adopted by the Project are provided in the Commitments Register.
Mitigation Hierarchy	A systematic approach to guide decision-making and prioritise mitigation design. The hierarchy comprises four stages in order of preference and effectiveness: avoid, prevent, reduce and offset.

Term	Definition
Monitoring	Measures to ensure the systematic and ongoing collection, analysis and evaluation of data related to the implementation and performance of a development. Monitoring can be undertaken taken by the Project to monitor conditions in the future to verify any environmental effects identified by the EIA, the effectiveness of mitigation or enhancement measures or ensure remedial action are taken should adverse effects above a set threshold occur. All monitoring measures adopted by the Project are provided in the Commitments Register.
Offshore Development Area	The area in which all offshore infrastructure associated with the Project will be located, including any temporary works area during construction, which extends seaward of Mean High Water Springs. There is an overlap with the Onshore Development Area in the intertidal zone.
Offshore Export Cable Corridor (ECC)	The area within which the offshore export cables will be located, extending from the DBD Array Area to Mean High Water Springs at the landfall.
Offshore Export Cables	Cables which bring electricity from the offshore platform(s) to the transition joint bay at landfall.
Offshore Platform(s)	Fixed structures located within the DBD Array Area that contain electrical equipment to aggregate and, where required, convert the power from the wind turbines, into a more suitable voltage for transmission through the export cables to the Onshore Converter Station. Such structures could include (but are not limited to): Offshore Converter Station(s) and an Offshore Switching Station.
Onshore Converter Station (OCS)	A compound containing electrical equipment required to stabilise and convert electricity generated by the wind turbines and transmitted by the export cables into a more suitable voltage for grid connection into Birkhill Wood Substation.
Onshore Development Area	The area in which all onshore infrastructure associated with the Project will be located, including any temporary works area required during construction and permanent land required for mitigation and enhancement areas, which extends landward of Mean Low Water Springs. There is an overlap with the Offshore Development Area in the intertidal zone.
Primary Surveillance Radar (PSR)	A radar system that measures the bearing and distance of targets using the detected reflections of radio signals.
Project Design Envelope	A range of design parameters defined where appropriate to enable the identification and assessment of likely significant effects arising from a project's worst-case scenario. The Project Design Envelope incorporates flexibility and addresses uncertainty in the DCO application and will be further refined during the EIA process.

Term	Definition
Radar Line of Sight (RLoS)	RLoS is the direct path from a radar to a target. Radio signals are generally bent or refracted downward in the earth's atmosphere, extending the radar horizon beyond the optical horizon. RLoS calculations account for refraction by assuming a 4/3 effective earth radius.
Safety Zones	A statutory, temporary marine zone demarcated for safety purposes around a possibly hazardous offshore installation or works / construction area.
Scoping Opinion	A written opinion issued by the Planning Inspectorate on behalf of the Secretary of State regarding the scope and level of detail of the information to be provided in the Applicant's Environmental Statement. The Scoping Opinion for the Project was adopted by the Secretary of State on 02 August 2024.
Scoping Report	A request by the Applicant made to the Planning Inspectorate for a Scoping Opinion on behalf of the Secretary of State. The Scoping Report for the Project was submitted to the Secretary of State on 24 June 2024.
Scour Protection	Protective materials used to avoid sediment erosion from the base of the wind turbine foundations and offshore platform foundations due to water flow.
Study Areas	A geographical area and / or temporal limit defined for each EIA topic to identify sensitive receptors and assess the relevant likely significant effects.
The Applicant	SSE Renewables and Equinor acting through 'Doggerbank Offshore Wind Farm Project 4 Projco Limited'.
The Project	Dogger Bank D Offshore Wind Farm Project, also referred to as DBD in this PEIR.
Transition Joint Bay (TJB)	An underground structure at the landfall that houses the joints between the offshore and onshore export cables.
Trenchless Techniques	Trenchless cable or duct installation methods used to bring offshore export cables ashore at landfall, facilitate crossing major onshore obstacles such as roads, railways and watercourses and where trenching may not be suitable. Trenchless techniques included in the Project Design Envelope include Horizontal Directional Drilling (HDD), auger boring, micro-tunnelling, pipe jacking / ramming and Direct Pipe.
Uncontrolled airspace	Defined airspace in which Air Traffic Control does not exercise exclusive authority but may provide basic information services to aircraft in radio contact. In the UK, Class G is uncontrolled airspace.
Visual meteorological conditions	Visual meteorological conditions are the meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling equal to or better than specified minima.

Term	Definition
Wind Turbines	Power generating devices located within the DBD Array Area that convert kinetic energy from wind into electricity.

16 Aviation, Radar and Military

16.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) presents the preliminary results of the Environmental Impact Assessment (EIA) of the Dogger Bank D Offshore Wind Farm Project (hereafter 'the Project' or 'DBD') on aviation, radar and military.

2. **Chapter 4 Project Description** provides a description of the key infrastructure components which form part of the Project and the associated construction, operation and maintenance (O&M) and decommissioning activities**.**

3. The primary purpose of the PEIR is to support the statutory consultation activities required for a Development Consent Order (DCO) application under the Planning Act 2008. The information presented in this PEIR chapter is based on the baseline characterisation and assessment work undertaken to date. The feedback from the statutory consultation will be used to inform the final project design where appropriate and presented in an Environmental Statement (ES), which will be submitted with the DCO application.

4. This PEIR chapter:

- Describes the baseline environment relating to aviation, radar and military;
- Presents an assessment of the likely significant effects on aviation, radar and military during the construction, operation and decommissioning phases of the Project;
- Identifies any assumptions and limitations encountered in compiling the environmental information; and
- Sets out proposed mitigation measures to avoid, prevent, reduce or, if possible, offset potential adverse environmental effects identified during the EIA process and, where relevant, monitoring measures or enhancement measures to create or enhance positive effects.

5. There are numerous potential impacts that the Project could have on aviation, radar and military. For example, offshore wind farm infrastructure can present a physical obstruction for aviation activities such as military low flying training, offshore helicopters supporting the oil and gas industry, and helicopters engaged in Search and Rescue (SAR) operations. Also, the rotating blades of wind turbines can be interpreted by aviation radars as aircraft which are subsequently shown on radar displays. These spurious or false radar returns are known as "clutter", and their appearance can affect the safe and efficient provision of Air Traffic Services (ATS). Clutter can mask unidentified aircraft from the radar air traffic controller or prevent the controller from accurately identifying aircraft under their control, or cause the track of an aircraft to be incorrectly displayed. In some cases, radar reflections from wind turbines can affect the performance of the radar itself.

6. Potential aviation, radar and military stakeholders include the aviation interests of the Ministry of defence (MOD), NATS (formerly National Air Traffic Services and currently comprising NATS (En-Route) plc (NERL) and NATS (Services) Limited (NSL)), regional airports, local aerodromes, and offshore helicopter operators such as Bristow Group, which currently delivers the UK SAR contract on behalf of His Majesty's Coastguard. The Civil Aviation Authority (CAA) is the UK's regulatory aviation stakeholder.

7. This chapter should be read in conjunction with the following related chapters. Inter-relationships are discussed further in **Section 16.10.1**:

- **Chapter 13 Offshore and Intertidal Ornithology** (due to the potential effect of aviation lighting);
- **Chapter 15 Shipping and Navigation** (due to marine activities associated with SAR operations); and
- **Chapter 18 Other Marine Users** (which considers military activities and oil and gas operations).

8. Additional information to support the aviation, radar and military assessment includes:

- **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military**; and
- **Volume 2, Appendix 16.2 Airspace Analysis and Radar Modelling**.

9. **Volume 2, Appendix 16.2 Airspace Analysis and Radar Modelling** identifies the radars that could potentially detect the Project wind turbines and gives details of the Radar Line of Sight (RLoS) analyses. It also sets out a detailed analysis of the airspace occupied by the DBD Array Area and summarises the effects that the Project could have on aviation activities in the vicinity.

16.2 Policy and Legislation

16.2.1 National Policy Statements

10. Planning policy on Nationally Significant Infrastructure Projects (NSIP) is set out in the National Policy Statements (NPS). The following NPS are relevant to the aviation, radar and military assessment:

    - Overarching NPS for Energy (EN-1) (DESNZ, 2023a); and
    - NPS for Renewable Energy Infrastructure (EN-3) (DESNZ, 2023b).

11. The aviation, radar and military chapter has been prepared with reference to specific requirements in the above NPS. The relevant parts of the NPS are summarised in **Table 16-1**, along with how and where they have been considered in this PEIR chapter.

16.2.2 Other Policy and Legislation

12. Other policy and legislation relevant to the aviation, radar and military assessment is summarised in the following sections.

16.2.2.1 International

13. The International Civil Aviation Organisation (ICAO) is responsible for setting aviation standards and recommended practices, as detailed in 19 Annexes. ICAO Annex 14 Aerodromes: Volume 1 Aerodrome Design and Operations (ICAO, 2022) includes recommendations for the marking and lighting of wind turbines.

16.2.2.2 National

14. The Air Navigation Order (ANO) 2016/765 (CAA, 2022a) implements the UK's obligations under the Chicago Convention on International Civil Aviation and regulates aspects of aviation safety. It provides regulatory and enforcement powers for the CAA needed in respect of retained safety legislation.

15. ANO Article 222 details the requirements for the lighting of en-route obstacles that are 150m or more above ground level.

16. ANO Article 223 modifies the requirements of Article 222 with respect to wind turbines in UK territorial waters of 60m or more above the level of the sea at the highest astronomical tide.

17. ANO Article 225A details the requirements for notifying the CAA of any planned works to erect new en-route obstacles that are 100m or more above sea level.

18. Civil Aviation Publication (CAP) 764: Policy and Guidelines on Wind Turbines (CAA, 2016) details the CAA policy and guidelines associated with wind turbine impacts on aviation that aviation stakeholders and wind energy developers need to consider when assessing a development's viability.

16.3 Consultation

19. Topic-specific consultation in relation to aviation, radar and military has been undertaken in line with the process set out in **Chapter 7 Consultation**. A Scoping Opinion from the Planning Inspectorate was received on 2nd August 2024, which has informed the scope of the assessment presented within this chapter (as outlined in **Section 16.4.2**).

20. **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military** summarises how consultation responses received to date are addressed in this chapter.

21. This chapter will be updated based on refinements made to the Project Design Envelope and to consider where appropriate stakeholder feedback on the PEIR. The updated chapter will form part of the ES to be submitted with the DCO application.

Table 16-1 Summary of Relevant National Policy Statement Requirements for Aviation, Radar and Military

NPS Reference and Requirement	How and Where Considered in the PEIR
NPS for Energy (EN-1)	
Paragraph 5.5.19: "New energy infrastructure may cause obstructions in MOD low flying areas. A balance must be struck between defence and energy needs in these areas."	Engagement with the MOD has been established and will continue as the Project design progresses (see **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military**). The development will be marked and lit in accordance with statutory requirements, as outlined in **Table 16-3**.
Paragraph 5.5.37: "Where the proposed development may affect the performance of civil or military aviation CNS[1], meteorological radars and/or other defence assets an assessment of potential effects should be set out in the ES."	Impacts on radars and radio navigation aids are scoped out of the assessment, with Planning Inspectorate agreement. The DBD Array Area is outside all Met Office meteorological radar consultation zones.
Paragraph 5.5.39: "The applicant should consult the MOD, Met Office, Civil Aviation Authority (CAA), NATS and any aerodrome – licensed or otherwise – likely to be affected by the proposed development in preparing an assessment of the proposal on aviation, meteorological or other defence interests."	Consultation has been established and will continue as the Project design progresses. Consultation undertaken is detailed in **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military**. The wind farm site is outside all Met Office consultation zones and in response to consultation (as detailed in **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military**) the Met Office has confirmed that it has no concerns.
Paragraph 5.5.40: "Any assessment of effects on aviation, meteorological or other defence interests should include potential impacts of the project upon the operation of CNS infrastructure, flight patterns (both civil and military), generation of weather warnings and forecasts, other defence assets (including radar) and aerodrome operational procedures. It should also assess the demonstratable cumulative effects of the project with other relevant projects in relation to aviation, meteorological and defence."	Potential effects of the Project are assessed in **Section 16.7**. Cumulative effects are assessed in **Section 16.8**. Impacts on meteorological interests have not been assessed as the wind farm site is outside all Met Office consultation zones.
Paragraph 5.5.42: "If any relevant changes are made to proposals during the pre-application and determination period, it is the responsibility of the applicant to ensure that the relevant aviation, meteorological and defence consultees are informed as soon as reasonably possible."	Any relevant changes will be communicated to aviation consultees in a timely manner.
Paragraph 5.5.43: "The applicant should include appropriate mitigation measures as an integral part of the proposed development."	Embedded mitigation is detailed in **Table 16-3**.
Paragraph 5.5.53: "If there are conflicts between the government's energy and transport policies and military interests in relation to the application, the Secretary of State should expect the relevant parties to have made appropriate efforts to work together to identify realistic and pragmatic solutions to the conflicts. In so doing, the parties should seek to protect the aims and interests of the other parties as far as possible, recognising simultaneously the evolving landscape in terms of the UK's energy security and the need to tackle climate change, which necessitates the installation of wind turbines and the need to maintain air safety and national defence and the national weather warning service."	The MOD has confirmed that the Project would not have any impact on its radars but has raised concerns regarding development within its danger areas. Potential impacts on MOD activities are assessed in **Section 16.7** and engagement with the MOD will continue to address any concerns (see **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military**).

