Cerulean Winds Aspen Project Limited

Aspen Offshore Wind Farm

Offshore Environmental Impact Assessment Report

Volume 2, Chapter 15: Military and Civil Aviation

August 2025

COMMERCIAL IN CONFIDENCE

Revision	Date	Status	Author:	Checked by:	Approved by:
01	August 2025	Final	Cyrrus Ltd.	GoBe Consultants Ltd.	Cerulean Winds (UKCS) Ltd.

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Defined Terms

Term	Definition
Applicant	Cerulean Winds Aspen Project Limited.
Aspen Array Area	The area in which the generation infrastructure for Aspen Offshore Wind Farm (OWF), including Wind Turbine Generators (WTGs) and Offshore Substation Platforms (OSPs) will be located.
Controlled Airspace	Defined airspace within which pilots must follow Air Traffic Control instructions. In the UK, Classes A, C, D and E are areas of controlled airspace.
Cumulative Effects	The combined effect of the Proposed Development in combination with the effects from a number of different projects, on the same single receptor/resource.
Cumulative Effects Assessment (CEA)	A CEA is a quantification and evaluation of potential effects by taking into consideration any other plans or projects proposed or existing, and where sufficient information is available, which, together with the Proposed Development have a likely significant effect on a receptor due to a common impact pathway and/or temporal or spatial overlap.
Cumulative Impacts	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with the Proposed Development.
Environmental Impact Assessment (EIA)	A statutory process whereby planned projects must be assessed before a formal decision to proceed can be made. It involves assessment requirements outlined in the EIA Regulations, including the collection and consideration of environmental information, which fulfils the publication of an Environmental Impact Assessment Report (EIAR).
EIA Regulations	The collective term used to refer to the following: ▪ The Electricity Works (Environmental Impact Assessment)(Scotland) Regulations 2017; ▪ The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017; and ▪ The Marine Works (Environmental Impact Assessment) Regulations 2007.
Flight Information Region (FIR)	Airspace managed by a controlling authority with responsibility for ensuring air traffic services are provided to aircraft flying within it.
High Voltage Alternating Current (HVAC)	Refers to where the flow of electric current reverses direction in a regular frequency. HVAC supports bulk power flow over short to medium transmission distances.
High Voltage Direct Current (HVDC)	Refers to high voltage electricity in direct current form where current flows in one direction only. HVDC supports longer transmission infrastructure due to not experiencing reactive losses.
Instrument Meteorological Conditions (IMC)	IMC are meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for Visual Meteorological Conditions (VMC).
Inter-array Cables (IACs)	Cables which link the Wind Turbine Generators (WTGs) to each other and to the Offshore Substation Platforms (OSPs) within the Aspen Array Area.
Inter-link Cables	Cables that will link Offshore Substation Platforms (OSPs) within the Aspen Array Area.

Term	Definition
Landfall	The area between Mean Low Water Spring (MLWS) and Mean High Water Spring (MHWS) where the Offshore Transmission Cables (OTCs) will connect onshore to offshore.
Likely Significant Effect (LSE)	In the context of Environmental Impact Assessment (EIA), a Likely Significant Effect (LSE) refers to a predicted environmental impact of a proposed development that, by its nature, magnitude, duration or likelihood, has the potential to be significant in the context of the EIA Regulations. This determination is made during the EIA screening and scoping stages and helps establish whether a full EIA is required and what topics should be assessed in detail.
Offshore Environmental Impact Assessment Report (Offshore EIAR)	The published report of the EIA that will be undertaken for the Proposed Development. The subject Offshore EIAR is the offshore infrastructure of the Project seaward of Mean High Water Springs (MHWS).
Offshore Transmission Cable Corridor (OTC Corridor)	The area within which the Offshore Transmission Cables (OTCs) will be installed.
Offshore Transmission Cables (OTCs)	The subsea electricity cables running from Landfall in the region of Stonehaven to the Offshore Substation Platform(s) (OSP(s)) in the Aspen Array Area. The OTCs will act as both a demand and supply cable. The OTCs will provide both traditional supply of power to grid but also ensures robust secure power supply to oil and gas assets when the Aspen Array Area is not generating sufficient renewable power to support their demand.
Primary Surveillance Radar (PSR)	A radar system that measures the bearing and distance of targets using the detected reflections of radio signals.
Project	Aspen Offshore Wind Farm (OWF) - comprises the wind farm and all associated offshore and onshore components.
Proposed Development	The offshore components of the Project (Aspen Offshore Wind Farm) which include all offshore infrastructure associated with Aspen Array Area and the Offshore Transmission Cables (OTCs).
Secondary Surveillance Radar (SSR)	A radar system that transmits interrogation pulses and receives transmitted responses from suitably equipped targets.
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 Flight Rules (VFR)	VFR are the rules that govern the operation of aircraft in Visual Meteorological Conditions (VMC), conditions in which flight solely by visual reference is possible.
Visual Meteorological Conditions (VMC)	VMC are the meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling equal to or better than specified minima.
Wind Turbine Generator (WTG)	The wind turbine that generates electricity consisting of tubular towers and blades attached to a nacelle housing mechanical and electrical generating equipment.
Worst-case Design Scenario	The maximum design parameters of each offshore asset of the Proposed Development considered to be a worst case for any given assessment.

Abbreviations

Abbreviation	Definition
AARA	Air-to-Air Refuelling Area
ACP	Airspace Change Proposal
AD	Air Defence
AD&OW	Air Defence and Offshore Wind Farm Mitigation Task Force
AIP	Aeronautical Information Publication
AMSL	Above Mean Sea Level
ANO	Air Navigation Order
ATC	Air Traffic Control
ATS	Air Traffic Service
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CEA	Cumulative Effects Assessment
CMS	Construction Method Statement
CoP	Construction Programme
CTA	Control Area
DESNZ	Department for Energy Security and Net Zero
DGC	Defence Geographic Centre
DIO	Defence Infrastructure Organisation
DSLP	Development Specification and Layout Plan
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ERCoP	Emergency Response and Cooperation Plan
EUMETNET	European Meteorological Network
FIR	Flight Information Region
FL	Flight Level
HIAL	Highlands and Islands Airports Limited
HLV	Heavy Lift Vessel
HMRI	Helicopter Main Routing Indicator
HRA	Habitat Regulations Appraisal

Abbreviation	Definition
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
LAT	Lowest Astronomical Tide
LMP	Lighting and Marking Plan
LSE	Likely Significant Effects
MGN	Marine Guidance Note
MHWS	Mean High-Water Springs
MOD	Ministry of Defence
NATS	National Air Traffic Services
NLB	Northern Lighthouse Board
NOTAM	Notice to Aviation
NSP	Navigational Safety Plan
NSTA	North Sea Transition Authority
O&M	Operation and Maintenance
OLS	Obstacle Limitation Surface
OPERA	Operational Programme for the Exchange of Weather Radar Information
OREI	Offshore Renewable Energy Installation
OSA	Offshore Safety Area
OSP	Offshore Substation Platform
OTC	Offshore Transmission Cable
PEXA	Practice and Exercise Area
RAF	Royal Air Force
RIAA	Report to Inform Assessment
RLoS	Radar Line of Sight
RRH	Remote Radar Head
S&IP	Strategy and Implementation Plan
SAR	Search and Rescue
SSR	Secondary Surveillance Radar
TMZ	Transponder Mandatory Zone
TRA	Temporary Reserved Area
UK	United Kingdom

Abbreviation	Definition
UKHO	UK Hydrographic Office
VFR	Visual Flight Rules
VMC	Visual Meteorological Condition
WAM	Wide Area Multilateration
WPA	Whole Project Assessment
WTG	Wind Turbine Generator

Units

Unit	Definition
km	Kilometre
mm	Nautical Mile
m	Metre

15 Military and Civil Aviation

15.1 Introduction

15.1.1 Cerulean Winds Aspen Project Limited (hereafter referred to as the 'Applicant') is proposing to develop the Aspen Offshore Wind Farm (hereafter referred to as 'the Project'). The Project is made up of both offshore and onshore components. The subject of the Offshore Environmental Impact Assessment Report (Offshore EIAR) is the offshore infrastructure of the Project seaward of Mean High Water Springs (MHWS) which is hereafter referred to as 'the Proposed Development'.

15.1.2 The Aspen Array Area covers an area of approximately 333 km2 and is located approximately 84 km east of Peterhead on the east coast of Scotland. The offshore infrastructure of the Proposed Development includes Wind Turbine Generators (WTGs) and associated floating foundations, Offshore Substation Platform(s) (OSP(s)) and associated foundations, the Inter-array Cables (IACs), Inter-link Cables, Offshore Transmission Cables (OTCs) and Landfall.

15.1.3 This Chapter of the Offshore EIAR presents an assessment of the potential impacts and associated Likely Significant Effects (LSE) on military and civil aviation receptors from the Proposed Development and discusses appropriate mitigation and monitoring as required to address any significant effects. As per the Environmental Impact Assessment (EIA) Regulations, this Chapter specifically refers to the assessment of LSE on military and civil aviation receptors, seaward of MHWS, during pre-construction, construction, operation and maintenance (O&M), and decommissioning phases.

15.1.4 The term 'Likely Significant Effect' is used in both the EIA Regulations and the Habitat Regulations. The Offshore EIAR is accompanied by an Offshore Report to Inform Assessment (Offshore RIAA) (Cerulean Winds Aspen Project Limited, 2025) which uses the term as defined by the Habitat Regulations Appraisal (HRA) Regulations. The Offshore EIAR uses the term as defined in the 'EIA Regulations'.

15.1.5 This Chapter should be read alongside the following other Chapters and technical appendices:

- **Volume 2, Chapter 14: Shipping and Navigation**;
- **Volume 2, Chapter 19: Infrastructure and Other Marine Users**;
- **Volume 2, Chapter 21: Major Accidents and Disasters**; and
- **Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report**.

15.1.6 This Chapter includes a summary of information contained in **Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report**, which provides a detailed characterisation of military and civil aviation relevant to the Proposed Development, including a detailed analysis of the airspace occupied by the Aspen Array Area and outlines the effects that the Proposed Development is likely to have on aviation activities in the vicinity. This technical report also provides details of the Radar Line of Sight (RLoS) analysis conducted.

15.1.7 WTGs have the potential to cause a variety of adverse effects on military and civil aviation receptors. WTGs can impact the radars used by civilian and military air traffic controllers because the characteristics of moving turbine blades are similar to those of aircraft, leading to spurious returns, or clutter, on radar displays. This can affect the safe provision of air traffic services or interfere with tracking of aircraft by the military. WTGs can also have the potential to present a physical obstruction for aviation activities such as military low flying or helicopter Search and Rescue (SAR) operations.

15.1.8 Aviation stakeholders potentially affected include the Civil Aviation Authority (CAA), National Air Traffic Services (NATS), the Ministry of Defence (MOD), Aberdeen International Airport, Highlands and Islands Airports Limited (HIAL), and offshore helicopter operators such as Bristow Group, who currently deliver the United Kingdom (UK) SAR contract on behalf of His Majesty's Coastguard.

15.1.9 This Chapter refers to the design of the Proposed Development as described in **Volume 1, Chapter 3: Project Description** of the Offshore EIAR.

15.1.10 This Chapter has been prepared by Cyrrus Ltd. on behalf of the Applicant.

15.2 Purpose of the Chapter

15.2.1 The primary purpose of the Offshore EIAR is defined in **Volume 1, Chapter 1: Introduction**.

15.2.2 The key objective of this Chapter is to provide Scottish Ministers, statutory and non-statutory stakeholders the information required to assess for LSE upon military and civil aviation due to the Proposed Development.

15.2.3 This Chapter presents the following:

- A detailed description of current environmental baseline conditions relevant to military and civil aviation. These have been established from a desktop review of existing aviation documentation and charts. The primary sources of aviation related data are the UK civil and military Aeronautical Information Publications (AIPs);
- Discussion of assumptions and any limitations with respect to the information used to define the baseline;
- Identification of potential impacts and assessment of any resulting LSE on military and civil aviation related to Proposed Development activities. This process is informed by the application of embedded commitments;
- Consideration of the need for any 'secondary' mitigation measures (in addition to embedded commitments) to avoid, minimise, reduce, or offset LSE on military and civil aviation from the Proposed Development;
- Consideration of any residual effects following application of secondary mitigation; and
- Identification of monitoring measures to support proposed mitigation.

15.3 Legislation and Policy Context

15.3.1 Overarching legislation, policy, and guidance in relation to the Offshore EIAR for the Proposed Development is provided in **Volume 1, Chapter 2: Policy and Legislative Context** of the Offshore EIAR. A summary of legislation (Table 15.1), policy (Table 15.2), and guidance directly relevant to military and civil aviation is provided in the following sections.

Legislation and Policy

15.3.2 A summary of any relevant legislation is provided below within Table 15.1 below. All policy directly applicable to military and civil aviation is presented in Table 15.2.

Table 15.1 Table of Relevant Legislation for Military and Civil Aviation

Legislation	Summary	How/Where This Chapter has Considered This
Air Navigation Order (ANO) 2016/765 (CAA, 2022).	The ANO 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. Article 222 details the requirements for the lighting of en-route obstacles that are 150 m or more above ground level. Article 223 modifies the requirements of Article 222 with respect to WTGs in UK territorial waters of 60 m or more above the level of the sea at the highest astronomical tide. Article 225A details the requirements for notifying the CAA of any planned works to erect new en-route obstacles that are 100 m or more above sea level.	Lighting requirements will inform the embedded commitment measures outlined in Table 15.8 (C-OFF-29, C-OFF-30, C-OFF-46, and C-OFF-51). Notification requirements will inform the embedded commitments measures outlined in Table 15.8 (C-OFF-30 and C-OFF-51).

Table 15.2 Table of Relevant Policy for Military and Civil Aviation

Legislation	Summary	How/Where This Chapter has Considered This
Civil Aviation Publication (CAP) 764: Policy and Guidelines on Wind Turbines (CAA, 2016)	CAP 764 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 764 guidance has informed the military and civil aviation study area (section 15.5) and assessment of LSE (section 15.7).
National Planning Framework 4 (Scottish Government, 2024)	The Energy policy (Policy 11) states that project design and mitigation will demonstrate how impacts on aviation and defence interests are addressed.	The effects of construction, operation and maintenance, and decommissioning phases of the Proposed Development have been assessed in section 15.7.
Scotland's National Marine Plan (Scottish Government, 2015)	Chapter 15: Defence 1 To maintain operational effectiveness in Scottish waters used by the armed services, development and use will be managed in these areas: ▪ Naval areas including bases and ports: Safety of navigation and access to naval bases and ports will be maintained. The extent to which a development or use interferes with access or safety of navigation, and whether reasonable alternatives can be identified, will be taken into account by consenting bodies. Proposals for development and use should be discussed with the MOD at an early stage in the process. ▪ Firing Danger Areas: Development of new permanent infrastructure is unlikely to be compatible with the use of Firing Danger Areas by the MOD. Permitted activities may have temporal restrictions imposed. Proposals for development and use should be discussed with the MOD at an early stage in the process. ▪ Exercise Areas: Within Exercise Areas, activities may be subject to temporal restrictions. Development and use that either individually or cumulatively obstructs or otherwise prevents the defence activities supported by an exercise area may not be permitted. Proposals for development and use should be discussed with the MOD at an early stage in the process.	The effects of the construction, operation and maintenance and decommissioning phases of the Proposed Development have been assessed in section 15.7. Consultation with the Defence Infrastructure Organisation (DIO), representing the MOD has taken place as highlighted in Table 15.3. Embedded commitment measures are highlighted in section 15.6.

Legislation	Summary	How/Where This Chapter has Considered This
	▪ Communications: Navigations and surveillance including radar: Development and use which causes unacceptable interference with radar and other systems necessary for national defence may be prohibited if mitigation cannot be determined. Proposals for development and use should be discussed with the MOD at an early stage in the process. Chapter 15: Defence 2 For the purposes of national defence, the MOD may establish by-laws for exclusions and closures of sea areas. In most areas this will mean temporary exclusive use of areas by the MOD. Where potential for conflict with other users is identified, appropriate mitigation will be identified and agreed with the MOD, prior to planning permission, a marine licence, or other consent being granted.	

15.3.3 All guidance directly applicable to military and civil aviation includes the following documents:

- CAP 168: Licensing of Aerodromes (CAA, 2022);
- CAP 670: Air Traffic Services Safety Requirements (CAA, 2019);
- CAP 1616: Airspace Change Process (CAA, 2024a);
- CAP 437: Standards for Offshore Helicopter Landing Areas (CAA, 2023b);
- CAP 032: UK AIP (CAA, 2025);
- CAP 774: UK Flight Information Services (CAA, 2021);
- UK Military AIP (MOD, 2025);
- MOD Obstruction Lighting Guidance (MOD, 2020);
- 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); and
- MCA document OREIs: Requirements, Guidance and Operational Considerations for SAR and Emergency Response (MGN 654 Annex 5) (MCA, 2024).

15.4 Consultation

15.4.1 Continuous consultation (statutory and non-statutory) and incorporation of feedback is critical in developing a robust Offshore EIAR. The Offshore Scoping Report for the Proposed Development (**Volume 3, Appendix 6.1: Offshore Scoping Report**) was submitted to the Marine Directorate – Licensing Operations Team (MD-LOT) in January 2025. MD-LOT issued a detailed response to the Offshore Scoping Report in the May 2025 Offshore Scoping Opinion (**Volume 3, Appendix 6.2: Offshore Scoping Opinion**), covering its own opinion on the Offshore Scoping Report as well as the statutory and non-statutory consultees' advice on each topic.

15.4.2 A summary of the stakeholder consultation activities specific to military and civil aviation is provided in Table 15.3 in which the issues are raised and the actions to address them are incorporated throughout the Offshore EIAR.

15.4.3 Further detail on the Proposed Development's overall EIA stakeholder consultation process is presented in **Volume 1, Chapter 6: Consultation** of the Offshore EIAR.

Table 15.3 Consultation Relevant to Military and Civil Aviation

Date	Consultee and Type of Consultation	Description/Issues Raised	How This has Been Considered in This Chapter
March, 2024	NATS Safeguarding – Pre-Scoping Consultation, Email	WTGs with a maximum tip height of 283 m Above Mean Sea Level (AMSL) within a portion of the Aspen Array Area. The Allanshill radar is limited to a range of 60 Nautical Miles (nm), therefore RLoS coverage beyond this range can be ignored. WTGs with a maximum tip height of 283 m AMSL within the Aspen Array Area will not be within RLoS of Perwinnes but should still be considered as RLoS coverage at this range is borderline. The Aspen Array Area overlaps Helicopter Main Routing Indicators (HMRIs). Engagement with the helicopter operators would be expected, this may involve NATS. Wide Area Multilateration (WAM) sensors are resilient to interference from WTGs due to their distributed nature. The closest sensor on the Gannet platform is over 20 km away, NATS likely won't have any concerns in relation to WAM sensors.	The impact to all NATS receptors has been assessed with the increased tip height of 310 m AMSL, taller than that considered at scoping (283 m AMSL). Impact on Allanshill radar is assessed in section 15.7. RLoS analysis conducted in Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report confirmed that Perwinnes will not have RLoS of WTGs with the taller WTG tip height of 310 m AMSL. The potential impact to Perwinnes has therefore been scoped out in Table 15.9. Impacts on helicopters, including those operated by the Aberdeen Offshore sector, are assessed in section 15.7. WAM sensors have been scoped out in Table 15.9.
May, 2025	MD-LOT Scoping Opinion	The Scottish Ministers agree with the study area proposed and the categorisation of the baseline and are broadly content with the impacts to be scoped in and out regarding military and civil aviation. These views are supported by MOD representation.	Potential impacts scoped in during the scoping stage have been assessed further in section 15.7.
May, 2025	Aberdeen Airport – Representation to MD-LOT during consultation on Scoping Report	The proposal is located outwith the consultation zone for Aberdeen Airport. As such the Aberdeen Airport have no comment to make and no need to be consulted further.	Noted.
May, 2025	DIO representing the MOD – Representation	Within paragraph 15.4.17 to 15.4.20 of Chapter 15, it is stated that the Proposed Development is located close	Noted.

Date	Consultee and Type of Consultation	Description/Issues Raised	How This has Been Considered in This Chapter
	to MD-LOT during consultation on Scoping Report	to Danger Areas (EGD613A and EGD901) and Air to Air Refuelling Areas (AARA) 02, 03, and 04. The OTC is located is only underneath D613A. The MOD acknowledge and agree with this assessment.	
May, 2025	DIO representing the MOD – Representation to MD-LOT during consultation on Scoping Report	The scoping report identifies that WTGs have the potential to affect and be detectable to Primary Surveillance Radars (PSRs) of both military and civilian systems. Within paragraph 15.4.21 it is determined that RAF Lossiemouth is the closest MOD aerodrome to the Proposed Development site which benefits from a deployed PSR. In paragraph 15.7.7, the applicant notes that the impact of the development on the PSR at Lossiemouth has been scoped out on the basis that the development would be outside RLoS, MOD assessment has identified no need to object to this approach.	Noted.
May, 2025	DIO representing the MOD – Representation to MD-LOT during consultation on Scoping Report	At paragraph 15.4.22 the Scoping Report identified that the proposed turbines would be in RLoS to Air Defence radar systems deployed/sited at Remote Radar Head (RRH) Buchan. Table 15.3 identifies that WTG, by virtue of their size, location and rotation have the potential to impact on the operation and capability of AD radar systems and acknowledges that work on this impact is to be scoped into the forthcoming detailed assessment. The MOD would agree with that assessment and that further work on this issue should be carried out.	Impacts to RRH Buchan are assessed in section 15.7. The Applicant will engage with the MOD regarding their programme NJORD which has been launched for the provision of effective mitigation for Air Defence radars including RRH Buchan.
May, 2025	DIO representing the MOD – Representation to MD-LOT during consultation on Scoping Report	The potential for development to create physical obstacles, during both the implementation and operational stages of the development, to low flying aircraft has been acknowledged by the applicant within Chapter 15 and specific reference is made at 15.5.1 and	MOD lighting requirements will be considered and followed as per embedded commitment C-OFF-29. See Table 15.8.

Date	Consultee and Type of Consultation	Description/Issues Raised	How This has Been Considered in This Chapter
		within table 15.3, to scoping the effect on military low flying aircraft into the assessment of military and civil aviation. The MOD would support this approach.	
May, 2025	Edinburgh Airport – Representation to MD-LOT during consultation on Scoping Report	The Proposed Development falls out with the Aerodrome Safeguarding zone for Edinburgh Airport. Therefore Edinburgh Airport has no objection/comment.	Noted.
May, 2025	NATS – Representation to MD-LOT during consultation on Scoping Report	The Proposed Development has been examined by our technical safeguarding teams. In the timeframe given to us we have been unable to thoroughly investigate the effects of the proposed development on our operations, however, the relevant teams are being consulted. Based on our preliminary technical findings, the Proposed Development does conflict with our safeguarding criteria. Accordingly, NATS (En Route) plc objects to the proposal. We will notify you within 4-6 weeks of the results of our operational assessment. Only if this assessment shows the impact to be acceptable will we be able to withdraw our objection.	Potential impact to NATS Allanshill has been assessed within section 15.7. NATS has since provided a Technical and Operational Assessment (TOPA) which is listed below.
May, 2025	NATS – TOPA For Cerulean Winds Aspen Project Limited	Predicted Impact on Allanshill Radar (only the portion of the Proposed Development within 60 nm). Using the theory described in Appendix A and development specific propagation profile it has been determined that the terrain screening available will not adequately attenuate the signal, and therefore this development is likely to cause false primary plots to be generated. A reduction in the RADAR's probability of detection, for real aircraft, is also anticipated.	Potential impact to NATS Allanshill has been assessed within section 15.7. Consultation with NATS will continue with the aim of delivering a suitable mitigation solution for PSR impact.

Date	Consultee and Type of Consultation	Description/Issues Raised	How This has Been Considered in This Chapter
May, 2025	NATS – TOPA For Cerulean Winds Aspen Project Limited	En-route operational assessment of radar impact: Where an assessment reveals a technical impact on a specific NATS' RADAR, the users of that RADAR are consulted to ascertain whether the anticipated impact is acceptable to their operations or not. ▪ Prestwick ATC: Unacceptable ▪ Aberdeen ATC: Unacceptable ▪ Military ATC: Acceptable	Impact on the provision of ATC is considered in section 15.7. Consultation with NATS will continue with the aim of delivering a suitable mitigation solution for PSR impacts.
May, 2025	NATS – TOPA For Cerulean Winds Aspen Project Limited	Predicted impact on en-route navigation aids: No impact is anticipated on NATS' navigation aids.	Noted.
May, 2025	NATS – TOPA For Cerulean Winds Aspen Project Limited	Predicted impact on radio communications infrastructure: No impact is anticipated on NATS' radio communications infrastructure.	Noted.

15.5 Baseline Environment

15.5.1 This section presents a summary of the military and civil aviation baseline environment study area, the methodology, baseline conditions and limitations and assumptions of the data used. The supporting analysis undertaken to develop this baseline is provided in **Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report**.

15.5.2 The main issue identified is associated with potential WTG interference for PSRs. Due to the physical size of the WTGs proposed, there is also potential for WTGs to become aviation obstacles or obstructions, particularly to helicopters engaged in offshore operations.

15.5.3 The construction of WTGs at Ardersier Port and towing of WTGs create a temporary aviation obstacle environment which may impact Instrument Flight Procedures (IFPs) at Inverness Airport, Aberdeen International Airport, and Royal Air Force (RAF) Lossiemouth.

Study Area

15.5.4 Figure 15.1 shows the military and civil aviation study area. This includes the following elements of the Proposed Development:

- Aspen Array Area; and
- OTC Corridor.

15.5.5 WTGs will be constructed at Ardersier Port and then towed out one by one to the Aspen Array Area. Although the towage route has not yet been defined, aviation receptors may be impacted along the coastline. For this reason, aviation receptors within the vicinity of Ardersier Port and along the coastline from the report have been considered within this Chapter.

15.5.6 In considering the spatial coverage of the military and civil aviation study area, the overriding factor is the potential for WTGs within the Aspen Array Area to have an impact on civil and military radars, considering required radar operational ranges. In general, PSRs installed on civil and military airfields have an operational range of between 40 nm (74 km) and 60 nm (111.1 km). All radar equipped airfields within 60 nm (111.1 km) of the Aspen Array Area are therefore included in the study area. En-route radars operated by NATS, and military Air Defence (AD) radars are required to provide coverage at ranges in excess of 60 nm (111.1 km) and so all such radars with potential RLoS of WTGs in the Aspen Array Area are also included in the study area.

15.5.7 The military and civil aviation study area is defined by the Proposed Development footprint together with the airspace between the Aspen Array Area and the UK mainland. The study area also considers the potential for the construction of WTGs at Ardersier Port and the towing of WTGs from port to the Aspen Array Area. The study area extends from Inverness Airport to the west, to Aberdeen International Airport to the south-west.

Civil Aerodromes

15.5.8 CAP 764: Policy and Guidelines on Wind Turbines (CAA, 2016) states the distances from various types of aerodromes for WTG developments where consultation should take place. These distances include:

- Aerodromes with a surveillance radar – 30 km;
- Licensed aerodromes where the WTGs will lie within airspace coincidental with any published IFP;
- Non-radar equipped licensed aerodromes with a runway of 1,100 m or more – 17 km;
- Non-radar equipped licensed aerodromes with a runway of less than 1,100 m - 5 km;
- Unlicensed aerodromes with runways of more than 800 m – 4 km;
- Unlicensed aerodromes with runways of less than 800 m – 3 km;
- Gliding sites – 10 km; and
- Other aviation activity such as parachute sites and microlight sites within 3 km.

15.5.9 CAP 764 goes on to state that these distances are for guidance purposes only and do not represent ranges beyond which all WTG developments will be approved or within which they will always be objected to. For example, aerodromes may utilise their radars at ranges considerably in excess of 30 km.

15.5.10 As well as examining the technical impact of WTGs on Air Traffic Control (ATC) facilities, it is also necessary to consider the physical safeguarding of ATC operations using the criteria laid down in CAP 168: Licensing of Aerodromes (CAA, 2022) to determine whether a Proposed Development has the potential to breach obstacle clearance criteria at any aerodromes.

Ministry of Defence

15.5.11 It is necessary to take into account the aviation and AD activities of the MOD. This includes:

- MOD airfields, both radar and non-radar equipped;
- MOD AD radars; and
- MOD Practice and Exercise Areas (PEXAs) for both aviation and non-aviation activities.