[1] Communication, Navigation and Surveillance

NPS Reference and Requirement	How and Where Considered in the PEIR
Paragraph 5.5.54: "There are statutory requirements concerning lighting to tall structures. Where lighting is requested on structures that goes beyond statutory requirements by any of the relevant aviation and defence consultees, the Secretary of State should be satisfied of the necessity of such lighting taking into account the case put forward by the consultees. The effect of such lighting on the landscape and ecology may be a relevant consideration."	Marking and lighting statutory requirements are established as embedded mitigation, as detailed in **Table 16-3**. No lighting beyond statutory requirements has been requested to date by relevant consultees.
Paragraph 5.5.55: "Lighting must also be designed in such a way as to ensure that there is no glare or dazzle to pilots and/or ATC, aerodrome ground lighting is not obscured and that any lighting does not diminish the effectiveness of aeronautical ground lighting and cannot be confused with aeronautical lighting. Lighting may also need to be compatible with night vision devices for military low flying purposes."	In accordance with Air Navigation Order Article 223, lighting intensity would be reduced at and below the horizontal and further reduced when visibility in all directions from every wind turbine is more than 5km.
Paragraphs 5.5.59 and 5.5.60: "Where, after reasonable mitigation, operational changes, obligations and requirements have been proposed, the Secretary of State should consider whether: a development would prevent a licensed aerodrome from maintaining its licence and the operational loss of the said aerodrome would have impacts on national security and defence, or result in substantial local/national economic loss, or emergency service needs it would cause harm to aerodromes' training or emergency service needs the development would impede or compromise the safe and effective use of defence assets or unacceptably limit military training the development would have a negative impact on the safe and efficient provision of en-route air traffic control services for civil aviation, in particular through an adverse effect on CNS infrastructure the development would compromise the effective provision of weather warnings by the NSWWS, or flood warnings by the UK's flood agencies" "Provided that the Secretary of State is satisfied that the impacts of proposed energy developments do not present risks to national security and physical safety, and where they do, provided that the Secretary of State is satisfied that appropriate mitigation can be achieved, or appropriate requirements can be attached to any Development Consent Order to secure those mitigations, consent may be granted."	Potential effects on Beverley Airfield and MOD activities are assessed in **Section 16.7**. Impacts on radars and radio navigation aids are scoped out of the assessment, with Planning Inspectorate agreement. The DBD Array Area is outside all Met Office meteorological radar consultation zones and the Met Office has confirmed that it has no concerns (as detailed in **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military**).
NPS for Renewable Energy Infrastructure (EN-3)	
Paragraph 2.8.50: "The applicant will also need to consider impacts on civil and military radar and other aviation and defence interests (Section 5.5 of EN-1)."	Impacts on radars and radio navigation aids are scoped out of the assessment, with Planning Inspectorate agreement. Potential effects of the Project are assessed in **Section 16.7**.
Paragraph 2.8.240: "Aviation and navigation lighting should be minimised and/or on demand (as encouraged in EN-1 Section 5.5) to avoid attracting birds, taking into account impacts on safety."	In accordance with Air Navigation Order Article 223, lighting intensity would be reduced at and below the horizontal and further reduced when visibility in all directions from every wind turbine is more than 5km. Lighting effects on bird receptors is assessed within **Chapter 13 Offshore and Intertidal Ornithology**.

NPS Reference and Requirement	How and Where Considered in the PEIR
Paragraphs 2.8.261 and 2.8.262: "Detailed discussions between the applicant for the offshore wind farm and the relevant consultees should have progressed as far as reasonably possible prior to the submission of an application. As such, appropriate mitigation should be included in any application, and ideally agreed between relevant parties." "In some circumstances, the Secretary of State may wish to consider the potential to use requirements involving arbitration as a means of resolving how adverse impacts on other commercial activities will be addressed."	Consultation was initiated with NATS and the MOD at the Scoping stage. Further engagement with the MOD and other relevant aviation stakeholders will continue throughout the application process (see **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military**).
Paragraphs 2.8.342 to 2.8.344: "Where a proposed offshore wind farm potentially affects other offshore infrastructure or activity, a pragmatic approach should be employed by the Secretary of State." "Much of this infrastructure is important to other offshore industries as is its contribution to the UK economy." "In such circumstances, the Secretary of State should expect the applicant to work with the impacted sector to minimise negative impacts and reduce risks to as low as reasonably practicable."	Potential effects during the various phases are assessed in **Section 16.7**. Negative impacts would be minimised and risks reduced through the embedded mitigation measures detailed in **Table 16-3**.
Paragraphs 2.8.345 and 2.8.346: "As such, the Secretary of State should be satisfied that the site selection and site design of a proposed offshore wind farm and offshore transmission has been made with a view to avoiding or minimising disruption or economic loss or any adverse effect on safety to other offshore industries. Applicants will be required to demonstrate that risks to safety will be reduced to as low as reasonably practicable." "The Secretary of State should not consent applications which pose intolerable risks to safety after mitigation measures have been considered."	The DBD Array Area location is positioned to minimise effects to other offshore industries. As discussed in **Section 16.6.1.3** and **Section 0** there are no helicopter routes or oil and gas platforms in the vicinity of the infrastructure within the DBD Array Area.
Paragraph 2.8.348: "Providing proposed schemes have been carefully designed, and that the necessary consultation with relevant bodies and stakeholders has been undertaken at an early stage, mitigation measures may be possible to negate or reduce effects on other offshore infrastructure or operations to a level sufficient to enable the Secretary of State to grant consent."	Embedded mitigation is detailed in **Table 16-3**. Consultation with relevant aviation stakeholders will continue throughout the application process.

16.4 Basis of the Assessment

22. The following sections establish the basis of the assessment of likely significant effects, which is defined by the Study Area(s), assessment scope, and realistic worst-case scenarios. This section should be read in conjunction with **Volume 2, Appendix 6.2 Impacts Register** and **Volume 2, Appendix 6.3 Commitments Register** which are provided alongside the PEIR.

16.4.1 Study Area

23. In considering the spatial coverage of the aviation, radar and military Study Area, the overriding factor is the potential for wind turbines within the DBD Array Area to have an impact on civil and military radars, taking into account required radar operational ranges.

24. In general, Primary Surveillance Radars (PSR) installed on civil and military airfields have an operational range of between 40 nautical miles (nm) and 60nm. There are no radar-equipped airfields within 60nm of the DBD Array Area. The closest airfield PSR is at Humberside Airport, 141nm south-west of the DBD Array Area.

25. En-route radars operated by NATS and MOD Air Defence (AD) radars are required to provide coverage at ranges in excess of 60nm. Such radars with potential RLoS of wind turbines within the DBD Array Area include the NATS facilities at Claxby, Cromer and Great Dun Fell and the MOD AD facilities at Brizlee Wood, Staxton Wold, and Neatishead. RLoS modelling detailed in **Volume 2, Appendix 16.2 Airspace Analysis and Radar Modelling** indicates that wind turbines and other tall obstacles within the DBD Array Area would not be visible to these or any other radar facilities.

26. The ICAO document EUR Doc 015 European Guidance Material on Managing Building Restricted Areas (ICAO, 2015) details safeguarding criteria to protect the radio signals of Communication, Navigation and Surveillance (CNS) facilities from interference caused by buildings or other large objects. For surveillance facilities such as PSRs the safeguarded zone extends from the facility to a radius of 15km (**Figure 16-1**). The Onshore Development Area is more than 15km from any PSRs and therefore impacts on PSRs are not considered further.

27. A NATS en-route radio navigation aid facility known as Ottringham VOR / DME (VHF Omni Directional Range / Distance Measuring Equipment) is sited approximately 22km south-east of the Onshore Development Area. NATS apply a 10km safeguarded zone around VOR / DME facilities, which is in line with the recommendation in EUR Doc 015 for protection from wind turbine interference. However, the safeguarded zone is reduced to 3km for other obstacles, which is more appropriate for any infrastructure within the Onshore Development Area (**Figure 16-1**). The Onshore Development Area is beyond the safeguarded zones of all other known radio navigation aids and therefore impacts on such facilities are not considered further.

28. Having excluded radar and radio navigation aid receptors from further assessment, the aviation, radar and military Study Area has been defined as the airspace and aviation receptors within an area extending 9nm (16.7km) around the Offshore and Onshore Development Areas (**Figure 16-1** and **Figure 16-2**). The 9nm buffer accounts for potential obstacle impacts on the safe operation of helicopter low visibility approaches in poor weather conditions to offshore helidecks and is discussed further in **Section 0**. The buffer is also considered to be a conservative range for encompassing other aviation receptors that could be impacted by the various phases of the Project.

16.4.2 Scope of the Assessment

29. Wind turbines have the potential to affect civil and military aviation (fixed-wing and helicopters), either through their physical presence limiting access and affecting safe passage, or through their impacts on PSR systems which can affect the safe provision of an ATS.

30. PSR impacts are caused by the characteristics of rotating wind turbine blades being similar to those of aircraft, leading to spurious clutter on Air Traffic Control (ATC) radar displays.

31. The creation of a new obstacle environment increases the risk of collision for military low flying aircraft, helicopters in support of the oil and gas industry, and SAR operations.

32. Helicopter traffic as a result of planned activities in support of the Project may raise the overall level of air traffic in the area and increase the likelihood of aircraft-to-aircraft collision.

33. A number of impacts have been scoped out of the aviation, radar and military assessment. These impacts are outlined in the Impacts Register provided in **Volume 2, Appendix 6.2 Impacts Register**, along with supporting justification and are in line with the Scoping Opinion (discussed in **Section 16.3**) and the project description outlined in **Chapter 4 Project Description**.

34. Impacts scoped into the assessment relating to aviation, radar and military are outlined in **Table 16-2** and discussed further in **Section 16.7**.