NATS Facilities

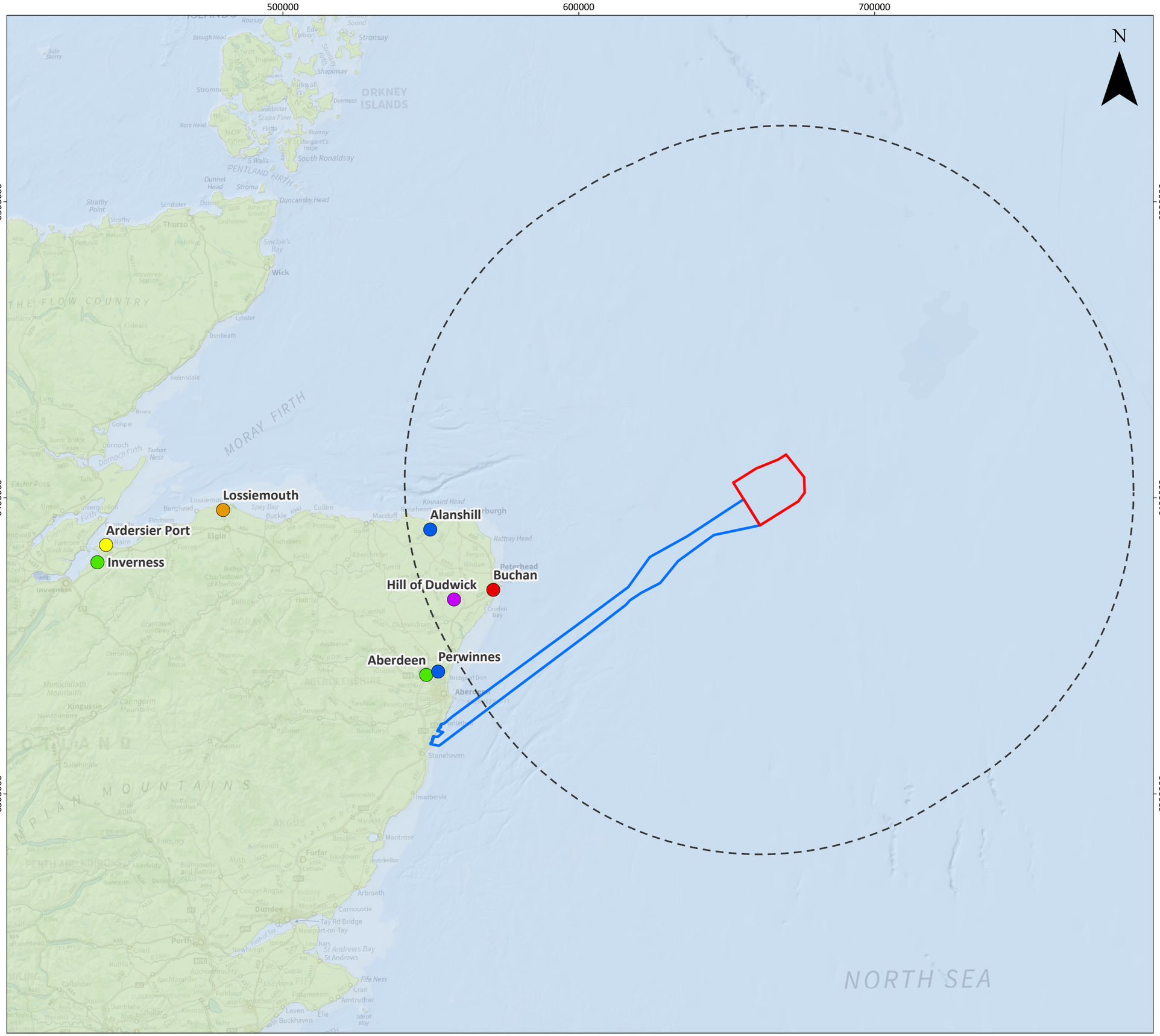
15.5.12 It is necessary to consider the possible impacts of WTGs upon NATS en-route electronic infrastructure; a UK-wide network of primary and secondary radars and navigation facilities.

Other Aviation Activities

15.5.13 Other aviation activities under consideration include:

- General military low flying training operations; and
- Military and civilian ‘off-route’ fixed-wing and helicopter operations, SAR missions and offshore helicopter operations in support of offshore wind developments and the oil and gas industry.

15.5.14 WTGs have the potential to adversely impact meteorological radio facilities such as weather radar. The Met Office must be consulted when wind turbine proposals are within a 20 km radius zone of any of their UK weather radar sites. Due to their large size, WTGs that are beyond 20 km from weather radar sites can still have an impact on these facilities. For this reason, any weather radars with potential RLoS of WTGs in the Aspen Array Area are under consideration.



Aspen Offshore Wind Farm
Environmental Impact Assessment

Military and Civil Aviation Study Area

Legend

- Aspen Array Area
- Offshore Transmission Cable Corridor
- Study Area (60nm Buffer from Array)
- Air Defence Radars
- Ardersier Port
- Civil Airports
- Military Airfields
- NATS Radars
- Weather Radar

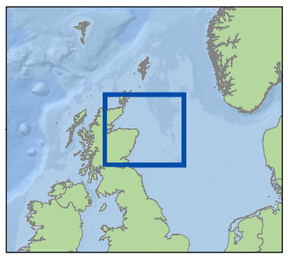


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Figure 15.1

Figure Reference: ASPEN_AVI_Fig15.1_StudyArea_v2

15.5.15 Baseline data to inform the military and civil aviation assessment was collected using the following methods:

Desktop Study

15.5.16 For the purpose of this Chapter, a desk-based review was undertaken using relevant data sources. The primary sources of aviation related data used for the desktop study are the UK civil and military AIPs. The AIPs contain details on airspace and en-route procedures as well as charts and other air navigation information.

15.5.17 Relevant existing data sets and literature are presented in Table 15.4. These sources have been used to determine the aviation stakeholders that may be affected by the Proposed Development, including all radar systems within operational range.

Table 15.4 Key Sources of Military and Civil Aviation Literature and Data

Source, Author and Year	Summary	Coverage of Proposed Development Study Area
CAP 032: UK AIP, CAA, 2025.	Contains information on facilities, services, rules, regulations and restrictions in UK airspace.	Full coverage of the study area.
UK Military AIP, MOD, 2025.	The main resource for information and flight procedures at all UK military aerodromes.	Full coverage of the study area.
Wind farm self-assessment maps, NATS, 2012.	Maps provided by NATS to ascertain potential impact of WTGs on their en-route electronic infrastructure.	Full coverage of the study area.
Offshore infrastructure data, North Sea Transition Authority (NSTA), 2025.	Regularly updated NSTA offshore shapefiles.	Full coverage of the study area.
Office of Communications (Ofcom) Protected Radar List, Ofcom, 2024.	Lists the locations and antenna heights of UK civil and military PSRs.	Full coverage of the study area.
Protecting our observing capability, Met Office.	Information and guidance for developers, including maps of consultation zones and a list of Met Office weather radar and radio sites in the UK.	Full coverage of the study area.
Operational Programme for the Exchange of Weather Radar Information (OPERA) Database, European Meteorological Network (EUMETNET), 2025.	Contains information on weather radars throughout the UK.	Full coverage of the study area.

Source, Author and Year	Summary	Coverage of Proposed Development Study Area
Helideck Certificates, Helideck Certification Agency (HCA), 2025.	Contains helideck certificates for offshore oil and gas platforms.	Full coverage of the study area.

Description of Baseline Environment

15.5.18 A summary of the military and civil aviation baseline environment is provided in the following sections. Full details of the analysis undertaken to develop the military and civil aviation baseline is provided in **Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report**. The technical report also includes information on modelling used to determine which radars may have RLoS of WTGs within the Aspen Array Area.

Civil Aviation

15.5.19 The airspace above and adjacent to the Aspen Array Area is used by both civil and military aircraft and lies within the Scottish Flight Information Region (FIR) for ATC. This airspace is regulated by the UK CAA. The Scottish FIR is adjacent to the Polaris FIR, regulated by CAA Norway. The boundary of the Polaris FIR is located 173 km to the north-east of the Aspen Array Area at its closest point.

15.5.20 Airspace is classified as either controlled or uncontrolled and is divided into a number of classes depending on what kind of Air Traffic Service (ATS) is provided and under what conditions. In the UK there are five classes of airspace: specifically; A, C, D, E and G. The first four are controlled airspace while Class G is uncontrolled. Within controlled airspace, aircraft are monitored and instructed by ATC. Aircraft within uncontrolled airspace, are not subject to ATC instruction but rather operate according to a simple set of regulations. ATC may still provide information, if requested, to ensure flight safety.

15.5.21 Aircraft operate under one of two flight rules: Visual Flight Rules (VFR) or Instrument Flight Rules (IFR). VFR flight is permitted when the weather satisfies Visual Meteorological Conditions (VMC) and is conducted with visual reference to the natural horizon. Aircraft must be flown under IFR when weather restricts visibility, known as Instrument Meteorological Conditions (IMC). IFR flight requires reference solely to aircraft instrumentation.

15.5.22 From sea level to Flight Level (FL) 195 (approximately 19,500 ft) AMSL), the airspace above the Aspen Array Area is Class G uncontrolled airspace. This airspace is predominately used by low level flight operations and generally by aircraft flying under VFR. Under VFR pilots fly and navigate with reference to the natural horizon and terrain features. Pilots are required to maintain minimum distances from notified obstacles, including WTGs, and may only fly within the minimum weather and visibility criteria (VMC).

15.5.23 Above FL 195 (approximately 19,500 ft AMSL) covering most of the Aspen Array Area is the Moray Control Area (CTA) which is controlled airspace. This airspace is divided into CTAs 1 to 17. The Aspen Array Area lies underneath Moray CTA 15, Class C airspace with an upper limit of FL 245 (approximately 24,500 ft AMSL).

15.5.24 Above FL 195 (approximately 19,500 ft AMSL) over the southern section of the Aspen Array Area is Class C controlled airspace in the form of Temporary Reserved Area (TRA) 007B. TRA 007B has an upper vertical limit of FL 245 (approximately 24,500 ft AMSL) and is available for use by both military and civil aircraft, though its main use is to accommodate VFR military flying activity.

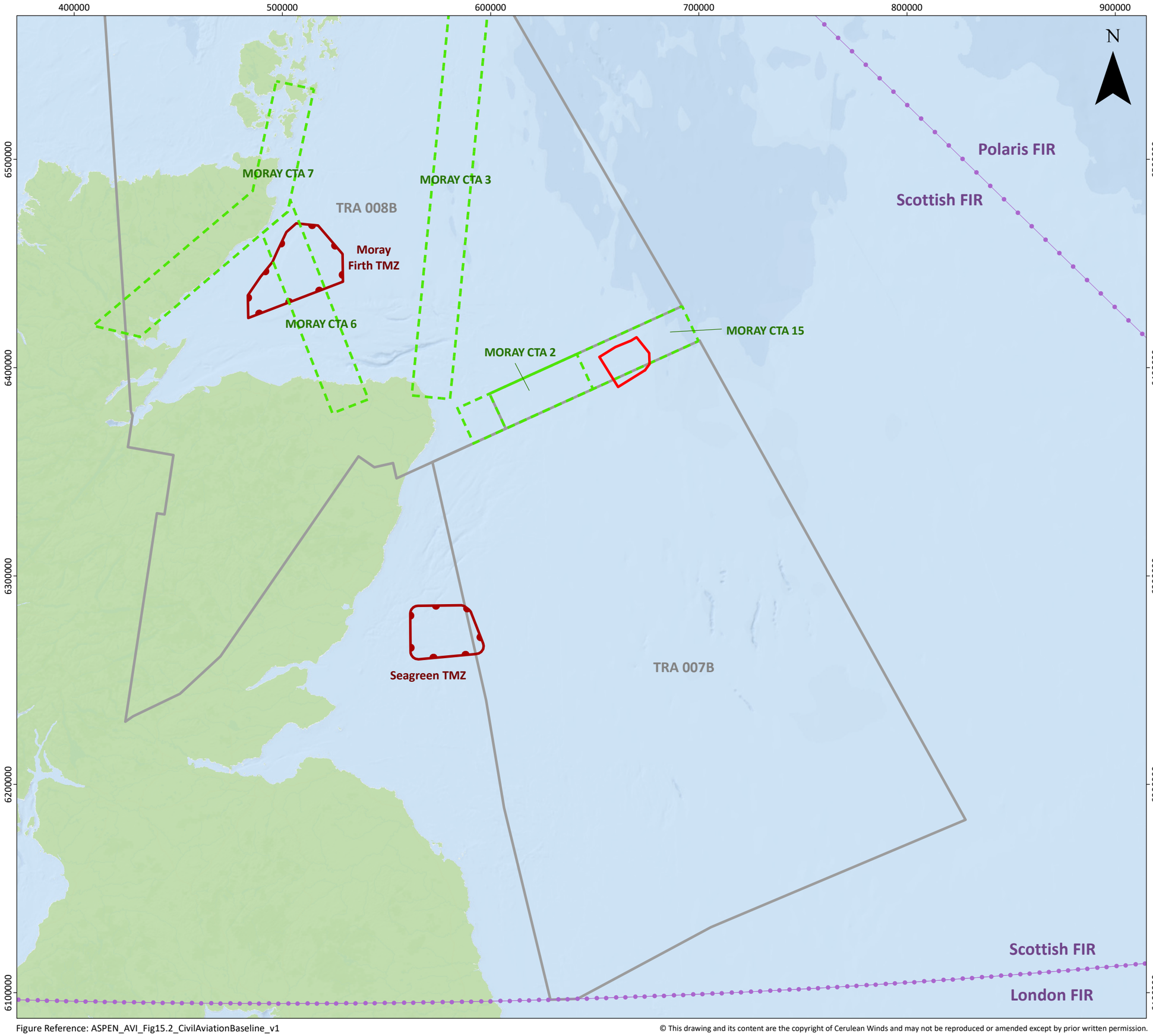
15.5.25 Above FL 245 (approximately 24,500 ft AMSL) is Class C upper airspace which has an upper limit of FL 660 (approximately 66,000 ft AMSL).

15.5.26 There are two Transponder Mandatory Zones (TMZs) within the vicinity of the Aspen Array Area. Located 128.4 km to the north-west and 128.5 km to the south-east of the Aspen Array Area are the Moray Firth and Seagreen Phase 1 TMZs respectively. Within a TMZ the carriage and operation of aircraft transponder equipment is mandatory. This enables such aircraft to be detected and tracked by Secondary Surveillance Radar (SSR) systems. Moray Firth TMZ surrounds Moray East, Moray West and Beatrice OWFs. The Seagreen Phase 1 TMZ surrounds the Seagreen Phase 1 OWF. These TMZs are used to mitigate the impact the associated WTGs have on PSR. Both of these TMZs are active from sea level to FL 100 (approximately 10,000 ft AMSL). Subject to the predicted impacts of the Aspen Array Area, the establishment of a TMZ over the Aspen Array Area is a potential mitigation measure to be considered for impact to PSR systems.

15.5.27 The nearest UK civil airport to the Aspen Array Area is Aberdeen International Airport, located 123.6 km to the south-west of the Aspen Array Area as shown in Figure 15.1. Aberdeen International Airport is Scotland's third busiest airport, the 16th busiest in the UK, and is the main heliport for the North Sea oil and gas industry.

15.5.28 NATS provides en route civil air traffic services within the Scottish FIR and operates a network of radar facilities providing information for ATC on both civil and military aircraft. The nearest NATS radar facilities to the Aspen Array Area are Allanshill and Perwinnes, situated 103.6 km to the west and 119.4 km to the south-west respectively as shown in Figure 15.1.

15.5.29 Consultation with NATS Safeguarding has indicated that WTGs will be within RLoS of Allanshill, however, NATS also stated that this radar has a maximum range of 60 nm and coverage beyond this range can be disregarded. This range has been included in RLoS analysis conducted in Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report. The results indicate that WTGs with a maximum blade tip height of 310 m AMSL within the western section of the Aspen Array Area will be within RLoS of Allanshill PSR, but not visible to Perwinnes PSR. NATS Safeguarding has also confirmed that although Perwinnes PSR will not have RLoS of WTGs, the close proximity of this coverage must be considered.



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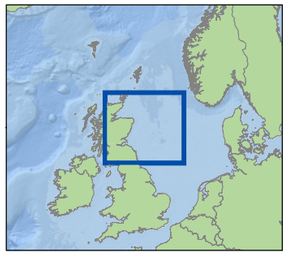
Aspen Offshore Wind Farm
Environmental Impact Assessment

Civil Aviation Baseline Including Aspen Array Area FIR Boundaries and Civil Airspace and TMZ

Legend

- Aspen Array Area
- CTA
- Transponder Mandatory Zones
- Temporary Reserved Areas
- FIR Boundary



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0 25 50 nm

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Figure 15.2

Figure Reference: ASPEN_AVI_Fig15.2_CivilAviationBaseline_v1

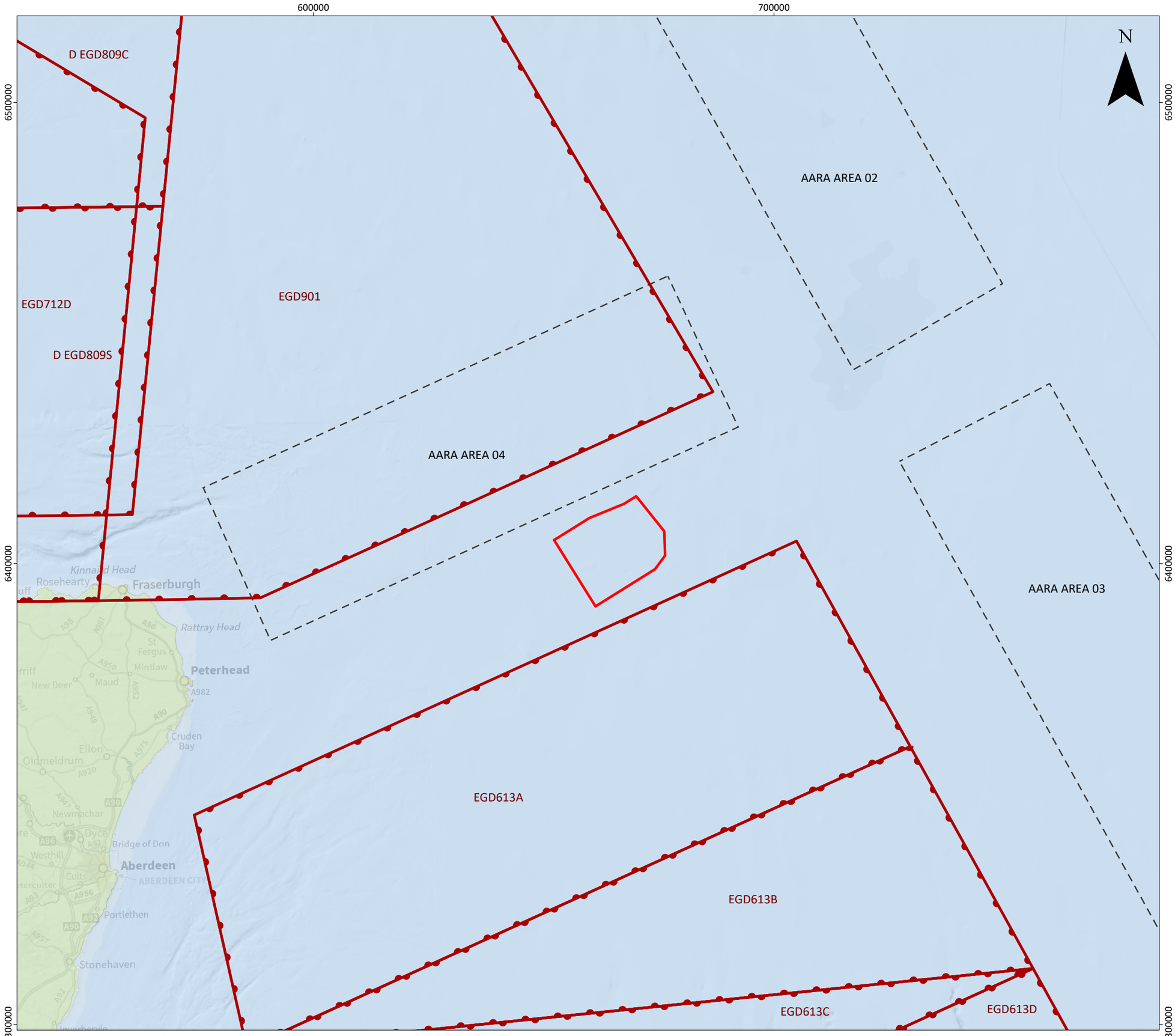
15.5.30 The closest military airspace to the Aspen Array Area is the Central Complex, located 5 km to the south at its closest point. This Danger Area is one of four such complexes in UK airspace that, when activated, provide segregated airspace for military flight training. The closest element of this airspace is Danger Area D613A, which has a lower limit of FL 100 and an upper limit of FL 660 (approximately 10,000 ft and 66,000 ft AMSL respectively). Activities within this area include high energy manoeuvres, ordnance, munitions and explosives.

15.5.31 Located 13.6 km to the north of the Aspen Array Area at its closest point is the Fast Jet Area North Danger Area, D901. This airspace has a lower limit of FL 245 and an upper limit of FL 550 (approximately 24,500 ft and 55,000 ft AMSL respectively). Activities within this area include high energy manoeuvres, ordnance, munitions and explosives.

15.5.32 The Aspen Array Area is located within the vicinity of AARAs 02, 03, and 04, situated 54.5 km to the north-east, 53.2 km to the east, and 4.2 km to the north respectively. AARA 02 and 03 have a lower limit of FL 100 and an upper limit of FL 290 (approximately 10,000 ft and 29,000 ft AMSL respectively). AARA 04 has a lower limit of FL 70 and an upper limit of FL 240 (approximately 7,000 ft and 24,000 ft above MSL respectively).

15.5.33 The nearest military airfield to the Aspen Array Area is the RAF Lossiemouth, located 172.8 km to the west of the Aspen Array Area. The PSR at RAF Lossiemouth has an operational range of 60 nm (111.1 km). WTGs will therefore be located outside of the operational range of the RAF Lossiemouth PSR.

15.5.34 The closest MOD AD radar to the Aspen Array Area is RRH Buchan, situated 88.6 km to the south-west. Buchan AD was included in RLoS analysis conducted in **Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report.** Results indicate that WTGs with a maximum tip height of 310 m AMSL within the Aspen Array Area will be within RLoS of the Buchan AD radar.



CERULEAN WINDS

Aspen Offshore Wind Farm
Environmental Impact Assessment

Military Aviation Baseline including AARA and Danger Areas

Legend

- Aspen Array Area
- Danger Area
- Air-to-Air Refuelling Area

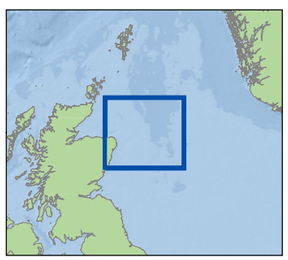


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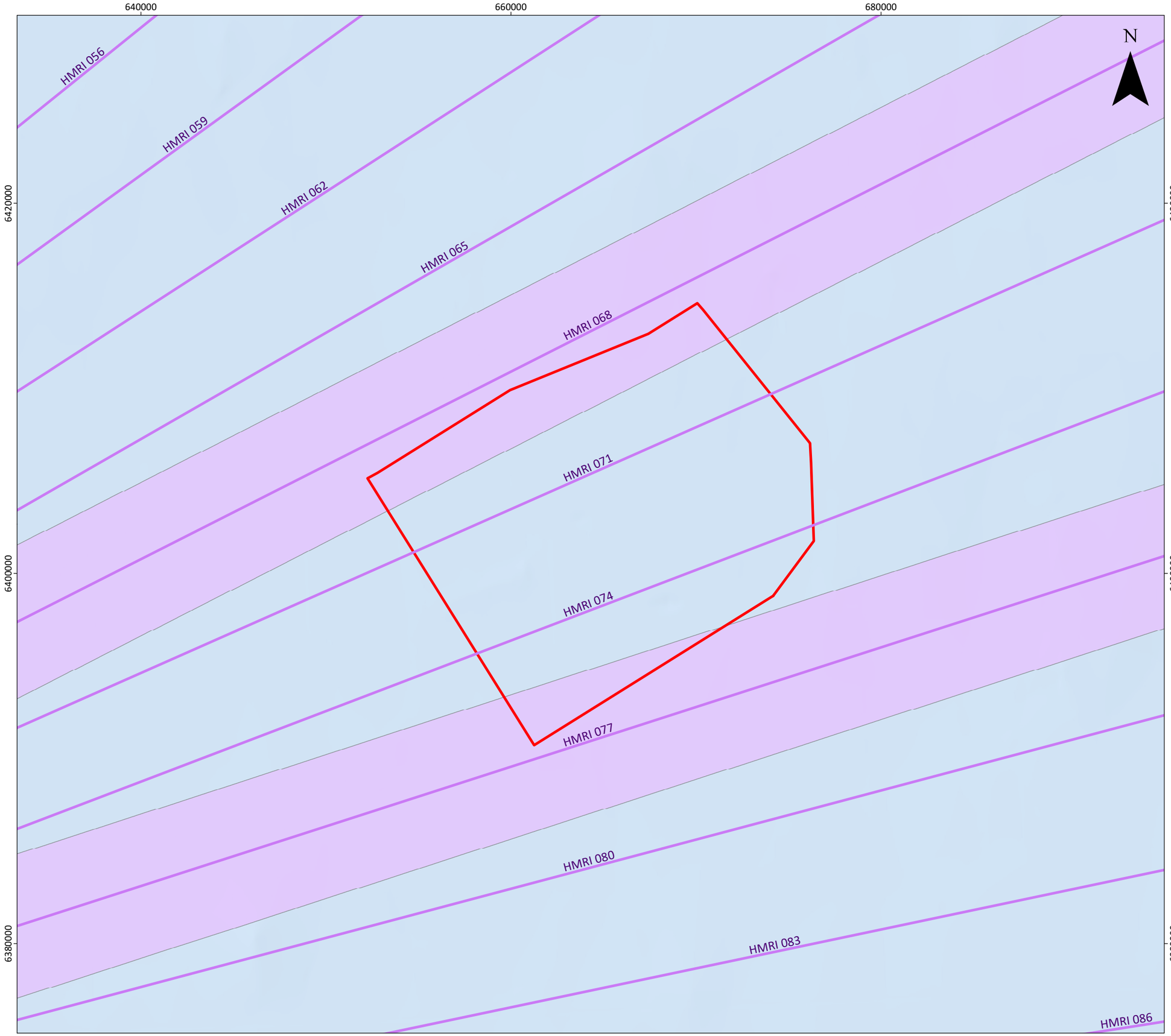
Figure 15.3

Figure Reference: ASPEN_AVI_Fig15.3_MilitaryAviationBaseline_v1

15.5.35 The Aspen Array Area is located within the Aberdeen Offshore Safety Area (OSA), which has a vertical limit of sea level to FL 100 (approximately 10,000 ft AMSL). The Aberdeen OSA is the busiest airspace in the vicinity in terms of offshore helicopter traffic and contains a network of offshore routes over the North Sea that are flown by helicopters in support of oil and gas installations. These routes are published on charts as HMRIs and, together with the OSA, alert other airspace users of the potential for frequent low-level helicopter traffic.

15.5.36 The Aspen Array Area is overlapped by the centrelines of HMRIs 071 and 074. In addition, the Aspen Array Area is within 2 nm of the centrelines of HMRIs 068 and 077.



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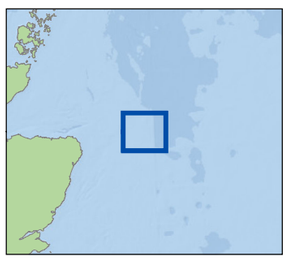
Aspen Offshore Wind Farm
Environmental Impact Assessment

Helicopter Main Routing Indicators

Legend

- Aspen Array Area
- 2nm Buffer Zone
- HMRI Centrelines



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0 2.5 5 nm

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Figure 15.4

Figure Reference: ASPEN_AVI_Fig15.4_HMRIs_v1

15.5.37 To help achieve a safe operating environment, CAP 764 guidance establishes a 9 nm consultation zone for planned obstacles around offshore helicopter destinations. Within 9 nm, obstacles such as WTGs can potentially impact upon the feasibility of helicopters to safely fly low visibility or missed approach procedures at their associated helideck site. The nearest active offshore helideck to the Aspen Array Area is Buzzard, located 32.4 km (17.5 nm to the west and therefore outside of the 9 nm consultation zone.