Figure 16-1 Aviation, Radar and Military Onshore Receptors

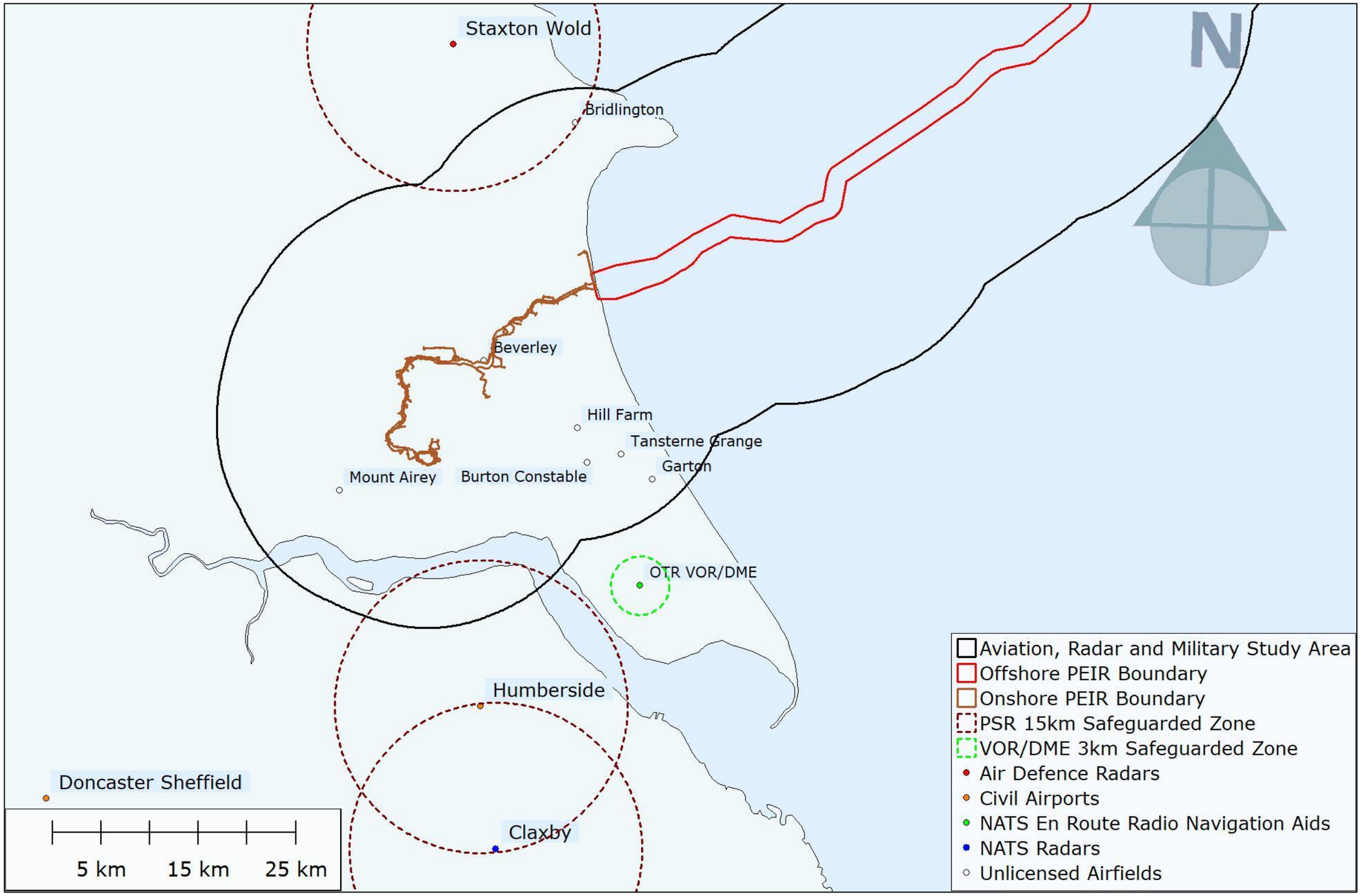


Figure 16-2 Aviation, Radar and Military Study Area

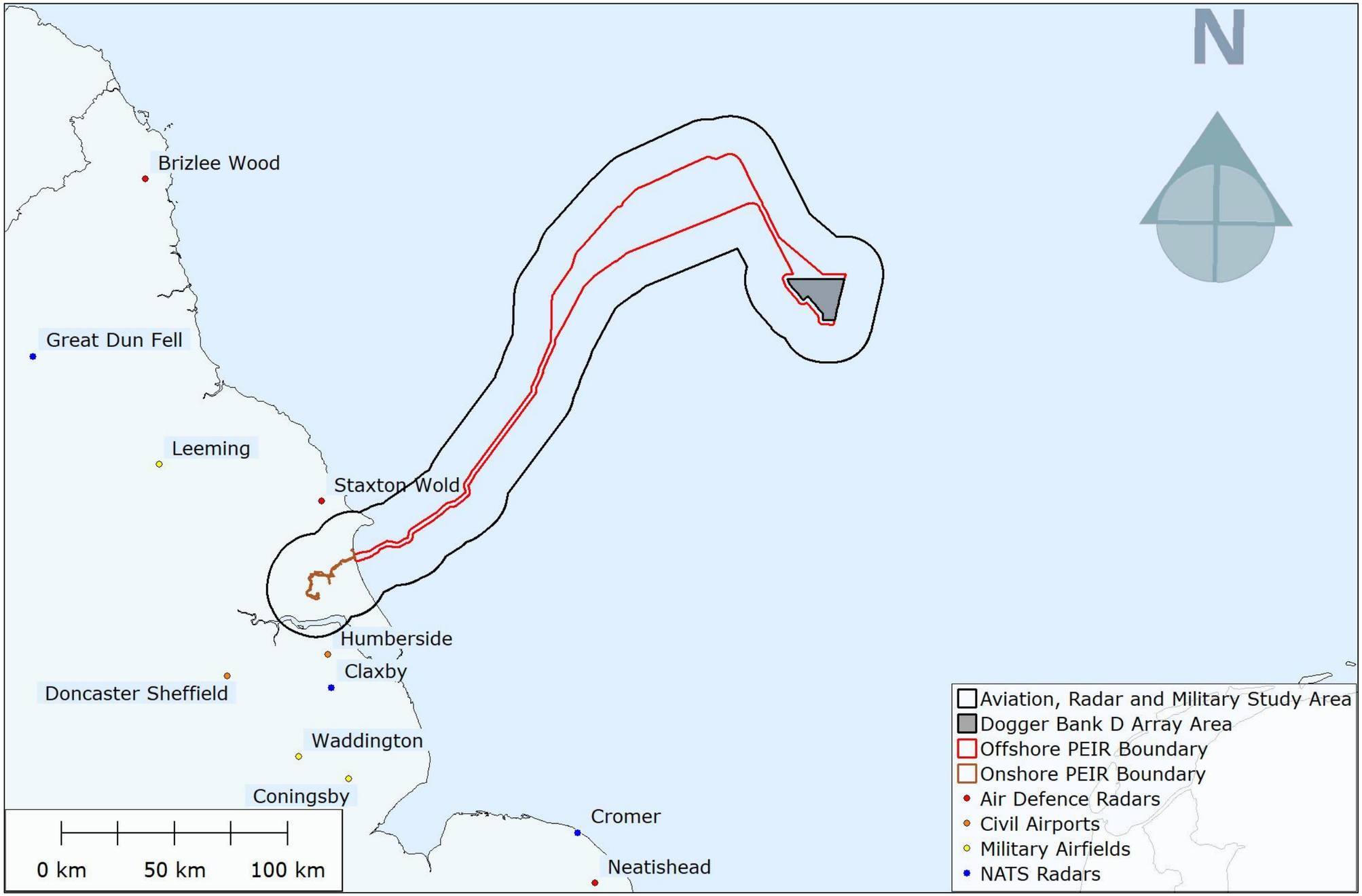


Table 16-2 Aviation, Radar and Military – Impacts Scoped into the Assessment

Impact ID	Impact and Project Activity	Rationale
Construction		
ARM-C-03	Creation of an aviation obstacle environment – installation of above sea level infrastructure.	The presence of construction infrastructure, including tall crane vessels, and installation of infrastructure above sea level could pose a physical obstruction to low flying aircraft, increasing the risk of collision and requiring aircraft to fly extended routes to avoid obstacles.
ARM-C-04	Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	Helicopter traffic associated with the construction phase could impact on existing air traffic in the vicinity, increasing the risk of aircraft collision.
ARM-C-05	Impact of the offshore export cable route on Staxton Danger Area activities – installation of the offshore export cable.	Vessels and personnel engaged in cable installation could interfere with military training activities.
ARM-C-06	Impacts of onshore infrastructure on airfield operations – installation of the onshore export cables and construction of onshore infrastructure.	Construction of infrastructure within the Onshore Development Area could have an impact on activities at Beverley Airfield.
Operation & Maintenance		
ARM-O-03	Creation of an aviation obstacle environment – presence of wind turbines and offshore substation platforms.	The presence of completed wind turbines and other infrastructure within the OCS zone above sea level could pose a physical obstruction to low flying aircraft, increasing the risk of collision and requiring aircraft to fly extended routes to avoid obstacles.
ARM-O-04	Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	Helicopter traffic associated with maintenance activities could impact on existing air traffic in the vicinity, increasing the risk of aircraft collision.
ARM-O-05	Impact of the offshore export cable route on Staxton Danger Area activities – offshore export cable repair or replacement activities.	Vessels and personnel engaged in cable maintenance activities could interfere with military training activities.
ARM-O-06	Impacts of onshore infrastructure on airfield operations – presence of onshore infrastructure.	The presence of infrastructure, specifically tall buildings and / or stacks, within the Onshore Development Area could have an impact on activities at Beverley Airfield.
Decommissioning		
ARM-D-03	Creation of an aviation obstacle environment – decommissioning activities not yet defined.	The presence of surface structures within the Array Area and operation and maintenance activities associated with the Array Area and offshore ECC may result in an increased likelihood of an incident occurring which requires an emergency response and may reduce access for surface air responders, including SAR assets. Decommissioning impacts are scoped in; however, details of offshore decommissioning activities are not known at this stage. Decommissioning impacts will be assessed in detail through the Offshore Decommissioning Programme (see **Table 16-3**, Commitment ID CO21) where relevant, which will be developed prior to the construction of the offshore works. In this assessment, it is assumed that most decommissioning activities would be the reverse of their construction counterparts, and that their impacts would be of similar nature to, and no worse than, those identified during the construction phase. Consequently, decommissioning activities and infrastructure removal within the Onshore Development Area could have an impact on activities at Beverley Airfield.
ARM-D-04	Increased air traffic in the area related to wind farm activity – decommissioning activities not yet defined.	
ARM-D-05	Impact of the offshore export cable route on Staxton Danger Area activities – decommissioning activities not yet defined.	
ARM-D-06	Impacts of onshore infrastructure on airfield operations – decommissioning activities not yet defined.	

35. A full list of impacts scoped in / out of the aviation, radar and military assessment is summarised in the Impacts Register provided in **Volume 2, Appendix 6.2 Impacts Register**. A description of how the Impacts Register should be used alongside the PEIR chapter is provided in **Chapter 6 Environmental Impact Assessment Methodology**.

16.4.3 Embedded Mitigation Measures

36. Full details of all commitments made by the Project are provided within the Commitments Register in **Volume 2, Appendix 6.3 Commitments Register**, and those relevant to this topic are presented in **Table 16-3**. A description of how the Commitments Register should be used alongside the PEIR chapter is provided in **Volume 2, Appendix 1.2 Guide to PEIR** and **Chapter 6 Environmental Impact Assessment Methodology**. In addition, a list of draft outline management plans which are submitted with the PEIR for consultation is provided in **Section 1.10** of **Chapter 1 Introduction**. These documents will be further refined and submitted along with the DCO application. See **Volume 2, Appendix 1.2 Guide to PEIR** for a list of all PEIR documents.

37. **Volume 2, Appendix 6.3 Commitments Register** is provided at PEIR stage to provide stakeholders with an early opportunity to review and comment on the proposed commitments. Proposed commitments may evolve during the pre-application phase as the EIA progresses and in response to refinements to the Project Design Envelope and stakeholder feedback. The final commitments will be confirmed in the Commitments Register submitted along with the DCO application.

16.4.4 Realistic Worst-Case Scenarios

38. To provide a precautionary, but robust, assessment at this stage of the Project's development process, a realistic worst-case scenario has been defined in **Table 16-4** for each impact scoped into the assessment (as outlined in **Section 16.4.2**). The realistic worst-case scenarios are derived from the range of parameters included in the design envelope. They ensure that the assessment of likely significant effects is based on the maximum potential impact on the environment. Should an alternative development scenario be taken forward in the final design of the Project, the resulting effects would not be greater in effect significance. Further details on the design envelope approach are provided in **Chapter 6 Environmental Impact Assessment Methodology**.

39. Following the PEIR publication and statutory consultation, further design refinements will be made based on ongoing engineering studies and considerations of the EIA and consultation feedback. Therefore, realistic worst-case scenarios presented in the PEIR may be updated in the ES. The design envelope will be refined where possible to retain design flexibility only where it is needed.

Table 16-3 Embedded Mitigation Measures Relevant to Aviation, Radar and Military

Commitment ID	Proposed Embedded Mitigation	How the Commitment will be Secured	Relevance to Aviation, Radar and Military Assessment	Relevance to Impact ID
CO7	The Project will ensure compliance with Marine Guidance Note (MGN) 654 and its annexes, where applicable, including implementation of an Emergency Response Cooperation Plan (ERCoP) for all phases of the Project and completion of a Search and Rescue (SAR) checklist.	DML Condition - Emergency Response and Cooperation Plan	An ERCoP will ensure SAR resources have the required Project details for emergency situations.	ARM-C-03 ARM-O-03
CO8	The Defence Infrastructure Organisation and the Civil Aviation Authority (CAA) will be informed of the locations, heights and lighting status of the wind turbines, including estimated and actual dates of construction and the maximum height of any construction equipment to be used, prior to the start of construction, to allow inclusion on Aviation Charts in line with Article 225a of the Air Navigation Order.	DML Condition	Information notification and charting alerts aviation stakeholders to the presence of the Project.	ARM-C-03 ARM-O-03
CO9	Aids to navigation (marking and lighting) will be deployed in accordance with the latest relevant available standard industry guidance and as advised by Trinity House, Maritime and Coastguard Agency (MCA) and Civil Aviation Authority (CAA) and Ministry of Defence (MoD) as appropriate. This will include a buoyed construction area around the Array Area. Consultation with Trinity House, MCA, and CAA will occur to determine appropriate lighting and marking.	DML Condition - Aids to Navigation Plan	Marking and lighting increases the visibility of offshore infrastructure for aviation stakeholders.	ARM-C-03 ARM-O-03
CO21	An Offshore Decommissioning Programme will be provided prior to the construction of the offshore works and implemented at the time of decommissioning, based on the relevant guidance and legislation.	DCO Requirement - Offshore Decommissioning Programme	The development and agreement of a Decommissioning Programme will ensure that the process of decommissioning the Project minimises shipping and navigation effects.	ARM-D-03
CO24	A Cable Specification and Installation Plan will be provided and submitted for approval prior to offshore construction. The Cable Specification and Installation Plan will detail the methods used for construction of offshore export and inter-array cables. Where possible, cable burial will be the preferred method for cable protection. Where cable protection is required, this will be minimised so far as is feasible. All cable protection will adhere to the requirements of Marine Guidance Note (MGN) 654 with respect to changes greater than 5% to the under-keel clearance in consultation with the Maritime and Coastguard Agency (MCA) and Trinity House. Any damage, destruction or decay of cables must be notified to the MCA, Trinity House, Kingfisher and UK Hydrographic Office (UKHO) no later than 24 hours after being discovered.	DML Condition - Cable Specification and Installation Plan	An Offshore Cable Installation Plan could be used to inform the MOD of cable laying activities.	ARM-C-05
CO28	An Offshore Operations and Maintenance Plan (O&M) will be provided prior to commencement of operation and will outline the reasonably foreseeable O&M offshore activities.	DML Condition - Offshore Operations and Maintenance Plan	An Offshore Operations and Maintenance Strategy could be used to inform SAR resources of helicopter traffic engaged in works on the Project.	ARM-O-04

Table 16-4 Realistic Worst-Case Scenarios for Impacts on Aviation, Radar and Military