650000
700000
6450000
6400000
6350000
N
Alba Northern
Alba FSU
Golden Eagle
Buzzard
Forties Bravo
Forties Alpha
Forties Charlie
Forties Delta
Forties Echo
Kittiewake
Anasuria

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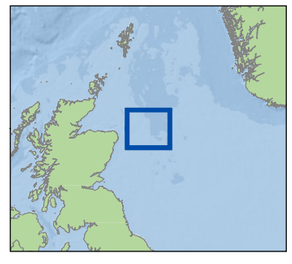
Environmental Impact Assessment

Offshore Helidecks

Legend

- Aspen Array Area
- 9nm Buffer Zone
- Offshore Helideck



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0 5 10 nm

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Figure 15.5

Figure Reference: ASPEN_AVI_Fig15.5_OffshoreHelidecks_v1

Search and Rescue

15.5.38 There are ten SAR helicopter bases around the UK with Bristow Group providing helicopters and aircrew. The nearest SAR base to the Aspen Array Area is at Inverness Airport located 216 km to the west.

Meteorological Facilities

15.5.39 The closed Met Office radar to the Aspen Array Area is at Hill of Dudwick, located 102.3 km to the south-west of the Aspen Array Area. RLoS analysis indicates that WTGs with a maximum blade tip height of 310 m within the Aspen Array Area will be within RLoS of the Hill of Dudwick. Although the Aspen Array Area is located outside of the 20 km safeguarded zone established around weather radars, consultation with the Met Office will confirm whether there will be any impact to the Hill of Dudwick.

Future Baseline Conditions

15.5.40 In line with the EIA Regulations, this EIAR requires a *"description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the Project as far as natural changes from the baseline scenario can be assessed with reasonable effort, on the basis of the availability of environmental information and scientific knowledge".* This reflects how the baseline relevant to military and civil aviation is expected to evolve without the Proposed Development.

15.5.41 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 military and civil aviation baseline described above.

15.5.42 As oil and gas infrastructure is decommissioned, this will potentially reduce the volume of helicopter traffic to and from offshore platforms. However, this may be offset by the traffic associated with offshore wind developments. An increase in low-level autonomous drone traffic can also be foreseen.

In Combination Climate Impacts

15.5.43 Due to the nature of this topic, the receptors assessed within this chapter are not considered to be directly sensitive to climatic changes. The only receptor which may contribute to climatic change is the use of aircraft through the emission of greenhouse gasses. Impacts on aviation receptors are unlikely to impact the volume of air traffic within the study area, an assessment of climate change has therefore not been carried out.

Data Limitations and Assumptions

15.5.44 No overarching assumptions or limitations have been identified that apply to the assessment for military and civil aviation. The data used are the most up to date publicly available information which can be obtained from the applicable data sources as cited. The data employed in the assessment are considered robust and sufficient for purpose.

15.6 Military and Civil Aviation Assessment Methodology

15.6.1 Assessment of effects in this Chapter will follow the general approach outlined in **Volume 1, Chapter 4: Environmental Impact Assessment Methodology** of the Offshore EIAR.

15.6.2 Military and civil aviation specific assessment criteria and recognised guidance on assessing military and civil aviation are provided below.

Guidance

15.6.3 In addition to the general approach and guidance outlined in **Volume 1, Chapter 4: Environmental Impact Assessment Methodology**, the military and civil aviation assessment also considers the guidance documents presented in paragraph 15.3.3.

Criteria for Assessment

15.6.4 The process for determining the likely significance of effects is a two-stage process that involves defining the magnitude of the potential impacts and the sensitivity of the receptors. This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts and the sensitivity of the receptors.

15.6.5 The terms used to define impact magnitude and receptor sensitivity for military and civil aviation are based on those described in further detail in **Volume 1, Chapter 4: Environmental Impact Assessment Methodology** of the Offshore EIAR.

Magnitude

15.6.6 The magnitude criteria for military and civil aviation are provided in Table 15.5 and are based upon the technical expert's experience and judgement. In determining magnitude, each assessment considered the spatial extent, duration, frequency, and reversibility of impact and these are outlined within the magnitude section of each assessment of impact (e.g., a duration of hours or days would be considered for most receptors to be of short-term duration, which is likely to result in a low magnitude of impact).

Table 15.5 Impact Magnitude Criteria for Military and Civil Aviation

Magnitude Value	Description
Negligible	Very slight change from baseline condition and/or physical extent of impact is negligible and/or short-term duration (i.e. less than two years) and/or frequency of repetition is negligible to continuous and/or effect is reversible.
Low	Minor shift away from baseline, leading to a reduction in level of activity that may be undertaken and/or physical extent of impact is low and/or short to medium term duration (i.e. construction period) and/or frequency of repetition is low to continuous and/or effect is not reversible for Proposed Development phase.
Medium	Loss or alteration to significant portions of key components of current activity and/or physical extent of impact is moderate and/or medium-term duration (i.e. operational period) and/or frequency of repetition is medium to continuous and/or effect is not reversible for Proposed Development phase.

Magnitude Value	Description
High	Total loss of ability to carry on activities and/or impact is of extended physical extent and/or long-term duration (i.e. total life of Proposed Development) and/or frequency of repetition is continuous and/or effect is not reversible for Proposed Development.

Sensitivity

15.6.7 The sensitivity criteria for military and civil aviation receptors are provided in Table 15.6.

Table 15.6 Receptor Sensitivity Criteria for Military and Civil Aviation

Sensitivity Value	Description
Negligible	Receptor, or the activities of the receptor, is of negligible value to the local, regional or national economy and/or the receptor or the activities of the receptor, is not vulnerable to impacts that may arise from the Proposed Development and/or has high recoverability.
Low	Receptor, or the activities of the receptor, is of low value to the local, regional or national economy and/or the receptor or the activities of the receptor, is not generally vulnerable to impacts that may arise from the Proposed Development and/or has high recoverability.
Medium	Receptor, or the activities of the receptor, is of moderate value to the local, regional or national economy and/or the receptor or the activities of the receptor, is somewhat vulnerable to impacts that may arise from the Proposed Development and/or has moderate to high levels of recoverability.
High	Receptor, or the activities of the receptor, is of high value to the local, regional or national economy and/or the receptor or the activities of the receptor, is generally vulnerable to impacts that may arise from the Proposed Development and/or recoverability is slow and/or costly.

15.6.8 By assigning and combining magnitude and sensitivity criteria, overall effect significance upon military and civil aviation receptors can be determined (Table 15.7).

Table 15.7 Matrix Used for the Assessment of Significance of the Effect

Sensitivity of Receptor	Magnitude of Impact: Negligible	Low	Medium	High
Negligible	Negligible	Negligible	Negligible	Negligible
Low	Negligible	Minor	Minor	Minor
Medium	Negligible	Minor	Moderate	Moderate
High	Minor	Minor	Moderate	Major

15.6.9 A level of effect of moderate or more will be considered a 'significant' effect for the purpose of the EIA. A level of effect of minor or less will be considered 'not significant'.

Embedded Commitments

15.6.10 As part of the project design process, several designed-in measures have been proposed to reduce the potential for impacts on environmental receptors. As there is a commitment to implementing these measures, they are considered inherently part of the design of the Proposed Development and have therefore been considered in the assessment (i.e., the determination of magnitude and therefore significance assumes implementation of these measures). These measures are considered standard industry practice for this type of development. The embedded commitments relevant to military and civil aviation are presented in Table 15.8. **Volume 3, Appendix 4.2: Commitments Register**, provides additional information on how these commitments are secured.

15.6.1 In accordance with the Institute of Environmental Management and Assessment Guide to Delivering Quality Development (IEMA 2016), embedded commitments are described using the following classifications:

- Primary mitigation – embedded commitments built into the design of the Proposed Development which reduce or avoid the likelihood or magnitude of an adverse environmental effect, including location or design (also referred to Embedded Mitigation);
- Secondary mitigation – additional measures implemented to further reduce environmental effects to 'not significant' levels (where appropriate) and do not form part of the fundamental design of the Proposed Development; and
- Tertiary mitigation – commitments that are required through standard practice or to meet legislative requirements and are independent of any EIA assessment.

15.6.2 The embedded commitments (C-OFF-05, C-OFF-08, C-OFF-11, C-OFF-26, C-OFF-29, C-OFF-30, C-OFF-46, and C-OFF-51) collectively aim to mitigate the impact of offshore infrastructure on military and civil aviation. WTGs and other offshore infrastructure will create an aviation obstacle environment. Marking of obstacles on aeronautical charts (C-OFF-29) and lighting of obstacles (C-OFF-29, C-OFF-46, and C-OFF-51) will make all pilots aware of the new infrastructure in the Aspen Array Area. The layout plan (C-OFF-05) and compliance with MGN 654 (MCA, 2021) and applicable annex (C-OFF-26) will address SAR requirements throughout all phases of the Project. A Decommissioning Programme (DP) will ensure that any measures required for military and civil aviation receptors are considered.

Table 15.8 Embedded Commitment Measures of Relevance to Military and Civil Aviation

Code	Commitment	Commitment Type	How Commitment is Secured
C-OFF-05	Development of and adherence to a Development Specification and Layout Plan (DSLP). The DSLP will confirm layout and relevant design parameters.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the DSLP.
C-OFF-08	Development of and adherence to a DSLP. The DSLP will confirm layout and relevant design parameters.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Construction Programme (CoP).
C-OFF-11	Development of and adherence to a Decommissioning Programme (DP). The DP will outline measures for the decommissioning of the Proposed Development.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Decommissioning Programme.
C-OFF-26	Compliance with Maritime and Coastguard Agency (MCA), MGN 654 (MCA, 2021) and its annexes where applicable (including consideration of a SAR checklist, an Emergency Response and Cooperation Plan (ERCoP) and Under Keel Clearance. Consideration will also be given to MGN 654 SAR Annex 5 (MCA, 2024).	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Cable Plan, Construction Method Statement and DSLP.
C-OFF-29	Aids to navigation (marking and lighting) will be deployed in accordance with the latest relevant available standard industry guidance and as advised by Northern Lighthouse Board (NLB), MCA and Civil Aviation Authority (CAA) and MoD as appropriate. This will include a buoyed construction area around the array area in consultation with NLB.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Navigational Safety Plan (NSP) and Lighting and Marking Plan (LMP).
C-OFF-30	Appropriate marking of the Proposed Development on Admiralty and aeronautical charts. This will include provision of the positions and heights of	Tertiary	Secured through Section 36 and/or Marine Licence

Code	Commitment	Commitment Type	How Commitment is Secured
	structures to the UK Hydrographic Office (UKHO), Civil Aviation Authority (CAA), MoD and Defence Geographic Centre (DGC).		conditions. Details provided in the NSP and LMP.
C-OFF-46	Development of and adherence to a LMP. The LMP will confirm compliance with legal requirements with regards to shipping, navigation and aviation marking and lighting.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the LMP.
C-OFF-51	Lighting and marking failures appropriately reported/rectified as soon as possible and interim hazard warnings put in place as required.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the LMP.
C-OFF-55	Development of and adherence to an Emergency Response Cooperation Plan (ERCoP) to identify measures in place to support emergency response. Prepared in line with Marine Coastguard Agency guidance.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Emergency Response Cooperation Plan.
C-OFF-60	WTGs will not rotate during towing and towing speed will not exceed 10 knots.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Construction Method Statement.

Impacts Scoped out of the Assessment

15.6.3 The impacts that have been scoped out of this military and civil aviation assessment are presented in Table 15.9.

15.6.4 Relevant stakeholder consultation (section 15.4), the Aspen Offshore Wind Farm Offshore Scoping Report (**Volume 3, Appendix 6.1: Offshore Scoping Report**), the Aspen Offshore Wind Farm Offshore Scoping Opinion (**Volume 3, Appendix 6.2: Offshore Scoping Opinion**), along with an understanding of the worst-case design scenarios and environmental baseline conditions has informed the decision to scope these impacts out for further consideration in the EIA for military and civil aviation.

Table 15.9 Impacts Scoped out of the Military and Civil Aviation Assessment

Impact Scoped Out	Justification
Construction	
Impacts on civil and military PSRs	To discriminate wanted aircraft targets from unwanted clutter, PSRs ignore static objects and only display moving targets. PSRs that can see the rotating blades of WTGs can mistake them for aircraft and so present them on the radar display as clutter. Until WTG blades in RLoS are allowed to rotate, they will not generate PSR clutter. Similarly, tall construction vessels and cranes, and WTGs under tow from Ardersier Port to the Aspen Array Area that are in RLoS will not be moving fast enough to generate PSR clutter provided they do not exceed a speed of 10 knots.
Impacts on civil and military SSRs	NATS do not consider the impact of WTGs on SSR to be material or relevant for WTGs that are beyond approximately 28 km from their SSR facilities. Furthermore, CAP 764 states that WTG effects on SSR *"…are typically only a consideration when the turbines are located very close to the SSR i.e., less than 10 km"*. The nearest SSR facility, at Allanshill, is 103.6 km from the Aspen Array Area and will not be adversely impacted by WTGs. The TOPA produced by NATS and scoping response from the MOD identified no impact on SSR.
Impact on WAM systems	The distributed nature of WAM antennas means they are resilient to interference from turbines. During consultation, NATS Safeguarding stated that the nearest offshore WAM antenna to the Aspen Array Area is located over 20 km away and they "…likely won't have any concerns in relation to these" (email March 2024, as detailed in Table 15.3). The TOPA produced by NATS identified no impact on WAM systems.