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
Construction			
ARM-C-03	Creation of an aviation obstacle environment – installation of above sea level infrastructure.	59 wind turbines with a maximum blade tip height of 370m above Highest Astronomical Tide (HAT), or 113 wind turbines with a maximum blade tip height of 269m above HAT. Two Offshore Substation Platforms (OSPs) maximum topside height excluding lightning antenna of 65m above Lowest Astronomical Tide (LAT). High crane installation vessels. Construction period of five years.	Considers the tallest wind turbines and the maximum number of lowest height wind turbines for the Project. (Either of the above scenarios could be worst-case and both have been assessed for all impacts). Maximum physical obstruction to aviation operations due to the size and number of above sea level infrastructure within the DBD Array Area. Potential impacts starting from a point of zero infrastructure present to full presence over the construction period.
ARM-C-04	Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	Up to 2,730 helicopter round trips throughout construction period. Construction period of five years.	Helicopter trips as a result of being engaged in works on the Project causing increased likelihood of aircraft to aircraft collision.
ARM-C-05	Impact of the offshore export cable route on Staxton Danger Area activities – installation of the offshore export cable.	Three cable lay vessels, 24 vessel round trips. 12 support vessels, 288 vessel round trips. 45 guard vessels on the export cable route at any one time. Construction period of five years.	Maximum number of vessels potentially interfering with Staxton Danger Area activities.
ARM-C-06	Impacts of onshore infrastructure on airfield operations – installation of the onshore export cables and construction of onshore infrastructure.	Plant equipment – mechanical excavators, trenchers etc. Maximum number of trenches of HVDC onshore export cables: 2 Maximum number of trenches of HVAC onshore export cables: 4 Indicative temporary construction corridor width for HVDC onshore export cables: 32m (50m at trenchless crossing locations) Indicative temporary construction corridor width for HVAC onshore export cables: 55m (60m at trenchless crossing locations) Indicative number of main construction compounds for onshore export cable works: 4 Indicative number of intermediate construction compounds for onshore export cable works: 8 Indicative number of trenchless crossing locations: 70 Indicative main construction compound area: 20,000m^2 (per compound) Indicative intermediate construction compound area: 5,625m^2 (per compound) Indicative trenchless installation compound area for HVDC export cables: 300m^2 (5,625m^2 for non-HDD techniques) (per compound) Indicative trenchless installation compound area for HVAC export cables: 800m^2 (5,625m^2 for non-HDD techniques) (per compound)	Greatest number of structures and maximum width of cable corridor with potential to impact operations at Beverley Airfield.

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
		Maximum developable area for OCS and ESBI: 25ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement) Total permanent area: 20.5ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement) Total temporary area: 4.5ha (including 2 temporary construction compounds for the OCS and ESBI) Anticipated total duration of onshore construction works: approximately five years	
Operation			
ARM-O-03	Creation of an aviation obstacle environment – presence of wind turbines and offshore substation platforms.	59 wind turbines with a maximum blade tip height of 370m above HAT, or 113 wind turbines with a maximum blade tip height of 269m above HAT. 2 Offshore Substation Platforms (OSPs) maximum topside height excluding lightning antenna of 50m LAT. Operational lifetime of 35 years.	Considers the tallest wind turbines and the maximum number of lowest height wind turbines for the Project. (Either of the above scenarios could be worst-case and both have been assessed for all impacts). Maximum physical obstruction to aviation operations due to the size and number of above sea level infrastructure within the DBD Array Area.
ARM-O-04	Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	Up to 24 helicopter round trips per year over the operation and maintenance phase. Operational lifetime of 35 years.	Helicopter trips as a result of being engaged in works on the Project causing increased likelihood of aircraft to aircraft collision.
ARM-O-05	Impact of the offshore export cable route on Staxton Danger Area activities – offshore export cable repair or replacement activities.	Cable lay vessel with offshore support vessel or offshore construction vessel. Up to three vessels at any one time for three month visit duration. Up to 35 visits to offshore ECC over operational lifetime of 35 years.	Maximum number of vessels potentially interfering with Staxton Danger Area activities.
ARM-O-06	Impacts of onshore infrastructure on airfield operations – presence of onshore infrastructure.	Maximum developable area for OCS and ESBI: 25ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement) Total permanent area: 20.5ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement) Maximum number of OCS: 1 Indicative number of OCS buildings: 3 (excluding smaller shed structures) Maximum OCS building height: 25m Maximum OCS outdoor electrical equipment height: 30m Indicative number of battery block and composition for ESBI: 50 (each block with up to 24 battery units and 2 power conversion system (PCS) units) Indicative battery unit dimensions (length-width-height): 20m x 5m x 4m Indicative PCS unit dimensions (length-width-height): 6.1m x 2.5m x 4m Indicative number of ESBI buildings: 6 (excluding smaller shed structures)	Maximum height of onshore infrastructure with potential to impact operations at Beverley Airfield.

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
		Maximum ESBI building height: 20m Maximum ESBI outdoor electrical equipment height: 25m Operational lifetime of 35 years.	
Decommissioning			
ARM_D_03 ARM_D_04 ARM_D_05 ARM_D_06	The final decommissioning strategy of the Project's offshore infrastructure has not yet been decided. For a description of potential offshore decommissioning works, refer to **Chapter 4 Project Description**. It is recognised that regulatory requirements and industry best practice change over time. Therefore, the details and scope of offshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning. Specific arrangements will be detailed in an Offshore Decommissioning Plan (see **Table 16-3**, Commitment ID CO21), which will be submitted and agreed with the relevant authorities prior to the commencement of offshore decommissioning works. For this assessment, it is assumed that decommissioning is likely to operate within the parameters identified for construction (i.e. any activities are likely to occur within the temporary construction working areas and require no greater amount or duration of activity than assessed for construction). The decommissioning sequence will generally be the reverse of the construction sequence. It is therefore assumed that decommissioning impacts would likely be of similar nature to, and no worse than, those identified during the construction phase.		

16.5 Assessment Methodology

16.5.1 Guidance Documents

40. The following guidance documents have been used to inform the baseline characterisation, assessment methodology and mitigation design for aviation, radar and military:

- CAP 168: Licensing of Aerodromes (CAA, 2022b) sets out the standards required at UK licensed aerodromes relating to management systems, operational procedures, physical characteristics, assessment and treatment of obstacles and visual aids;
- CAP 764: Policy and Guidelines on Wind Turbines (CAA, 2016) details the CAA policy and guidelines associated with wind turbine impacts on aviation that aviation stakeholders and wind energy developers need to consider when assessing a development's viability;
- CAP 670: Air Traffic Services Safety Requirements (CAA, 2019) sets out the safety regulatory framework and highlights the requirements to be met by providers of civil ATSs and other services in the UK in order to ensure that those services are safe for use by aircraft;
- CAP 793: Safe Operating Practices at Unlicensed Aerodromes (CAA, 2010) provides guidance on the recommended layout, physical characteristics and visual aids appropriate to safe operating practices at unlicensed aerodromes;
- CAP 437: Standards for Offshore Helicopter Landing Areas (CAA, 2023) provides the criteria applied by the CAA in assessing offshore helicopter landing areas for worldwide use by helicopters registered in the UK, and includes winching area 'best practice' design criteria for wind turbine platforms;
- CAP 032: UK Aeronautical Information Publication (AIP) (CAA, 2024) is the main resource for information on facilities, services and flight procedures at all licensed UK airports, as well as UK airspace rules, regulations and restrictions, en route procedures, charts and other air navigation information;
- ICAO EUR DOC 015: European Guidance Material on Managing Building Restricted Areas (ICAO, 2015) proposes harmonised protection zones for CNS facilities to avoid buildings causing unacceptable signal interference;
- UK Military AIP (MOD, 2024) is the main resource for information and flight procedures at all military aerodromes;
- MOD Obstruction Lighting Guidance (MOD, 2020) details MOD requirements for the lighting of offshore developments;
- Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654: Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (MCA, 2021) highlights issues to consider when assessing navigational safety and emergency response, caused by OREI developments; and
- MCA document: Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for SAR and Emergency Response (MCA, 2024) forms part of MGN 654 Annex 5.

16.5.2 Data and Information Sources

16.5.2.1 Desk Study

41. A desk study has been undertaken to compile baseline information in the previously defined Study Area(s) (see **Section 22**) using the sources of information set out in **Table 16-5**.

Table 16-5 Desk-Based Sources for Aviation, Radar and Military Data

Data Source	Spatial Coverage	Year(s)	Summary of Data Contents
CAP 032: UK AIP	Full coverage of the aviation, radar and military Study Area.	2024	Contains information on facilities, services, rules, regulations, and restrictions in UK airspace.
UK Military AIP	Full coverage of the aviation, radar and military Study Area.	2024	The main resource for information and flight procedures at all UK military aerodromes.
Wind farm self-assessment maps	Full coverage of the aviation, radar and military Study Area.	2012	Maps provided by NATS to ascertain potential impacts of wind turbines on their en-route electronic infrastructure.
North Sea Transition Authority (NSTA) offshore infrastructure data	Full coverage of the aviation, radar and military Study Area.	2024	Regularly updated NSTA offshore shapefiles.
Office of Communications (Ofcom) Protected Radar List	Full coverage of the aviation, radar and military Study Area.	2024	Lists the locations and antenna heights of UK civil and military PSRs.
Met Office planning maps	Full coverage of the aviation, radar and military Study Area.	2015	Online maps of consultation zones for safeguarding UK weather radar sites.

16.5.2.2 Site-Specific Surveys

42. No site-specific surveys were undertaken for the aviation, radar and military assessment.

16.5.3 Impact Assessment Methodology

43. **Chapter 6 Environmental Impact Assessment Methodology** sets out the overarching approach to the impact assessment methodology. The topic-specific methodology for the aviation, radar and military assessment is described further in this section.

16.5.3.1 Impact Assessment Criteria

16.5.3.1.1 Effect Significance

44. For the purposes of this assessment no detailed grading has been made of the sensitivity of receptors or the magnitude of impacts on the basis that any potential impact on aviation stakeholders that restricts operations or causes a potential reduction in aviation safety should not be tolerated. Instead, the following definitions of basic significance have been used as defined in **Table 16-6**. An effect significance of **moderate** or **major** is considered significant in EIA terms. This represents a deviation from the standard methodology presented within **Chapter 6 Environmental Impact Assessment Methodology**.

Table 16-6 Definition of Effect Significance

Significance	Definition
Major	Receptor would be unable to continue safe operations or safe provision of air navigation services (radar) or effective air defence surveillance in the presence of the wind turbines. Technical or operational mitigation of the impact would be required.
Moderate	Receptor would be able to continue safe operations but with some restrictions in place.
Minor	The Project would have little effect on the aviation receptor, or the level of effect would be acceptable to the aviation receptor.
Negligible	The Project would have no effect on the aviation receptor and would be acceptable to the aviation receptor.

16.5.4 Cumulative Effects Assessment Methodology

45. The cumulative effects assessment (CEA) considers other plans and projects that may act collectively with the Project to give rise to cumulative effects on aviation, radar and military receptors. The general approach to the CEA for aviation, radar and military involves screening for potential cumulative effects, identifying a short list of plans and projects for consideration and evaluating the significance of cumulative effects. **Chapter 6 Environmental Impact Assessment Methodology** and **Volume 2, Appendix 6.4 Cumulative Effects Screening Report – Offshore** provides further details on the general framework and approach to the CEA.

46. For aviation, radar and military, the potential cumulative activities include other offshore wind farms, Cumulative effects have been considered with respect to obstacles and increase in air traffic.

16.5.5 Transboundary Effects Assessment Methodology

47. The transboundary effects assessment considers the potential for effects to occur as a result of the Project on aviation, radar and military receptors within the Exclusive Economic Zone (EEZ) of other European Economic Area (EEA) member states or other interests of EEA member states. **Chapter 6 Environmental Impact Assessment Methodology** provides further details on the general framework and approach to the transboundary effects assessment.

48. For aviation, radar and military, the potential for transboundary effects has been identified in relation to obstacles to flight, increase in air traffic, radar visibility and airspace management.

16.5.6 Assumptions and Limitations

49. This chapter provides a preliminary assessment of the likely significant effects of the Project in relation to aviation, radar and military using information available at the time of drafting as described in Chapter 6 Environmental Impact Assessment Methodology. This assessment will be refined where relevant and presented in the ES to be submitted with the DCO application.

50. Where routine assumptions have been made in the course of undertaking the assessment, these are noted throughout.

16.6 Baseline Environment

16.6.1 Existing Baseline

16.6.1.1 Civil Aviation

51. There are no licenced civil or military airfields or radars within the aviation, radar and military Study Area.

52. There are several unlicensed airfields in the vicinity of the Onshore Development Area (**Figure 16-1**). Guidance in CAP 764 (CAA, 2016) states that wind turbine developments within 3km of non-radar equipped unlicensed aerodromes with a runway of less than 800m might have an impact on operations. This guidance can also be applied for other tall buildings and / or stacks that may be constructed within the Onshore Development Area. Beverley Airfield lies adjacent to the Onshore Development Area. There are no other airfields within 3km of the Onshore Development Area.

53. The airspace above the aviation, radar and military Study Area is used by civil and military aircraft and lies within the London and Scottish Flight Information Regions (FIRs) which together form the UK FIR. This airspace is regulated by the UK CAA. The northern three quarters of the DBD Array Area is within the Scottish FIR while the southern quarter is within the London FIR (**Figure 16-3**). From sea level to Flight Level (FL) 195, approximately 19,500ft amsl, the airspace is Class G uncontrolled airspace. Above FL195 is Class C controlled airspace.