Impact Scoped Out	Justification
Impacts on weather radar	The closest Met Office weather radar is the Hill of Dudwick, located 102 km to the south-west of the Aspen Array Area. Rotating WTGs that are in RLoS and in the beam of a weather radar can have an adverse impact. At a distance of 102 km, WTGs with a maximum tip height of 310 m AMSL within the Aspen Array Area should not be within the lowest elevation scan of the radar. During the construction phase WTGs will not be rotating at operational speeds and therefore not impact the Hill of Dudwick weather radar.
Impacts on MOD PEXAs	There are no military PEXAs which overlap the Aspen Array Area. Within their scoping opinion, the MOD agreed that the Proposed Development is located outside any military PEXAs. Providing the towing route of WTGs from Ardersier Port avoids low lying military danger areas, and timings and locations of the route are provided to the MOD, there will be no impact to PEXAs.
Impacts from OTC	The OTC will be below surface level and will have no impact on aviation activities. Surface vessels will not generate any PSR clutter.
O&M	
Impacts on civil and military SSRs	NATS do not consider the impact of WTGs on SSR to be material or relevant for WTGs that are beyond approximately 28 km from their SSR facilities. Furthermore, CAP 764 states that WTG effects on SSR *"…are typically only a consideration when the turbines are located very close to the SSR i.e., less than 10 km"*. The nearest SSR facility, at Allanshill, is 103.6 km from the Aspen Array Area and will not be adversely impacted by WTGs. The TOPA produced by NATS and scoping response from the MOD identified no impact on SSR.
Impact to WAM systems	The distributed nature of WAM antennas means they are resilient to interference from turbines. During consultation, NATS Safeguarding stated that the nearest offshore WAM antenna to the Aspen Array Area is located over 20 km away and they "…likely won't have any concerns in relation to these" (email March 2024, as detailed in Table 15.3). The TOPA produced by NATS identified no impact on WAM systems.
Impacts on weather radars	The closest Met Office weather radar is the Hill of Dudwick, located 102 km to the south-west of the Aspen Array Area. WTGs that are in RLoS

Impact Scoped Out	Justification
	and in the beam of a weather radar can have an adverse impact. At a distance of 102 km, WTGs with a maximum tip height of 310 m AMSL within the Aspen Array Area should not be within the lowest elevation scan of the radar. Consultation with the Met Office will confirm whether there will be an impact to the Hill of Dudwick.
Impacts on MOD PEXAs	There are no military PEXAs overlapping the Aspen Array Area. Within their scoping opinion, the MOD agreed that the Proposed Development is located outside any military PEXAs.
Impacts from the OTC	The OTC will be below surface level and will have no impact on aviation activities. Surface vessels will not generate any PSR clutter.
Decommissioning	
Creation of an aviation obstacle environment	During the decommissioning phase the existing WTGs will be gradually dismantled and therefore the aviation obstacle environment will be removed. No specific decommissioning impacts are foreseen above those present in the construction and operation and maintenance phases.
Impact on civil and military PSRs	During the decommissioning phase the blades of WTGs will cease rotating, therefore the impact on PSRs will gradually reduce until the last WTG ceases operation. Any mitigations will remain in place until the blades of the last WTG stop rotating. There will be no other specific impacts on PSRs during decommissioning. Details regarding the towing of WTGs to a decommissioning port are currently unknown. However, providing WTGs do not exceed a speed of 10 knots, the towing of WTGs should not generate clutter on PSR systems.
Impacts on civil and military SSRs	NATS do not consider the impact of WTGs on SSR to be material or relevant for WTGs that are beyond approximately 28 km from their SSR facilities. Furthermore, CAP 764 states that WTG effects on SSR *"…are typically only a consideration when the turbines are located very close to the SSR i.e., less than 10 km"*. The nearest SSR facility, at Allanshill, is 103.6 km from the Aspen Array Area and will not be adversely impacted by WTGs. The TOPA produced by NATS and scoping response from the MOD identified no impact on SSR.

Impact Scoped Out	Justification
Impact to WAM systems	The distributed nature of WAM antennas means they are resilient to interference from turbines. During consultation, NATS Safeguarding stated that the nearest offshore WAM antenna to the Aspen Array Area is located over 20 km away and they "…likely won't have any concerns in relation to these" (email March 2024, as detailed in Table 15.3). The TOPA produced by NATS identified no impact on WAM systems.
Impacts on weather radars	The closest Met Office radar is at the Hill of Dudwick, located 102 km to the south-west of the Aspen Array Area. During the decommissioning phase, WTGs will cease rotation, therefore any potential impact on weather radars will gradually be reduced until the last WTG ceases operation.
Impacts on MOD PEXAs	There are no military PEXAs overlapping the Aspen Array Area. Within their scoping opinion, the MOD agreed that the Proposed Development is located outside any military PEXAs.
Impacts from the OTCs	The OTCs will be below surface level and will have no impact on aviation activities. Surface vessels will not generate any PSR clutter.

15.6.5 The Applicant has adopted a design envelope approach to impact assessment (also known as a 'Rochdale Envelope'). In line with guidance from the Scottish Government (2022), the design envelope approach offers flexibility in the EIA process by enabling impact assessment to be carried out against several potential design options.

15.6.6 The assessment of military and civil aviation impacts has been undertaken with respect to the details provided in **Volume 1, Chapter 3: Project Description**. A reasonable worst-case design scenario has been selected for each impact which would lead to the greatest impact for all receptors or receptor groups, when selected from a range of values. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within **Volume 1, Chapter 3: Project Description** (e.g., different infrastructure layout), to that assessed here, be taken forward in the final design scheme.

15.6.7 Table 15.10 presents the worst-case design scenario for each impact associated with LSE assessment on military and civil aviation, along with justification.

Table 15.10 Worst-case Design Scenarios with Respect to the Military and Civil Aviation Assessment

Impact	Embedded Commitment	Worst-case Design Scenario	Justification
Construction			
Impact 1: Creation of an aviation obstacle environment	C-OFF-05, C-OFF-26, C-OFF-29, C-OFF-30, C-OFF-46, C-OFF-51, and C-OFF-55.	Maximum of 72 WTGs with a maximum tip height of 310 m AMSL. Maximum of three offshore substation platforms with a maximum topside height of 70 m above Lowest Astronomical Tide (LAT) (including crane antennas, helideck and lighting). Heavy Lift Vessel (HLV) equipped with a high crane. Impact starting from a point of zero infrastructure to full presence over a construction period of up to four years.	Maximum physical obstruction to aviation operations due to the size and number of above sea level infrastructure within the Aspen Array Area.
Impact 2: Increased air traffic in the area related to wind farm activities	C-OFF-05, C-OFF-26, C-OFF-29, C-OFF-30, C-OFF-46, C-OFF-51, and C-OFF-55.	Up to 208 crew transfers to vessels or Offshore Electrical Platform(s) (OSP(s)) per year during the four year construction period.	Maximum number of helicopter trips because of being engaged in works on the Proposed Development causing increased probability of aircraft-to-aircraft collision.
O&M			
Impact 3: Creation of an aviation obstacle environment	C-OFF-05, C-OFF-26, C-OFF-29, C-OFF-30, C-OFF-46, C-OFF-51, and C-OFF-55.	Maximum of 72 WTGs with a maximum tip height of 310 m AMSL. Maximum of three offshore substation platforms with a maximum topside height of 70 m above LAT **(including crane antennas, helideck and lighting)**. HLV equipped with a high crane. Impact present during anticipated O&M period of 35 years.	Maximum physical obstruction to aviation operations due to the size and number of above sea level infrastructure within the Aspen Array Area.
Impact 4: Increased air traffic in the area related to wind farm activities	C-OFF-05, C-OFF-26, C-OFF-29, C-OFF-30, C-OFF-46, C-OFF-51, and C-OFF-55.	-	Maximum number of helicopter trips because of being engaged in works on the Proposed Development causing increased probability of aircraft-to-aircraft collision.
Impact 5: Impact on NATS Allanshill and RRH Buchan	-	Maximum of 72 WTGs with a maximum tip height of 310 m AMSL.	These parameters represent the worst-case for height of infrastructure within the Aspen Array Area which has the greatest potential for interference with radar systems.
Decommissioning			
Impact 6: Increased air traffic in the area related to wind farm activities	C-OFF-05, C-OFF-26, C-OFF-29, C-OFF-30, C-OFF-46, C-OFF-51, and C-OFF-55.	-	Maximum number of helicopter trips because of being engaged in works on the Proposed Development causing increased probability of aircraft-to-aircraft collision.

15.7 Assessment of Likely Significant Effects

15.7.1 Assessment of LSE on military and civil aviation has been undertaken for all phases of the Proposed Development. A detailed description of each impact, informed by **Volume 1, Chapter 3: Project Description**, baseline information and various analytical methods including modelling is provided below.

Construction Phase

Impact 1: Creation of an Aviation Obstacle Environment

15.7.2 Construction of the wind farm will involve tall HLVs and the installation of infrastructure above sea level which may pose a physical obstruction to low flying aircraft, increasing the risk of collision or requiring aircraft to fly extended routes to avoid obstacles. From a starting point of no infrastructure within the Aspen Array Area, to the infrastructure outlined in Table 15.10 over the four -year construction period.

15.7.3 WTGs will be constructed at Ardersier Port. Once constructed, WTGs will be towed one at a time to the Aspen Array Area. Although the towage route has not yet been defined, aviation receptors may be impacted along the coastline ranging from Inverness Airport to Aberdeen International Airport.

15.7.4 Ardersier Port is within close proximity to Inverness Airport and RAF Lossiemouth situated 6.6 km to the south south-west and 41.3 km to the east north-east respectively. The construction of WTGs at Ardersier Port may impact IFPs established at Inverness Airport and RAF Lossiemouth, therefore IFP assessments may be required.

15.7.5 The construction of WTGs may also impact Obstacle Limitation Surfaces (OLS) established at Inverness Airport. A physical safeguarding assessment may be required.

15.7.6 The towing route may also overlap the OLS established at Inverness Airport, RAF Lossiemouth, and Aberdeen International Airport.

15.7.7 Specifically, permanent or temporary obstacles may increase collision risk for:

- General military low flying training and operations;
- IFPs at RAF Lossiemouth, Aberdeen International Airport, and Inverness Airport;
- OLS at RAF Lossiemouth, Aberdeen International Airport, and Inverness Airport;
- Helicopters traffic utilising HMRIs 068, 071, 074, and 077; and
- Other offshore fixed-wing helicopter operations, including those undertaking SAR operations over the North Sea.

15.7.8 As detailed in Table 15.8, potential impacts on low flying aircraft in the vicinity of the Aspen Array Area will be mitigated through the development of an LMP in agreement with key aviation stakeholders, and through the provision of the positions and heights of structures to the CAA, MOD and DGC to enable appropriate marking on aeronautical charts. The movement of WTGs from Ardersier Port to the Aspen Array Area will also be notified to enable promulgation to key aviation stakeholders. The LMP will cover the lighting and marking of construction equipment such as tall cranes.

15.7.9 Lighting of WTGs will consider MOD and SAR requirements, and the final WTG layout will be compatible with SAR helicopter operations. An ERCoP will be developed and implemented for all phases of the Proposed Development.

15.7.10 Helicopters utilising HMRIs that route over the Aspen Array Area must remain at least 1,000 ft vertically clear of obstacles when flying IFR and 500 ft clear when flying VFR. Assuming a maximum WTG tip height of 310 m (1,017 ft) AMSL, this equates to helicopter minimum altitudes of 2,100 ft (IFR) and 1,600 ft (VFR). HMRIs are typically flown at altitudes between 1,500 ft and FL 85 (approximately 8,500 ft AMSL); however, helicopters may occasionally be required to operate below 1,500 ft to avoid icing conditions. Under these conditions, helicopters with limited icing capability may be unable to overfly the Aspen Array Area, restricting the available HMRIs and requiring them to fly an extended route to their destination.

15.7.11 CAP 764 (CAA, 2016) states that for the purposes of transiting wind farm developments under VFR, corridors may be established that are no less than 1 nm (1,852 m) wide. Discussion with NATS and helicopter operators is required to determine whether such mitigation is required or appropriate. The DSLP will confirm the layout of WTGs, taking into account any such mitigation requirements and will also ensure compatibility with possible SAR helicopter operations within the Aspen Array Area.

15.7.12 WTGs towed from port to the Aspen Array Area will create a temporary aviation obstacle environment along the towing route. A Notice to Aviation (NOTAM) will be raised to make pilots and aerodromes such as Aberdeen International Airport aware of the temporary obstacle environment.

15.7.13 The impact is considered to be of local spatial extent (i.e., limited to the military and civil aviation study area), short to medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be low.

Sensitivity of Receptor

15.7.14 Embedded commitment measures with respect to notification, charting, marking and lighting will make all pilots aware of the addition of infrastructure to the Aspen Array Area, and it is assumed that pilots will comply with aviation regulatory requirements. The ultimate responsibility for seeing and avoiding obstacles rests with captains of civilian and military aircraft. Under the Standardised Rules of the Air Regulation (CAA, 2024) helicopters (like all aircraft) are required to avoid all structures, such as WTGs, by a minimum distance of 500 ft.

15.7.15 Military low flying and SAR and other offshore helicopter operations are deemed to be low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be medium.

Significance of Effect

15.7.16 The magnitude of the impact is deemed to be low, and the sensitivity of the receptor is medium. The effects will therefore be of minor significance, which is not significant in EIA terms.

15.7.17 A summary of the impact magnitude, receptor sensitivity and significance of effect for military and civil aviation receptors is presented in Table 15.11.

Table 15.11 Significance of Impact 1: Creation of an Aviation Obstacle Environment

Receptor/Location	Magnitude	Sensitivity	Significance
Military low flying, offshore helicopters, SAR operations	Low	Medium	Minor

Secondary Mitigation and Residual Effect

15.7.18 No additional military and civil aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond commitments outlined in Table 15.8) is not significant in EIA terms.

Impact 2: Increased Air Traffic in the Area Related to Wind Farm Activities

15.7.19 The construction of the wind farm will see a maximum of 208 crew transfer by helicopter to vessels or OSPs per year assuming 2 weekly crew changes for 26 weeks per year. A four year construction period is assumed.

15.7.20 The possible increase in air traffic associated with the construction phase brings with it a potential increased possibility of aircraft collision in airspace around the Proposed Development.

Magnitude of Impact

15.7.21 The predicted helicopter movements during the construction phase will be managed by existing ATS infrastructure provided in accordance with national procedures, and pilots will be expected to operate in accordance with regulatory requirements.

15.7.22 The impact is predicted to be of local spatial extent (i.e., limited to the military and civil aviation study area), short to medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be low.

Sensitivity of Receptor

15.7.23 Helicopter support operations and existing air traffic are deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be medium.