54. The boundary of the Scottish FIR with the Copenhagen FIR (regulated by the Danish Civil Aviation and Railway Authority) lies 122km east of the DBD Array Area at its nearest point. The boundary of the London FIR with the Amsterdam FIR (regulated by the Netherlands Inspectie Leefomgeving en Transport) lies 109km to the south-east of the DBD Array Area at its nearest point. A portion of UK FIR airspace known as North Sea Area V is delegated to the Netherlands. The eastern boundary of the DBD Array Area lies along the western boundary of North Sea Area V (**Figure 16-3**). Within this airspace the Netherlands provides an ATS to all aircraft between sea level and FL55, approximately 5,500ft amsl.

55. NERL provides en-route civil ATS within the UK FIR, except in areas such as Area V, where responsibility for ATS has been formally delegated to the Netherlands. NERL services are supported by a network of radar facilities which provide en-route information for both civil and military aircraft.

56. To enhance flight safety and expedite SAR operations over the southern North Sea, various Flight Information Services are provided by NATS Anglia Radar based at Aberdeen Airport. These services are available to helicopters operating in support of the offshore oil and gas and renewables industries and other civil and military aircraft transiting the airspace. The Anglia Radar Area of Responsibility, in which these services are available, extends from sea level to FL65 (approximately 6,500ft amsl). The southern quarter of the DBD Array Area is within the Anglia Radar Area of Responsibility (**Figure 16-3**).

16.6.1.2 Military Aviation

57. Staxton Danger Area EGD412 lies more than 86km west of the DBD Array Area but is infringed by some of the offshore export cable corridor (ECC) (**Figure 16-3**). This airspace extends from the surface to 10,000ft amsl. Activities within Staxton Danger Area include ordnance, munitions and explosives.

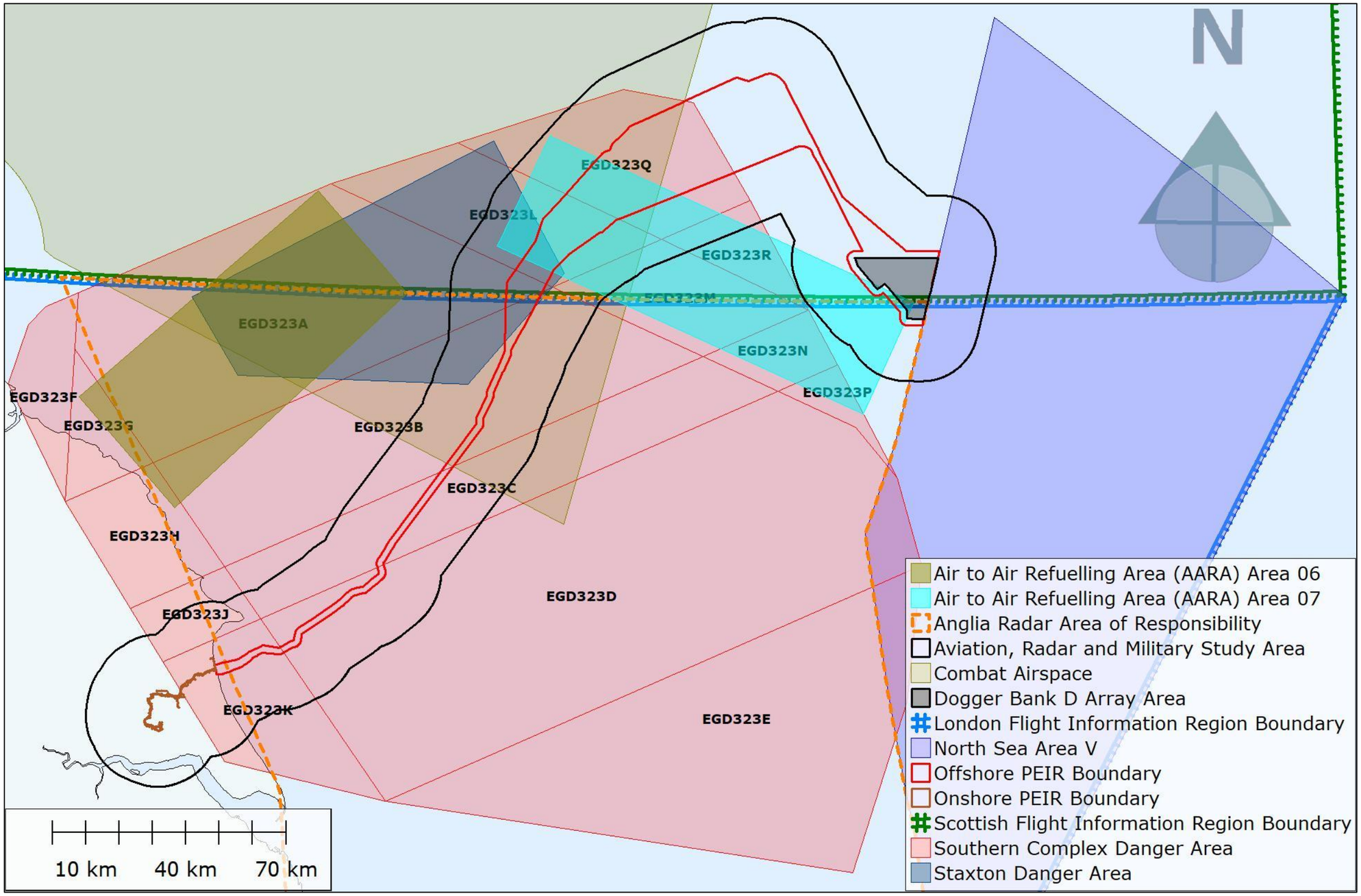
58. Most of the offshore ECC lies beneath the Southern Complex Danger Area EGD323, one of four such complexes in UK airspace that provide segregated airspace for military flying training. Specifically, the offshore ECC lies beneath danger areas EGD323A, B, C, D, K, L and Q (**Figure 16-3**) which have vertical limits of no less than FL50 (approximately 5,000ft amsl) up to FL660 (approximately 66,000ft amsl). Activities within the Southern Complex include high energy manoeuvres, ordnance, munitions and explosives, electrical / optical hazards and unmanned aircraft systems operating beyond visual line of sight.

59. The offshore ECC also lies partially beneath the EGD514 Combat Airspace Danger Area, newly established airspace to support large-scale military training exercises predominantly over the North Sea (**Figure 16-3**). EGD514's vertical limits extend from FL85 (approximately 8,500ft amsl) to FL660 and activities within the airspace include high energy manoeuvres, ordnance, munitions and explosives and electrical / optical hazards.

60. These danger areas are not permanently active, but rather are activated on request and notified by appropriate agencies such as the MOD or CAA through the issue of a NOTAM (Notice to Aviation).

61. The DBD Array Area and offshore ECC partially lie beneath airspace designated as Area 07 (**Figure 16-3**), an Air-to-Air Refuelling Area (AARA) with vertical limits of FL100 (approximately 10,000ft amsl) to FL290 (approximately 29,000ft amsl). Within AARA airspace, fuel is transferred from tanker aircraft to receiver aircraft under a Radar Control Service provided by military controllers based at Swanwick.

Figure 16-3 Existing Airspace Environment



16.6.1.3 Helicopter Operations

62. A network of offshore routes over the Southern North Sea are flown by civilian helicopters in support of oil and gas installations and defined as Helicopter Main Routing Indicators (HMRI). These routes have no lateral dimensions; however, CAP 764 (CAA, 2016) states that planned obstacles within 2nm of the route centreline should be consulted upon with helicopter operators and the Air Navigation Service Provider. The 2nm distance is based upon operational experience, the accuracy of navigation systems, and practicality. Such a distance provides time and space for helicopter pilots to descend safely to an operating altitude below the icing level. There are no existing HMRIs which overlap with or pass within 2nm of the DBD Array Area or offshore ECC. The closest HMRI to the Project is HMRI 9 which is more than 24km (13nm) south-east of the offshore ECC at its nearest point (**Figure 16-4**).

16.6.1.4 Offshore Helidecks

63. To help achieve a safe operating environment, and in compliance with CAP 764 (CAA, 2016), a 9nm (16.7km) consultation zone for planned obstacles exists around offshore helicopter destinations. There are no offshore oil and gas helidecks within 9nm of the DBD Array Area, but the Tolmount helideck is within 9nm of the offshore ECC (**Figure 16-4**).

64. As stated in CAP 764 (CAA, 2016), the 9nm zone does not prohibit development but is a trigger for consultation with offshore helicopter operators, the operators of existing installations and exploration and development locations to determine a solution that maintains safe offshore helicopter operations alongside proposed developments.

16.6.1.5 Search and Rescue

65. There are ten helicopter SAR bases, incorporating 22 aircraft, around the UK with Bristow Helicopters providing helicopters and aircrew. The nearest SAR base is at Humberside Airport, approximately 260km south-west of the DBD Array Area. Its helicopters can provide rescue services up to approximately 460km away from base.

16.6.2 Predicted Future Baseline

66. Although the aviation industry is under long-term pressure to reduce its contribution to climate change, this is not considered to have significant implications for the aviation, radar and military baseline parameters described above. However, an increasing amount of offshore oil and gas infrastructure in the North Sea is being decommissioned which will potentially reduce the volume of helicopter traffic to and from offshore platforms. This may be offset by helicopter traffic associated with new renewable activities, and an increase in low-level autonomous drone traffic can be foreseen.

16.7 Assessment of Effects

67. The likely significant effects to aviation, radar and military receptors that may occur during construction, operation and decommissioning of the Project are assessed in the following sections. The assessment follows the methodology set out in **Section 16.5** and is based on the realistic worst-case scenarios defined in **Section 16.4.4**, with consideration of embedded mitigation measures identified in **Section 16.4.3**

16.7.1 Potential Effects during Construction

16.7.1.1 Creation of an Aviation Obstacle Environment (ARM-C-03)

68. Construction of the wind farm would involve the installation of infrastructure above sea level which could pose a physical obstruction to aircraft utilising the airspace in the vicinity of the DBD Array Area. From a starting point of no infrastructure within the DBD Array Area, the offshore infrastructure outlined in **Table 16-4** would gradually be installed over a construction period of five years.

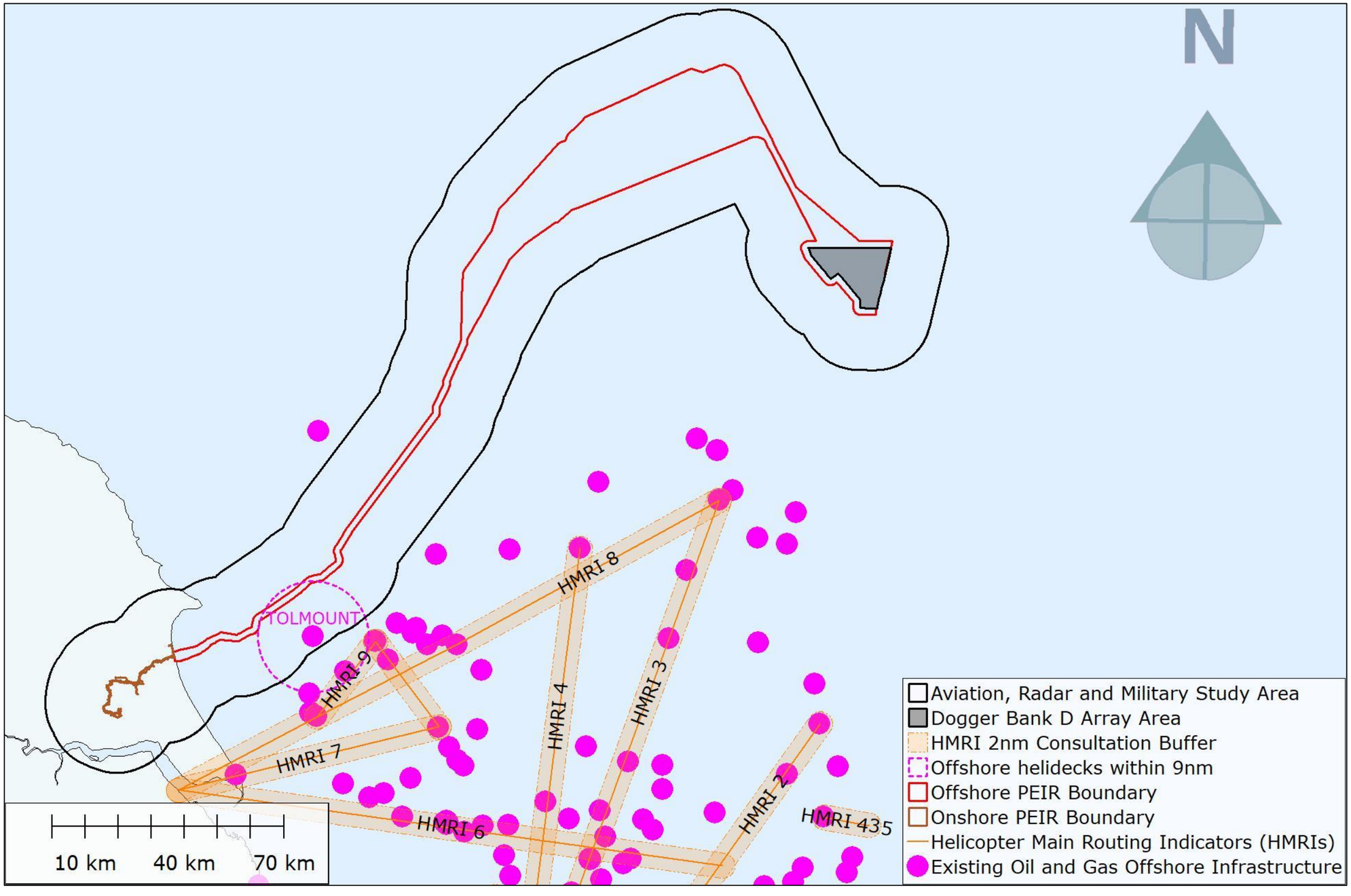
69. Specifically, permanent or temporary obstacles could increase collision risk for:

- General military low flying training and operations; and
- Other low-level fixed-wing or helicopter operations, including those undertaking SAR missions over the Southern North Sea.