Significance of Effect

15.7.24 The magnitude of this impact is deemed to be low, and the sensitivity of the receptor is medium. The effect will therefore be of minor significance, which is not significant in EIA terms.

Table 15.12 Significance of Impact 2: Increased Air Traffic in the Area Related to Wind Farm Activities

Receptor/Location	Magnitude	Sensitivity	Significance
Helicopter support operations / existing air traffic.	Low	Medium	Minor

Secondary Mitigation and Residual Effect

15.7.25 No additional military and civil aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond commitments outlined in Table 15.8) is not significant in EIA terms.

Operation and Maintenance

Impact 3: Creation of an Aviation Obstacle Environment

15.7.26 During the O&M phase, the infrastructure outlined in Table 15.10 will be present within the Aspen Array Area. This may pose a physical obstruction to aircraft utilising the airspace in the vicinity of the Proposed Development.

15.7.27 Specifically, permanent or temporary obstacles may increase collision risk for:

- General military low flying training and operations;
- Helicopters traffic utilising HMRIs 068, 071, 074, and 077; and
- Other offshore fixed-wing helicopter operations, including those undertaking SAR operations over the North Sea.

Magnitude of Impact

15.7.28 As detailed in Table 15.8, potential impacts on low flying aircraft in the vicinity of the Aspen Array Area will be mitigated through the development of an LMP in agreement with key aviation stakeholders, and through the provision of the positions and heights of structures to the CAA, MOD and DGC to enable appropriate marking on aeronautical charts.

15.7.29 Lighting of WTG will consider the MOD and SAR requirements, and the final WTG layout will be compatible with SAR helicopter operations. An ERCoP will be developed and implemented for all phases of the Proposed Development.

15.7.30 Helicopters utilising HMRIs that route over the Aspen Array Area must remain at least 1,000 ft vertically clear of obstacles when flying IFR and 500 ft clear when flying VFR. Assuming a maximum WTG tip height of 310 m (1,017 ft) AMSL, this equates to helicopter minimum altitudes of 2,100 ft (IFR) and 1,600 ft (VFR). HMRIs are typically flown at altitudes between 1,500 ft and FL 85 (approximately 8,500 ft AMSL); however, helicopters may occasionally be required to operate below 1,500 ft to avoid icing conditions. Under these conditions, helicopters with limited icing capability may be unable to overfly the Aspen Array Area, restricting the available HMRIs and requiring them to fly an extended route to their destination.

15.7.31 CAP 764 (CAA, 2016) states that for the purposes of transiting wind farm developments under VFR, corridors may be established that are no less than 1 nm (1,852 m) wide. Discussion with NATS and helicopter operators is required to determine whether such mitigation is required or appropriate. The DSLP will confirm the layout of WTGs, taking into account any such mitigation requirements and will also ensure compatibility with possible SAR helicopter operations within the Aspen Array Area.

15.7.32 The impact is considered to be of local spatial extent (i.e., limited to the military and civil aviation study area), medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be low.

Sensitivity of Receptor

15.7.33 Embedded commitment measures with respect to notification, charting, marking and lighting will make all pilots aware of the additional infrastructure to the Aspen Array Area, and it is assumed that pilots will comply with aviation regulatory requirements. The ultimate responsibility for seeing and avoiding obstacles rests with captains of civilian and military aircraft. Under the Standardised Rules of the Air Regulation (CAA, 2024) helicopters (like all aircraft) are required to avoid all structures, such as WTGs, by a minimum distance of 500 ft.

15.7.34 Military low flying and SAR and other offshore helicopter operations are deemed to be low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be medium.

Significance of Effect

15.7.35 The magnitude of the impact is deemed to be low, and the sensitivity of the receptor is medium. The effect will, therefore, be of minor significance, which is not significant in EIA terms.

Table 15.13 Significance of Impact 3: Creation of an Aviation Obstacle Environment

Receptor/Location	Magnitude	Sensitivity	Significance
Military low flying, offshore helicopters, SAR operations.	Low	Medium	Minor

Secondary Mitigation and Residual Effect

15.7.36 No additional military and civil aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the commitments outlined in Table 15.8) is not significant in EIA terms.

Impact 4: Increased Air Traffic in the Area Related to Wind Farm Activities

15.7.37 The O&M phase will likely see an increase in helicopter traffic above the current baseline level engaged in works on the Proposed Development.

15.7.38 The possible increase in air traffic associated with support activities brings with it a potential increased possibility of aircraft collision in the airspace around the Proposed Development.

Magnitude of Impact

15.7.39 The predicted increase of helicopter movements during the O&M phase will be managed by the existing ATS infrastructure provided in accordance with national procedures, and pilots will be expected to operate in accordance with the regulatory requirements.

15.7.40 The impact is predicted to be of local spatial extent (i.e. limited to the military and civil aviation study area), medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be low.

Sensitivity of Receptor

15.7.41 Helicopter support operations and existing air traffic are deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be medium.

Significance of Effect

15.7.42 The magnitude of the impact is deemed to be low, and the sensitivity of the receptor is medium. The effect will therefore be of minor significance, which is not significant in EIA terms.

Table 15.14 Significance of Impact 4: Increased Air Traffic Related to Wind Farm Activities

Receptor/Location	Magnitude	Sensitivity	Significance
Helicopter support operations / existing air traffic.	Low	Medium	Minor

Secondary Mitigation and Residual Effect

15.7.43 No additional military and civil aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the commitments outlined in Table 15.8) is not significant in EIA terms.

Impact 5: Impact on NATS Allanshill and RRH Buchan

15.7.44 The Aspen Array Area will be within operational range of radar systems serving both civil and military agencies. Radar modelling detailed in **Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report** shows that WTGs with a blade tip height of 310 m AMSL within the Aspen Array Area will be theoretically detectable by the NATS PSR at Allanshill and the MOD AD PSR at RRH Buchan.

Magnitude of Impact

15.7.45 When operational (in other words, with blades fitted and rotating), WTGs have the potential to generate 'clutter' (or false targets) upon radar displays because current generation PSRs cannot easily differentiate between the moving blades of WTGs and aircraft. As a consequence, radar operators may be unable to distinguish between primary radar returns generated by WTGs and those generated by aircraft. As a general rule, controllers are required to provide 5 nm (9.3 km) lateral separation between traffic receiving an ATS and 'unknown' primary radar returns in Class G airspace. This may therefore have an adverse impact on the provision of a safe and effective en-route surveillance service by controllers at NATS Prestwick Centre and other ATS providers such as Aberdeen Airport and may compromise the ability of the MOD to undertake its AD role.

15.7.46 The impact is predicted to be of local spatial extent (i.e. limited to the Aspen Array Area), medium term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be high.

Sensitivity of Receptor

15.7.47 During pre-scoping consultation, NATS stated that WTGs within the western section of the Aspen Array Area will be within RLoS to the PSR at Allanshill. RLoS analysis conducted as part of **Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report** for WTGs with a maximum tip height of 310 m AMSL confirms this statement. As part of their consultation response, NATS produced a TOPA which confirmed that the Proposed Development is likely to cause false primary plots to be generated for Allanshill and reduce the PSR's probability of detection for real aircraft. The TOPA continues to state that the scale of the area affected by the predicted clutter would lead to an unacceptable impact on en-route traffic operations at NATS Prestwick ATC Centre and Aberdeen ATC.

15.7.48 Within their scoping response the MOD stated that they agree with the impact to identified to RRH Buchan in Table 15.3 of the **Volume 3, Appendix 6.1: Offshore Scoping Report**. The Scoping Report indicates WTGs within the Aspen Array Area will have the potential to impact on the operation and capability of the Buchan AD radar system.

15.7.49 PSRs are deemed to be of high vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be high.

Significance of Effect

15.7.50 The magnitude of the impact is deemed to be high, and the sensitivity of the receptor is high. The effect will therefore be of major significance, which is significant in EIA terms.

Table 15.15 Significance of Impact 5: Impact on NATS Allanshill, RRH Buchan, and the Hill of Dudwick

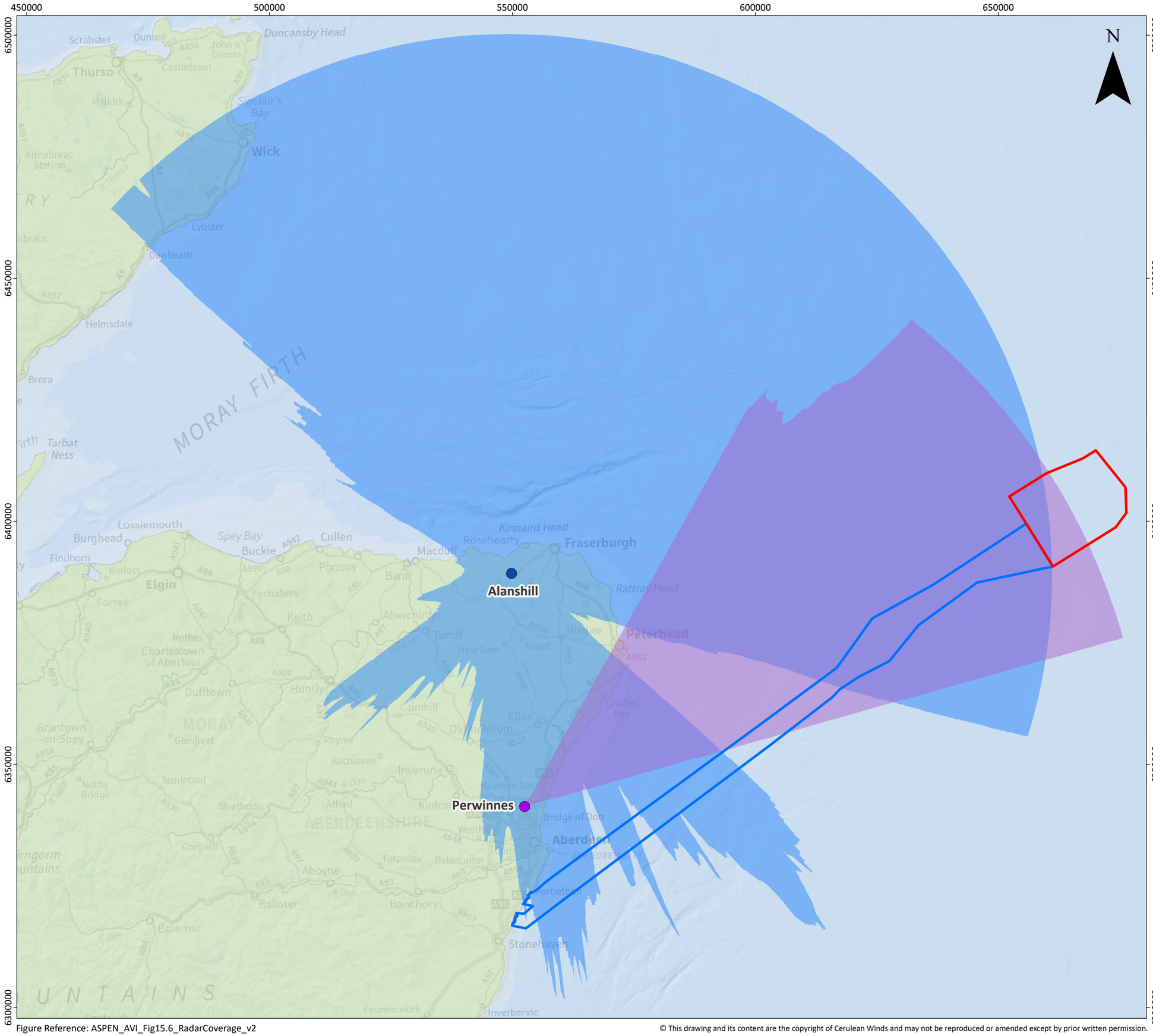
Receptor/Location	Magnitude	Sensitivity	Significance
NATS Allanshill / RRH Buchan	High	High	Major

Secondary Mitigation and Residual Effect

15.7.51 Secondary mitigation in respect of Allanshill PSR may involve:

- Blanking (not displaying radar data) over the Aspen Array Area (either at the radar head or in the radar display system) so as to remove the PSR data containing the WTG returns from the radar data presented to controllers; or
- In addition to blanking, introducing a TMZ over the Aspen Array Area which require all aircraft that wish to transit the TMZ airspace to be equipped with SSR transponders to enable controllers to track aircraft through what would otherwise be a 'black hole' in primary surveillance radar cover. Implementation of a TMZ would require the submission of an Airspace Change Proposal (ACP) to the CAA. The formal airspace change process that has to be followed is detailed in CAP 1616: Airspace Change Process (CAA, 2024).

15.7.52 Consultation with NATS will continue with the aim of delivering a suitable mitigation solution for the PSR at Allanshill prior to the O&M phase . It is common for offshore wind farms in the UK to negotiate and ultimately agree mitigation contracts with NATS. Blanking off the clutter induced area around the Aspen Array Area on radar will remove clutter. PSR coverage of the blanked area could be infilled by a non-impacted radar, NATS Perwinnes from altitudes upwards of 1,400 ft as shown in Figure 15.6.



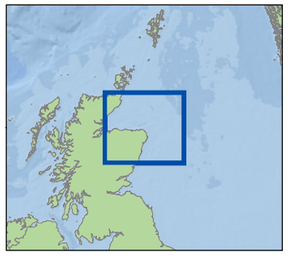
CERULEAN WINDS

Aspen Offshore Wind Farm
Environmental Impact Assessment

Radar Coverage Provided by NATS Perwinnes at 1,400 ft AMSL

Legend

- Aspen Array Area
- Offshore Transmission Cable Corridor
- NATS Radar - Perwinnes
- Perwinnes RLoS 1,400ft AMSL
- NATS Radar - Alanshill
- Allanshill 60nm RLoS 310m AMSL



Notes

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Coordinate System: WGS 1984 UTM Zone 30N

0 20 40 km

0 10 20 nm

Scale	Date	Drawn by	Checked by	Approved by
1:750,000 @A3	25/07/2025	BPHB	EM	PN

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GoBe APEMGroup

Figure 15.6

Figure Reference: ASPEN_AVI_Fig15.6_RadarCoverage_v2

15.7.53 An AD and Offshore Wind (AD&OW) Windfarm Mitigation Task Force was formed as a collaborative initiative between the MOD, what is now the Department for Energy Security and Net Zero (DESNZ), the Offshore Wind Industry Council and The Crown Estate in August 2019. The aim of the Task Force is to enable the co-existence of UK AD and offshore wind by identifying potential mitigations and supporting processes, allowing offshore wind to contribute towards meeting the UK Government's Net Zero target without degrading the nation's AD surveillance capability.