70. There are no HMRIs or offshore helidecks in the vicinity of the DBD Array Area. The offshore ECC is within the 9nm consultation zone for the Tolmount offshore helideck; however, there would be no above sea level infrastructure within the offshore ECC and there would be no realistic impact pathway between cable-laying operations and offshore helicopters.

71. Embedded mitigation in the form of information notification and charting (Commitment ID CO8) and marking and lighting (Commitment ID CO9) would make pilots aware of the addition of infrastructure to the DBD Array Area and it is assumed that pilots would comply with aviation regulatory requirements. In consideration of SAR requirements, an ERCoP (Commitment ID CO7) would be developed and implemented for all phases of the Project.

Figure 16-4 Helicopter Main Routing Indicators and Oil and Gas Helidecks



72. The DBD Array Area would occupy uncontrolled (Class G) where the ultimate responsibility for seeing and avoiding obstacles rests with captains of civilian and military aircraft. As outlined in CAA Official Record Series (ORS) 4 No.1496: (UK) Standardised European Rules of the Air – Exceptions to the Minimum Height Requirements (CAA, 2021) aircraft are required to avoid all structures, such as wind turbines, by a minimum distance of 500ft. Military operations are subject to separate rules sponsored by the MOD. Pilots of military aircraft would be required to ensure that a Minimum Separation Distance of 250ft from any person, vessel, vehicle, or structure exists whilst operating in the vicinity of the DBD Array Area. The charting and lighting of the Project should also be taken into account by MOD low flying units and SAR operators.

73. It is assumed that aviation stakeholders would adhere to all relevant CAA and MOD safety guidance in the conduct of their specific operations to ensure safe operations for all users of the airspace above the Project.

16.7.1.1.1 Effect Significance

74. With embedded mitigation and compliance with aviation regulatory requirements, the effect is assessed as **minor**, which is **not significant** in EIA terms.

16.7.1.2 Increased Air Traffic in the Area Related to Wind Farm Activity (ARM-C-04)

75. The use of helicopters to support construction activities for the Project may impact on existing air traffic in the vicinity, potentially increasing the possibility of aircraft collision in the airspace around the Project.

76. The increase in air traffic would be managed by the existing ATS infrastructure, provided in accordance with national procedures, and pilots would be expected to operate in accordance with regulatory requirements. Low-level flights in the vicinity of the DBD Array Area would be conducted under day visual meteorological conditions and pilots would follow the principle of 'see and avoid'.

16.7.1.2.1 Effect Significance

77. Assuming compliance with regulatory requirements and national procedures, the effect is assessed as **minor**, which is **not significant** in EIA terms.

16.7.1.3 Impact of the Offshore Export Cable Route on Staxton Danger Area (ARM-C-05)

78. Cable-laying vessels operating within the offshore ECC during the construction phase could potentially interfere with military exercises within Staxton Danger Area or be endangered by military activities.

79. Staxton Danger Area is not permanently active, but rather is activated on request and notified via NOTAM. An Offshore Cable Installation Plan would be developed (Commitment ID CO24) and engagement with MOD would occur to align activities within Staxton Danger Area and ensure there would be no temporal overlap. Any NOTAMs relating to Staxton Danger Area would be complied with to ensure there would be no vessel presence during military activities.

16.7.1.3.1 Effect Significance

80. With embedded mitigation, MOD engagement (see **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military**)and compliance with NOTAMs, the effect is assessed as **minor**, which is **not significant** in EIA terms.

16.7.1.4 Impacts of Onshore Infrastructure on Airfield Operations (ARM-C-06)

81. Beverley Airfield is an unlicensed aerodrome 7.4km north-east of Beverley in the East Riding of Yorkshire and is the home of Hull Aero Club. The Onshore Development Area crosses the airfield extended runway centreline approximately 70m south-east of the end of the grass runway.

82. Plant equipment and construction activities associated with the excavation of trenches for the onshore export cables could potentially impede flying activities at Beverley Airfield. Digging and exposure of topsoil could attract birds which are a hazard to aircraft.

83. The possible locations for the OCS and associated construction compound would be at least 9.5km south-west of Beverley Airfield. Obstacles at these locations would have no impact on operations at Beverley Airfield.

84. Engagement with the owner of Beverley Airfield would be necessary to ensure that the airfield is made aware of construction activities that could potentially affect operations at the airfield and hence determine the locations within the Onshore Development Area that would be of concern. Coordination of construction activities with the airfield would enable the airfield to raise awareness of potential obstacle hazards for visiting pilots.

16.7.1.4.1 Effect Significance

85. With suitable coordination of construction activities with Beverley Airfield so that pilots are made aware of potential obstacle hazards, the effect is assessed as **minor**, which is **not significant** in EIA terms.

16.7.2 Potential Effects during Operation

16.7.2.1 Creation of an Aviation Obstacle Environment (ARM-O-03)

86. During the operation and maintenance phase of the Project the infrastructure outlined in **Table 16-4** would be present within the DBD Array Area. This could pose a physical obstruction to aircraft utilising the airspace in the vicinity of the Project.

87. Specifically, permanent obstacles could increase collision risk for:

- General military low flying training and operations; and
- Other low-level fixed-wing or helicopter operations, including those undertaking SAR missions over the Southern North Sea.

88. There are no HMRIs or offshore helidecks in the vicinity of the DBD Array Area. The offshore ECC is within the 9nm consultation zone for the Tolmount offshore helideck; however, there would be no above sea level infrastructure within the offshore ECC.

89. Embedded mitigation in the form of information notification and charting (Commitment ID CO8) and marking and lighting (Commitment ID CO9) would make pilots aware of the addition of infrastructure to the DBD Array Area and it is assumed that pilots would comply with aviation regulatory requirements. In consideration of SAR requirements, an ERCoP (Commitment ID CO7) would be developed and implemented for all phases of the Project.

90. It is assumed that aviation stakeholders would adhere to all relevant CAA and MOD safety guidance in the conduct of their specific operations to ensure safe operations for all users of the airspace above the Project.

16.7.2.1.1 Effect Significance

91. With embedded mitigation and compliance with aviation regulatory requirements, the effect is assessed as **minor**, which is **not significant** in EIA terms.

16.7.2.2 Increased Air Traffic in the Area Related to Wind Farm Activity (ARM-O-04)

92. The operation and maintenance phase of the Project would likely see a small increase in helicopter traffic above the current baseline level engaged in support operations in the area. The possible increase in air traffic brings with it a potential increased possibility of aircraft collision.

93. The increase in air traffic would be managed by the existing ATS infrastructure, provided in accordance with national procedures, and pilots would be expected to operate in accordance with regulatory requirements. Low-level flights in the vicinity of the DBD Array Area would be conducted under day visual meteorological conditions and pilots would follow the principle of 'see and avoid'.

16.7.2.2.1 Effect Significance

94. Assuming compliance with regulatory requirements and national procedures, the effect is assessed as **minor**, which is **not significant** in EIA terms.

16.7.2.3 Impact of the Offshore Export Cable Route on Staxton Danger Area (ARM-O-05)

95. Cable-laying and support vessels engaged in offshore export cable maintenance activities within the offshore ECC could potentially interfere with military exercises within Staxton Danger Area or be endangered by military activities.

96. Staxton Danger Area is not permanently active, but rather is activated on request and notified via NOTAM. Engagement with MOD would occur to align activities within Staxton Danger Area and ensure there would be no temporal overlap. Any NOTAMs relating to Staxton Danger Area would be complied with to ensure there would be no vessel presence during military activities.

16.7.2.3.1 Effect Significance

97. With MOD engagement and compliance with NOTAMs, the effect is assessed as **minor**, which is **not significant** in EIA terms.

16.7.2.4 Impact of Onshore Infrastructure on Airfield Operations (ARM-O-06)

98. The OCS infrastructure would include buildings of up to 25m in height and 30m high lighting protection towers. Other non-OCS onshore infrastructure such as onshore export cables would be buried below the surface.

99. The possible locations for the OCS and associated above surface infrastructure would be at least 9.5km south-west of Beverley Airfield. Obstacles at these locations would have no impact on operations at Beverley Airfield.

16.7.2.4.1 Effect Significance

100. The OCS location would be beyond the range at which obstacles could have an impact on Beverley Airfield operations; therefore the effect is assessed as **negligible**, which is **not significant** in EIA terms.

16.7.3 Potential Effects during Decommissioning

101. No decision has been made regarding the final decommissioning strategy for the offshore infrastructure, as it is recognised that regulatory requirements and industry best practice change over time.

102. Commitment ID CO21 (see **Table 16-3**) requires an Offshore Decommissioning Plan to be prepared and agreed with the relevant authorities prior to the commencement of offshore decommissioning works. This will ensure that decommissioning aviation, radar and military impacts will be assessed in accordance with the applicable regulations and guidance at that time of decommissioning where relevant, with appropriate mitigation implemented as necessary to avoid significant effects.

103. The detailed activities and methodology for decommissioning will be determined later within the Project's lifetime, but would be expected to include:

- Removal of all the wind turbine components and part of the foundations (those above seabed level);
- Removal of some or all of the array and export cables; and
- The inter-array and offshore export cables will likely be cut at the cable ends and left in-situ below the seabed, and scour and cable protection would likely be left in-situ other than where there is a specific condition for its removal.

104. Whilst a detailed assessment of decommissioning impacts cannot be undertaken at this stage, for this assessment, it is assumed that decommissioning is likely to operate within the parameters identified for construction (i.e. any activities are likely to occur within the temporary construction working areas and require no greater amount or duration of activity than assessed for construction). The decommissioning sequence will generally be the reverse of the construction sequence. It is therefore assumed that decommissioning impacts would likely be of similar nature to, and no worse than, those identified during the construction phase.

105. The magnitude of decommissioning effects will be comparable to, or less than, those as assessed during the construction and operation and maintenance phase. Accordingly, aviation, radar and military receptors during the construction and operation and maintenance phases, it is anticipated that the same would be valid for the decommissioning phase regardless of the final decommissioning methodologies. Therefore, all would be considered as **not significant** in EIA terms.

16.8 Cumulative Effects

106. Cumulative effects are the result of the impacts of the Project acting in combination with the impacts of other proposed and reasonably foreseeable developments on receptors. This includes plans and projects that are not inherently considered as part of the current baseline.

107. The overarching framework used to identify and assess cumulative effects is set out in **Chapter 6 Environmental Impact Assessment Methodology**. The four-stage approach is based upon the Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment (PINS, 2017) and the Offshore Wind Marine Environmental Assessments: Best Practice Advance for Evidence and Data Standards (Parker *et al.*, 2022)]. The fourth stage of the process is the assessment stage, which is detailed within the sections below for potential cumulative effects on aviation, radar and military receptors.

16.8.1 Screening for Potential Cumulative Effects

108. The first step of the CEA identifies which impacts associated with the Project alone, as assessed under **Section 16.7**, have the potential to interact with other plans and projects to give rise to cumulative effects. All potential cumulative effects to be taken forward in the CEA are detailed in **Table 16-7** with a rationale for screening in or out. Only impacts determined to have a residual effect of negligible or greater are included in the CEA. Those assessed as 'no impact' are excluded, as there is no potential for them to contribute to a cumulative effect.

16.8.2 Screening for Other Plans/Projects

109. The second step of the CEA identifies a short-list of other plans and projects that have the potential to interact with the Project to give rise to significant cumulative effects during the construction and operation and maintenance phases. The short-list provided in **Table 16-8** has been produced specifically to assess cumulative effects on aviation, radar and military receptors. The exhaustive list of all offshore plans and projects considered in the development of the Project's CEA framework is provided in **Volume 2, Appendix 6.2 Offshore Cumulative Effects**.

110. Developments that were fully operational during baseline characterisation, including at the time of site-specific surveys, are considered as part of baseline conditions for the surrounding environment. It is assumed that any residual effects associated with these developments are captured within the baseline information. As such, these developments are not subject to further assessment within the CEA and excluded from the screening exercise presented in **Table 16-8**.

Table 16-7 Aviation, Radar and Military – Potential Cumulative Effects

Impact ID	Impact and Project Activity	Potential for Cumulative Effects	Rationale
Construction			
ARM-C-03	Creation of an aviation obstacle environment – installation of above sea level infrastructure.	Yes	Wind turbines and high crane installation vessels associated with other developments create obstacles, restricting the available airspace.
ARM-C-04	Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	Yes	Air traffic activities associated with other developments have the potential to cumulatively increase the risk of aircraft collision.
ARM-C-05	Impact of the offshore export cable route on Staxton Danger Area – installation of the offshore export cable.	Yes	Cable-laying vessels associated with other offshore developments could cumulatively interfere with Staxton Danger Area military activities.
ARM-C-06	Impacts of onshore infrastructure on airfield operations – installation of the onshore export cables and construction of onshore infrastructure.	Yes	Other developments in the vicinity of Beverley Airfield could impede flying activities.
Operation & Maintenance			
ARM-O-03	Creation of an aviation obstacle environment – presence of wind turbines and offshore substation platforms.	Yes	Wind turbines associated with other developments create obstacles, restricting the available airspace.
ARM-O-04	Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	Yes	Air traffic activities associated with other developments have the potential to cumulatively increase the risk of aircraft collision.
ARM-O-05	Impact of the offshore export cable route on Staxton Danger Area – offshore export cable repair or replacement activities.	Yes	Vessels associated with other offshore developments could cumulatively interfere with Staxton Danger Area military activities.
ARM-O-06	Impacts of onshore infrastructure on airfield operations – presence of onshore infrastructure.	Yes	Other developments in the vicinity of Beverley Airfield could impede flying activities.
Decommissioning			
ARM-D-03	Creation of an aviation obstacle environment – decommissioning activities not yet defined.	No	See rationale for equivalent Construction impact.
ARM-D-04	Increased air traffic in the area related to wind farm activity – decommissioning activities not yet defined.	Yes	
ARM-D-05	Impact of the offshore export cable route on Staxton Danger Area – decommissioning activities not yet defined.	Yes	
ARM-D-06	Impact of onshore infrastructure on airfield operations – decommissioning activities not yet defined.	Yes	

Table 16-8 Short List of Plans / Projects for the Aviation, Radar and Military Cumulative Effects Assessment

Project / Plan	Development Type	Status	Tier	Construction / Operation Period	Closest Distance to Array Area (km)	Closest Distance to Offshore ECC (km)	Potential for Significant Cumulative Effects	Rationale
Dogger Bank C Offshore Windfarm	Offshore Wind Farm	Under construction	2	Construction: 2024 to 2026 Operation: 2027 to 2035+	0.00	3.07	Yes	Proximity to the Project and potential for cumulative effects in terms of physical obstructions to low flying aircraft and increased air traffic increasing the possibility of aircraft collision.
Sofia Offshore Wind Farm (EN010051)	Offshore Wind Farm	Under construction	2	Construction: 2024 to 2026 Operation: 2027 to 2035+	17.75	22.79	Yes	Proximity to the Project and potential for cumulative effects in terms of physical obstructions to low flying aircraft and increased air traffic increasing the possibility of aircraft collision.

111. For developments that were not fully operational, including those in planning / pre-construction stages or under construction, during baseline characterisation and operational developments with potential for ongoing impacts, these are included in the screening exercise presented in **Table 16-8**.

112. The screening exercise has been undertaken based on available information on each plan or project as of 31st December 2024. Information has been obtained from The Crown Estate and 4C Offshore's online Global Offshore Renewable Map. It is noted that further information regarding the identified plans and projects may become available between PEIR publication and DCO application submission or may not be available in detail prior to construction. The assessment presented here is therefore considered to be conservative at the time of PEIR publication. The list of plans and projects will be updated at ES stage to incorporate more recent information at the time of writing. Plans and projects identified in **Table 16-8** have been assigned a tier based on their development status, the level of information available to inform the CEA and the degree of confidence. A seven tier system based on the guidance issued by Natural England and the Department of Environmental, Food and Rural Affairs (Defra) has been adopted (Parker *et al.*, 2022).

113. The zone of influence (ZoI) used to identify relevant plans and projects for the aviation, radar and military CEA is a search distance of 40km from the DBD Array Area including a 1km construction buffer zone. This is considered a maximum range for other offshore infrastructure to have a potential for creating a cumulative aviation obstacle environment for aircraft and restricting available airspace. Radar impacts are scoped out and will therefore not be considered for the CEA.

114. Each plan or project in **Table 16-8** has been considered on a case-by-case basis. Only plans and projects with potential for significant cumulative effects with the Project are taken forward to a detailed assessment, which are screened based on the following criteria:

- There is potential that a pathway exists whereby an impact could have a cumulative effect on a receptor;
- The impact on a receptor from the Project and the plan or project in consideration has a spatial overlap (i.e. occurring over the same area);
- The impact on a receptor from the Project and the plan or project in consideration has a temporal overlap (e.g. occurring at the same time);
- There is sufficient information available on the plan or project in consideration and moderate to high data confidence to undertake a meaningful assessment; and
- There is some likelihood that the residual effect (i.e. after accounting for mitigation measures) of the Project could result in significant cumulative effects with the plan or project in consideration.

115. The CEA for aviation, radar and military (see **Table 16-8**) has identified a total of two plans and projects where significant cumulative effects could arise in combination with the Project. A detailed assessment of cumulative effects is provided in the section below.

16.8.3 Assessment of Cumulative Effects

16.8.3.1 Cumulative Impact 1: Creation of an Aviation Obstacle Environment (ARM-C-03)

116. Construction of the Project would involve the installation of infrastructure above sea level which could pose a physical obstruction to military low flying aircraft and helicopters engaged in SAR missions. There is potential for cumulative effects when also considering the infrastructure associated with the Dogger Bank C and Sofia offshore wind farms.

117. Embedded mitigation in the form of information notification and charting (Commitment ID CO8) and marking and lighting (Commitment ID CO9) would make pilots aware of the addition of infrastructure to the DBD Array Area and it is assumed that pilots would comply with aviation regulatory requirements. In consideration of SAR requirements, an ERCoP (Commitment ID CO7) would be developed and implemented for all phases of the Project.

118. The same embedded mitigations would also apply to other offshore wind farm developments in the vicinity of the DBD Array Area.

16.8.3.1.1 Cumulative Effect Significance

119. With embedded mitigation and compliance with aviation regulatory requirements, the cumulative effect is assessed as **minor**, which is **not significant** in EIA terms.

16.8.3.2 Cumulative Impact 2: Increased Air Traffic in the Area Related to Wind Farm Activity (ARM-C-04)

120. During the construction phase of the Project there would likely be an increase in helicopter air traffic above the current baseline levels due to the use of helicopters to support construction activities. The cumulative effect of this activity and similar activities associated with the Dogger Bank C and Sofia offshore wind farms would create an increased possibility of aircraft collision.

121. The increase in air traffic would be managed by the existing ATS infrastructure, provided in accordance with national procedures, and pilots would be expected to operate in accordance with regulatory requirements. Low-level flights in the vicinity of the DBD Array Area would be conducted under day visual meteorological conditions and pilots would follow the principle of 'see and avoid'.

16.8.3.2.1 Cumulative Effect Significance

122. Assuming compliance with regulatory requirements and national procedures, the cumulative effect is assessed as **minor**, which is **not significant** in EIA terms.

16.8.3.3 Cumulative Impact 3: Impact of the offshore export cable route on Staxton Danger Area activities (ARM-C-05)

123. There is no spatial overlap of the Dogger Bank C and Sofia offshore wind farms with the Staxton Danger Area activities. Therefore no cumulative effect has been screened in for this impact.

16.8.3.4 Cumulative Impact 4: Impacts of onshore infrastructure on airfield operations (ARM-C-06)

124. There is no spatial overlap of the Dogger Bank C and Sofia offshore wind farms with the Beverley Airfield. Therefore no cumulative effect has been screened in for this impact.

16.8.3.5 Cumulative Impact 5: Creation of an Aviation Obstacle Environment (ARM-O-03)

125. The Project infrastructure above sea level during the operation and maintenance phase could pose a physical obstruction to military low flying aircraft and helicopters engaged in SAR missions. There is potential for cumulative effects when also considering the infrastructure associated with the Dogger Bank C and Sofia offshore wind farms.

126. Embedded mitigation in the form of information notification and charting (Commitment ID CO8) and marking and lighting (Commitment ID CO9) would make pilots aware of the addition of infrastructure to the DBD Array Area and it is assumed that pilots would comply with aviation regulatory requirements. In consideration of SAR requirements, an ERCoP (Commitment ID CO7) would be developed and implemented for all phases of the Project.

127. The same embedded mitigations would also apply to other offshore wind farm developments in the vicinity of the DBD Array Area.

16.8.3.5.1 Cumulative Effect Significance

128. With embedded mitigation and compliance with aviation regulatory requirements, the cumulative effect is assessed as **minor**, which is **not significant** in EIA terms.

16.8.3.6 Cumulative Impact 6: Increased Air Traffic in the Area Related to Wind Farm Activity (ARM-O-04)

129. During the operation and maintenance phase of the Project there would likely be a small increase in helicopter air traffic above the current baseline levels due to the use of helicopters to support operation and maintenance activities. The cumulative effect of this activity and similar activities associated with the Dogger Bank C and Sofia offshore wind farms would create an increased possibility of aircraft collision.

130. The increase in air traffic would be managed by the existing ATS infrastructure, provided in accordance with national procedures, and pilots would be expected to operate in accordance with regulatory requirements. Low-level flights in the vicinity of the DBD Array Area would be conducted under day visual meteorological conditions and pilots would follow the principle of ‘see and avoid’.

16.8.3.6.1 Cumulative Effect Significance

131. Assuming compliance with regulatory requirements and national procedures, the cumulative effect is assessed as **minor**, which is **not significant** in EIA terms.

16.8.3.7 Cumulative Impact 07: Impact of the offshore export cable route on Staxton Danger Area activities (ARM-O-05)

132. There is no spatial overlap of the Dogger Bank C and Sofia offshore wind farms with the Staxton Danger Area activities. Therefore no cumulative effect has been screened in for this impact.

16.8.3.8 Cumulative Impact 08: Impacts of onshore infrastructure on airfield operations (ARM-O-06)

There is no spatial overlap of the Dogger Bank C and Sofia offshore wind farms with the Beverley Airfield. Therefore no cumulative effect has been screened in for this impact.

16.8.3.9 Cumulative Impact 9: Increased Air Traffic in the Area Related to Wind Farm Activity (ARM-D-04)

133. During the decommissioning phase of the Project there would likely be an increase in helicopter air traffic above the current baseline levels due to the use of helicopters to support decommissioning activities. The cumulative effect of this activity and similar activities associated with the Dogger Bank C and Sofia offshore wind farms would create an increased possibility of aircraft collision.

134. The increase in air traffic would be managed by the existing ATS infrastructure, provided in accordance with national procedures, and pilots would be expected to operate in accordance with regulatory requirements. Low-level flights in the vicinity of the DBD Array Area would be conducted under day visual meteorological conditions and pilots would follow the principle of ‘see and avoid’.

16.8.3.9.1 Cumulative Effect Significance

135. Assuming compliance with regulatory requirements and national procedures, the cumulative effect is assessed as **minor**, which is **not significant** in EIA terms.

16.8.3.10 Cumulative Impact 10: Impact of the offshore export cable route on Staxton Danger Area activities (ARM-D-05)

136. There is no spatial overlap of the Dogger Bank C and Sofia offshore wind farms with the Staxton Danger Area activities. Therefore no cumulative effect has been screened in for this impact.

16.8.3.11 Cumulative Impact 11: Impacts of onshore infrastructure on airfield operations (ARM-D-06)

137. There is no spatial overlap of the Dogger Bank C and Sofia offshore wind farms with the Beverley Airfield. Therefore no cumulative effect has been screened in for this impact.

16.9 Transboundary Effects

138. The DBD Array Area would be entirely within UK FIR airspace and 109km from the nearest international FIR boundary; however, the eastern boundary of the DBD Array Area lies along the western boundary of airspace known as North Sea Area V, and this airspace is delegated to the Netherlands.

139. The potential effects from the creation of an aviation obstacle environment would be localised to the DBD Array Area, and air traffic associated with the Project would be within UK airspace and subject to UK air traffic regulations. Wind turbines within the DBD Array Area would be significantly beyond the operational range of any non-UK radars, therefore there would be no transboundary radar effects.

140. CAP 764 (CAA, 2016) advises that wind turbine developers should contact the CAA for specific guidance where developments are likely to approach the limits of the UK FIR. Due to the proximity of the Project with Netherlands airspace CAA guidance will be sought and the outcome used to inform the Environmental Statement.

16.10 Inter-Relationships and Effect Interactions

16.10.1 Inter-Relationships

141. Inter-relationships are defined as effects arising from residual effects associated with different environmental topics acting together upon a single receptor or receptor group. Potential inter-relationships between aviation, radar and military and other environmental topics have been considered, where relevant, within the PEIR. **Table 16-9** provides a summary of key inter-relationships and signposts to where they have been addressed in the relevant chapters.

Table 16-9 Aviation, Radar and Military – Inter-Relationships with Other Topics

Impact ID	Impact and Project Activity	Related EIA Topic	Where Assessed in the PEIR Chapter	Rationale
Construction				
ARM-C-03	Creation of an aviation obstacle environment – installation of above sea level infrastructure.	Chapter 15 Shipping and Navigation Chapter 13 Offshore and Intertidal Ornithology	Marking and lighting will be in accordance with both aviation and maritime requirements as stated in **Table 16-3**.	Aviation lighting could be mistaken for maritime lighting. Aviation lighting could attract birds.
Operation & Maintenance				
ARM-O-03	Creation of an aviation obstacle environment – presence of wind turbines and offshore substation platforms.	Chapter 15 Shipping and Navigation Chapter 13 Offshore and Intertidal Ornithology	Marking and lighting will be in accordance with both aviation and maritime requirements as stated in **Table 16-3**.	Aviation lighting could be mistaken for maritime lighting. Aviation lighting could attract birds.
Decommissioning				
The details and scope of offshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Onshore Decommissioning Programme (see **Table 16-3**, Commitment ID CO21). For this assessment, it is assumed that inter-relationships during the decommissioning phase would be of similar nature to those identified during the construction phase.				

16.10.2 Interactions

142. The impacts identified and assessed in this chapter have the potential to interact with each other. Potential interactions between impacts are identified in **Table 16-10**. Where there is potential for interaction between impacts, these are assessed in **Table 16-11** for each receptor or receptor group.

143. Interactions are assessed by development phase ("phase assessment") to see if multiple impacts could increase the overall effect significance experienced by a single receptor or receptor group during each phase. Following from this, a lifetime assessment is undertaken which considers the potential for multiple impacts to accumulate across the construction, operation and decommissioning phases and result in a greater effect on a single receptor or receptor group. When considering synergistic effects from interactions, it is assumed that the receptor sensitivity remains consistent, while the magnitude of different impacts is additive.

Table 16-10 Aviation, Radar and Military – Potential Interactions between Impacts

Construction and Operation & Maintenance

	ARM-C-03	ARM-C-04	ARM-C-05	ARM-C-06	ARM-O-03	ARM-O-04	ARM-O-05	ARM-O-06
ARM-C-03		Yes	No	No	No	No	No	No
ARM-C-04	Yes		No	No	No	No	No	No
ARM-C-05	No	No		No	No	No	No	No
ARM-C-06	No	No	No		No	No	No	No
ARM-O-03	No	No	No	No		Yes	No	No
ARM-O-04	Yes	No	No	No	Yes		No	No
ARM-O-05	No	No	No	No	No	No		No
ARM-O-06	No	No	No	No	No	No	No	

Decommissioning

The details and scope of offshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Offshore Decommissioning Plan (see **Table 16-3**, Commitment ID CO21).

For this assessment, it is assumed that interactions during the decommissioning phase would be of similar nature to, and no worse than, those identified during the construction phase.

Table 16-11 Interaction Assessment – Phase and Lifetime Effects

Impact ID	Impact and Project Activity	Receptor	Highest Significance Level			Phase Assessment	Lifetime Assessment
			Construction	Operation & Maintenance	Decommissioning		
ARM-C-03 ARM-C-04	Creation of an aviation obstacle environment – installation of above sea level infrastructure. Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	Military low flying aircraft Other offshore fixed-wing and helicopter operations, including SAR Helicopters supporting construction activities	Minor	Minor	Minor	Construction: No greater than individually assessed impact. There is potential interaction between impacts identified in the construction phase, however all potential effects are not significant and are localized in nature. Embedded mitigation measures, the existing ATS infrastructure, and pilot compliance with regulatory requirements would reduce the potential for interaction of impacts, therefore it is anticipated that the combined effect on airspace users would not be of greater significance than when the effects are assessed in isolation.	No greater than individually assessed impact. All potential effects are not significant and are localized in nature, limiting the potential for different impacts to interact across the Project phases.
ARM-O-03 ARM-O-04	Creation of an aviation obstacle environment – presence of wind turbines and offshore substation platforms. Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	Military low flying aircraft Other offshore fixed-wing and helicopter operations, including SAR Helicopters supporting operation and maintenance activities	Minor	Minor	Minor	Operation & Maintenance: No greater than individually assessed impact. There is potential interaction between impacts identified in the operation and maintenance phase, however all potential effects are not significant and are localized in nature. Embedded mitigation measures, the existing ATS infrastructure, and pilot compliance with regulatory requirements would reduce the potential for interaction of impacts, therefore it is anticipated that the combined effect on airspace users would not be of greater significance than when the effects are assessed in isolation.	No greater than individually assessed impact. All potential effects are not significant and are localized in nature, limiting the potential for different impacts to interact across the Project phases.
ARM-D-03 ARM-D-04	Creation of an aviation obstacle environment – removal of above sea level infrastructure. Increased air traffic in the area related to wind farm activity – decommissioning activities not yet defined.	Military low flying aircraft Other offshore fixed-wing and helicopter operations, including SAR Helicopters supporting decommissioning activities	Minor	Minor	Minor	Decommissioning: No greater than individually assessed impact. There is potential interaction between impacts identified in the decommissioning phase, however all potential effects are not significant and are localized in nature. Embedded mitigation measures, the existing ATS infrastructure, and pilot compliance with regulatory requirements would reduce the potential for interaction of impacts, therefore it is anticipated that the combined effect on airspace users would not be of greater significance than when the effects are assessed in isolation.	No greater than individually assessed impact. All potential effects are not significant and are localized in nature, limiting the potential for different impacts to interact across the Project phases.

16.11 Monitoring Measures

144. No monitoring measures have been proposed for aviation, radar and military.

16.12 Summary

145. **Table 16-12** presents a summary of the preliminary results of the assessment of likely significant effects on aviation, radar and military during the construction, operation and decommissioning of the Project.

16.13 Next Steps

146. For the ES stage, data sources accessed when defining the baseline will be reviewed to capture any updates. Further stakeholder engagement will be undertaken with the MOD regarding potential impacts on Staxton Danger Area and the Southern Complex Danger Area progresses (see **Volume 2, Appendix 16.1 Consultation Responses for Aviation, Radar and Military**). Stakeholder engagement with Beverley Airfield and the operators of the Tolmount offshore helideck will be carried out following the PEIR submission and prior to ES submission. Guidance from the UK CAA and Netherlands CAA will be sought regarding potential transboundary effects following the PEIR submission and prior to ES submission. Refinements to the assessments undertaken will be made as necessary following consultation with these relevant aviation stakeholders.

Table 16-12 Summary of Potential Effects Assessed for Aviation, Radar and Military

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
Construction								
ARM-C-03	Creation of an aviation obstacle environment – installation of above sea level infrastructure.	CO7 CO8 CO9	Military low flying aircraft Other offshore fixed-wing and helicopter operations, including SAR Helicopters supporting construction activities	N/A	Minor	N/A.	Minor	Not required.
ARM-C-04	Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	N/A	Military low flying aircraft Other offshore fixed-wing and helicopter operations, including SAR Helicopters supporting construction activities	N/A	Minor	N/A.	Minor	Not required.
ARM-C-05	Impact of the offshore export cable route on Staxton Danger Area activities – installation of the offshore export cable.	CO24	Cable-laying vessels Military danger area activities	N/A	Minor	N/A.	Minor	Not required.
ARM-C-06	Impacts of onshore infrastructure on airfield operations – installation of the onshore export cables and construction of onshore infrastructure.	N/A	Flying activities at Beverley Airfield	N/A	Minor	N/A.	Minor	Not required.
Operation & Maintenance								
ARM-O-03	Creation of an aviation obstacle environment – presence of wind turbines and offshore substation platforms.	CO7 CO8 CO9	Military low flying aircraft Other offshore fixed-wing and helicopter operations, including SAR Helicopters supporting operation and maintenance activities	N/A	Minor	N/A.	Minor	Not required.
ARM-O-04	Increased air traffic in the area related to wind farm activity – helicopter traffic engaged in works on the Project.	CO28	Military low flying aircraft Other offshore fixed-wing and helicopter operations, including SAR Helicopters supporting operation and maintenance activities	N/A	Minor	N/A.	Minor	Not required.

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
ARM-O-05	Impact of the offshore export cable route on Staxton Danger Area activities – offshore export cable repair or replacement activities.	N/A	Cable-laying vessels Military danger area activities	N/A	Minor	N/A.	Minor	Not required.
ARM-O-06	Impacts of onshore infrastructure on airfield operations – presence of onshore infrastructure.	N/A	Flying activities at Beverley Airfield	N/A	Negligible	N/A.	Negligible	Not required.

Decommissioning

The details and scope of offshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Offshore Decommissioning Plan (see Commitment ID CO21 in **Volume 2, Appendix 6.3 Commitments Register**). This will include a detailed assessment of decommissioning impacts and appropriate mitigation measures to avoid significant effects.

For this assessment, it is assumed that impacts during the decommissioning phase would be of similar nature to, and no worse than, those identified during the construction phase.

References

CAA (2022a). Air Navigation Order 2016/765. Available at: https://www.caa.co.uk/uk-regulations/aviation-safety/civil-aviation-act-1982-the-ano-2016-the-rules-of-the-air-2015-and-the-dg-regulations-2002/the-civil-aviation-air-navigation-order-2016/. [Accessed: 18/10/2024.]

CAA (2024). CAP 032: UK Aeronautical Information Publication. Available at: https://nats-uk.ead-it.com/cms-nats/opencms/en/Publications/AIP/. [Accessed: 18/10/2024.]

CAA (2022b). CAP 168: Licensing of Aerodromes. Available at: https://www.caa.co.uk/our-work/publications/documents/content/cap-168/. [Accessed: 18/10/2024.]

CAA (2023). CAP 437: Standards for Offshore Helicopter Landing Areas. Available at: https://www.caa.co.uk/our-work/publications/documents/content/cap-437/. [Accessed: 18/10/2024.]

CAA (2019). CAP 670: Air Traffic Services Safety Requirements. Available at: https://www.caa.co.uk/our-work/publications/documents/content/cap-670/. [Accessed: 18/10/2024.]

CAA (2016). CAP 764: Policy and Guidelines on Wind Turbines. Available at: https://www.caa.co.uk/our-work/publications/documents/content/cap-764/. [Accessed: 18/10/2024.]

CAA (2010). CAP 793: Safe Operating Practices at Unlicensed Aerodromes. Available at: https://www.caa.co.uk/our-work/publications/documents/content/cap-793/. [Accessed: 18/10/2024.]

CAA (2021). ORS 4 No.1496: (UK) Standardised European Rules of the Air – Exceptions to the Minimum Height Requirements. Available at: https://www.caa.co.uk/our-work/publications/documents/content/ors4-no-1496/. [Accessed: 18/10/2024.]

DESNZ (2023a). Overarching NPS for Energy (EN-1). Available at: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1. [Accessed: 18/10/2024.]

DESNZ (2023b). NPS for Renewable Energy Infrastructure (EN-3). Available at: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3. [Accessed: 18/10/2024.]

ICAO (2022). Annex 14 Aerodromes: Volume 1 Aerodrome Design and Operations. Available at: https://store.icao.int/en/annex-14-aerodromes. [Accessed: 18/10/2024.]

ICAO (2015). ICAO EUR DOC 015: European Guidance Material on Managing Building Restricted Areas. Available at: https://www.icao.int/EURNAT/EUR%20and%20NAT%20Documents/EUR%20Documents/EUR%20Documents/015%20-%20Building%20Restricted%20Areas/ICAO%20EUR%20Doc%20015%20Third%20Edition%20Nov2015.pdf. [Accessed: 18/10/2024.]

MCA (2021). MGN 654: Safety of Navigation: OREIs – Guidance on UK Navigational Practice, Safety and Emergency Response. Available at: https://www.gov.uk/government/publications/mgn-654-mf-offshore-renewable-energy-installations-orei-safety-response. [Accessed: 18/10/2024.]

MCA (2024). Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for SAR and Emergency Response. Available at: https://assets.publishing.service.gov.uk/media/65a695fc640602000d3cb75d/OREI-SAR-Requirements-v4-.pdf. [Accessed: 18/10/2024.]

MOD (2024). UK Military Aeronautical Information Publication. Available at: https://www.aidu.mod.uk/aip/. [Accessed: 18/10/2024.]

MOD (2020). MOD Obstruction Lighting Guidance. Available at: https://www.contarnex.com/infrared-obstruction-lighting/MOD%20Obstruction%20Lighting%20Guidance%202020.pdf. [Accessed: 18/10/2024.]

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List of Acronyms

Acronym	Definition
AARA	Air-to-Air Refuelling Area
AD	Air Defence
AIP	Aeronautical Information Publication
amsl	above mean sea level
ANO	Air Navigation Order
ATC	Air Traffic Control
ATS	Air Traffic Services
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CEA	Cumulative Effects Assessment
CNS	Communication, Navigation and Surveillance
DBD	Dogger Bank D Offshore Wind Farm
DCO	Development Consent Order
Defra	Department of Environmental, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DME	Distance Measuring Equipment
dML	Deemed Marine Licence
ECC	Export Cable Corridor
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ERCoP	Emergency Response and Cooperation Plan
ES	Environmental Statement
FIR	Flight Information Region
FL	Flight Level
HAT	Highest Astronomical Tide
HMRI	Helicopter Main Routing Indicator
ICAO	International Civil Aviation Organisation
LAT	Lowest Astronomical Tide
MCA	Maritime and Coastguard Agency
MGN	Marine Guidance Note
MOD	Ministry of Defence
NERL	NATS (En-Route) plc
nm	nautical miles
NOTAM	Notice to Aviation
NSIP	Nationally Significant Infrastructure Project
NPS	National Policy Statement
NSL	NATS (Services) Limited
NSTA	North Sea Transition Authority
O&M	Operation and Maintenance
OCS	Onshore Converter Station
Ofcom	Office of Communications
OREI	Offshore Renewable Energy Installation
ORS	Official Record Series
OSP	Offshore Substation Platform
PEIR	Preliminary Environmental Impact Report
PSR	Primary Surveillance Radar

Acronym	Definition
RLoS	Radar Line of Sight
SAR	Search and Rescue
UK	United Kingdom
VHF	Very High Frequency
VOR	VHF Omni Directional Range
ZoI	Zone of Influence