15.7.54 The AD&OW Strategy and Implementation Plan (S&IP) was published in September 2021, setting out the direction for this collaboration by identifying, assessing and deploying solutions that will enable the co-existence of AD&OW operations such that neither are unduly nor excessively compromised. The S&IP may lead to significant changes to current AD PSR characteristics and capabilities that in turn affect the potential impact that the project may have. The S&IP states that mitigation of the adverse impacts of windfarms on current AD systems will be a stepping stone towards a longer-term solution that will enable co-existence.

15.7.55 In late summer 2023, the MOD launched Project NJORD, calling for potential AD solution providers to participate in prequalification trails. Fourteen suppliers were successful, including Lockheed Martin UK Limited, Serco Limited, and Thales UK Limited. Updates as to progress on Project NJORD are not currently in the public domain. However, the Secretary of State for DESNZ noted in a speech on 17 September 2024 that AD mitigation delays have been potentially impacting deployment of offshore wind through the Contracts for Difference Allocation Rounds.

15.7.56 The Clean Energy 2030 action plan revealed the full costs of the long-term radar mitigation solutions identified by Programme NJORD will be funded via an alternative route delivered by government, and the funding requirement is therefore removed from offshore wind developers.

15.7.57 Once mitigation solutions are implemented, the magnitude of the impact is deemed to be negligible, and the sensitivity of the receptor is high. The effects will therefore be of minor significance, which is not significant in EIA terms.

Decommissioning

Impact 6: Increased Air Traffic in the Area Related to Wind Farm Activities

15.7.58 The use of helicopters to support decommissioning activities for the Proposed Development may impact on existing air traffic in the vicinity. Helicopters may be used for crew changes during the decommissioning phase.

15.7.59 The possible increase in air traffic associated with decommissioning support activities brings with it a potential increased possibility of aircraft collision in the airspace around the Proposed Development.

Magnitude of Impact

15.7.60 The predicted number of helicopter movements during the decommissioning phase will be managed by the existing ATS infrastructure provided in accordance with national procedures, and pilots will be expected to operate in accordance with regulatory requirements.

15.7.61 The impact of is predicted to be of local spatial extent (i.e. limited to the Proposed Development military and civil aviation study area), short to medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be low.

Sensitivity of the Receptor

15.7.62 Helicopter support operations and existing traffic are deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be medium.

Significance of Effect

15.7.63 The magnitude of the impact is deemed to be low, and the sensitivity of the receptor is medium. The effect will therefore be of minor significance, which is not significant in EIA terms.

Table 15.16 Significance of Impact 6: Increased Air Traffic in the Area Related to Wind Farm Activities

Receptor/Location	Magnitude	Sensitivity	Significance
Helicopter support operations / existing air traffic.	Low	Medium	Minor

Secondary Mitigation and Residual Effect

15.7.64 No additional military and civil aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the commitments outlines in Table 15.8) is not significant in EIA terms.

Proposed Monitoring

15.7.65 No monitoring relevant to military and civil aviation is considered necessary.

15.8 Cumulative Effects Assessment

Cumulative Effects Assessment Methodology

15.8.1 The effects of the Proposed Development alone are generally limited to areas near the Aspen Array Area and OTC Corridor. However, some impacts may extend over a wider area. Cumulative effects arise when the Proposed Development combines with other projects, affecting the same receptor or group of receptors.

15.8.2 **Volume 1, Chapter 4: Environmental Impact Assessment Methodology** outlines how cumulative effects will be assessed through a Cumulative Effects Assessment (CEA). A screening process has identified relevant plans, projects, and activities to be included. Figure 15.7 illustrates those relevant to military and civil aviation, with further details provided in Table 15.17.

15.8.3 The assessment uses the most up-to-date publicly available project parameters for each relevant plan or project.

15.8.4 Different plans and projects may contribute to cumulative effects to varying degrees, depending on their progress and likelihood of operation. A tiered approach is used to weight the assessment accordingly:

- Tier 1: The Proposed Development combined with projects that have become operational since the baseline characterisation, ongoing operational projects, and those consented but not yet built or under construction;
- Tier 2: All Tier 1 projects, plus those that have submitted a Scoping Report or are awaiting determination following an application; and
- Tier 3: All Tier 2 projects, plus those not yet in the planning system but expected to enter soon (e.g., Agreement for Lease (AfL) projects or those in feasibility/early design stages), where sufficient data is available.

15.8.5 The CEA for military and civil aviation considers the worst-case design scenario for each project, plan, and activity, following the methodology in **Volume 1, Chapter 4: Environmental Impact Assessment Methodology**. Projects were included in the assessment based on a screening range covering both the spatial and temporal scope of the Proposed Development, defined by construction and decommissioning timelines and study area. The screening distance is set at 100 km.

15.8.6 Assessment of potential cumulative impacts on military and civil aviation receptors has considered projects to a range of 100 km from the Aspen Array Area. This distance is the maximum range at which radar cumulative effects are considered to occur. The potential cumulative effect of radar impacts on ATC operations diminishes as the separation between wind farm sites increases. A separation distance of 100 km is considered to be a pragmatic range beyond which cumulative effects will be negligible.

15.8.7 Potential cumulative impacts on military and civil aviation receptors have been evaluated using project-specific modelling and other analytical methods.

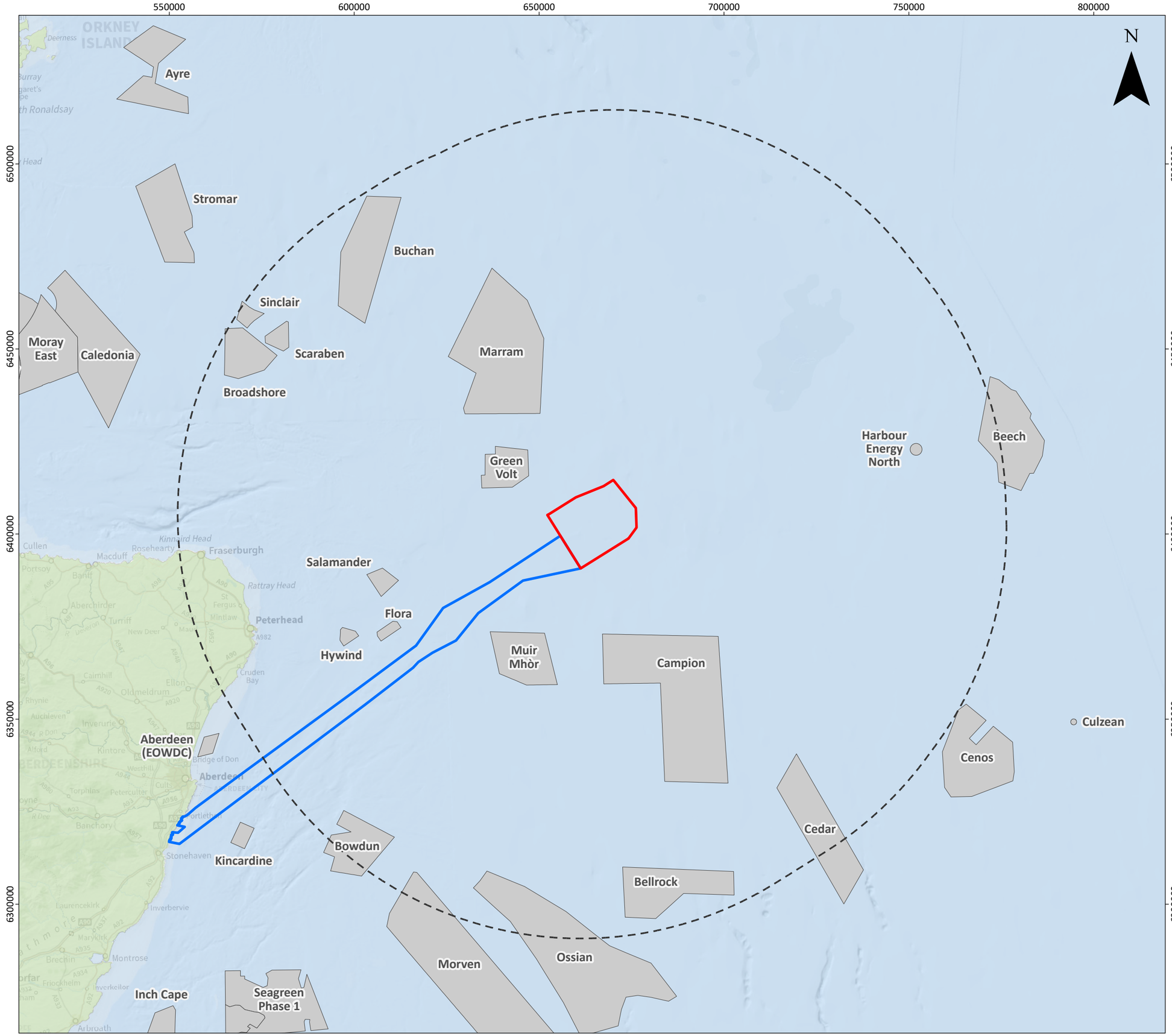


Figure Reference: ASPEN_AVI_Fig15.7_OtherProjects_v3

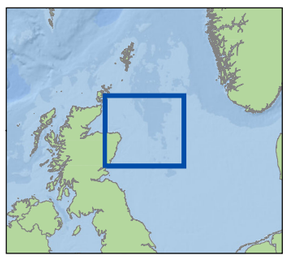
CERULEAN WINDS

Aspen Offshore Wind Farm
Environmental Impact Assessment

Other Projects Relevant to the Military and Civil Aviation CEA

Legend

- Aspen Array Area
- Offshore Transmission Cable Corridor
- 100km Offshore CEA Screening Range
- Offshore Wind Farm Projects Relevant to the CEA



Notes

Esri, Garmin, GEBCO, NOAA NGDC, and other contributors Contains Ordnance Survey data © Crown copyright and database rights (2024). OS OpenData.

Coordinate System: WGS 1984 UTM Zone 30N

0 25 50 km

0 10 20 nm

Scale	Date	Drawn by	Checked by	Approved by
1:1,000,000@A3	25/07/2025	BPHB	EM	PN

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GoBe APEMGroup

Figure 15.7

Table 15.17 Other Plans/Projects included in the Military and Civil Aviation CEA

Plan/Project	Summary	Status	Distance from Aspen Array Area (km)	Distance from OTC (km)	Construction Dates (if relevant)	Operational by (if relevant)	Summary of Interaction with Proposed Development
Tier 1							
Hywind	Offshore Wind Farm	Operational	60.58	11.34	N/A	Already Operational	Operation interacts with Construction and O&M phase of Proposed Development
Tier 2							
Green Volt	Offshore Wind Farm	Consented	11.59	18.11	2025 – 2027	2028	Operation interacts with Construction and O&M phase of Proposed Development
Muir Mhòr	Offshore Wind Farm	In planning	20.05	5.66	2030 – Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development
Salamander	Offshore Wind Farm	In Planning	43.96	14.13	2028 – 2030	2031	Operation interacts with Construction and O&M phase of Proposed Development
Ossian	Offshore Wind Farm	In Planning	85.63	55.73	2031 – Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development
Tier 3							
Campion	Offshore Wind Farm	Concept/Early Planning	18.67	18.67	Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development
Marram	Offshore Wind Farm	Concept/Early Planning	24.64	33.50	Unknown	2030	Operation interacts with Construction and O&M phase of Proposed Development
Flora	Offshore Wind Farm	Concept/Early Planning	49.68	6.16	Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development
Buchan	Offshore Wind Farm	Concept/Early Planning	71.56	77.01	2028 – 2030	2031	Operation interacts with Construction and O&M phase of Proposed Development
Cedar	Offshore Wind Farm	Concept/Early Planning	73.81	76.91	Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development

Plan/Project	Summary	Status	Distance from Aspen Array Area (km)	Distance from OTC (km)	Construction Dates (if relevant)	Operational by (if relevant)	Summary of Interaction with Proposed Development
Harbour Energy North	Offshore Wind Farm	Concept/Early Planning	75.82	94.62	Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development
Bellrock	Offshore Wind Farm	Concept/Early Planning	81.49	76.00	2028 – 2031	2032	Operation interacts with Construction and O&M phase of Proposed Development
Scaraben	Offshore Wind Farm	Concept/Early Planning	83.34	81.79	Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development
Broadshore	Offshore Wind Farm	Concept/Early Planning	84.86	80.47	2028 – 2031	2032	Operation interacts with Construction and O&M phase of Proposed Development
Bowdun	Offshore Wind Farm	Concept/Early Planning	88.38	19.43	2029 – Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development
Morven	Offshore Wind Farm	Concept/Early Planning	93.35	44.05	2027 – 2029	Unknown	Operation interacts with Construction and O&M phase of Proposed Development
Sinclair	Offshore Wind Farm	Concept/Early Planning	93.98	92.38	Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development
Beech	Offshore Wind Farm	Concept/Early Planning	94.35	112.89	2026 – 2027	2028	Operation interacts with Construction and O&M phase of Proposed Development
Cenos	Offshore Wind Farm	Concept/Early Planning	99.99	109.05	2029 – Unknown	Unknown	Operation interacts with Construction and O&M phase of Proposed Development

15.8.8 The military and civil aviation CEA has been undertaken with respect to the details provided in **Volume 1, Chapter 3: Project Description**. A worst-case design scenario has been selected for each cumulative effect which would lead to the greatest impact for all receptors or receptor groups, when selected from a range of values. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within **Volume 1, Chapter 3: Project Description** (e.g., different infrastructure layout), to that assessed here, be taken forward in the final design scheme.

15.8.9 Table 15.18 presents the worst-case design scenario for each cumulative impact associated with the military and civil aviation CEA, along with justification. The range of potential cumulative impacts identified are a subset of those considered for the Proposed Development in isolation. This is because some of these potential impacts such as the creation of an aviation obstacle environment are highly localised in nature and therefore have limited or no potential to interact with similar impacts associated with other projects. There are no military and civil aviation impacts scoped in during the decommissioning phase which may be subject to cumulative impacts from other offshore wind developments. The cumulative impacts to be assessed are identified in Table 15.18.

Table 15.18 Worst-case Design Scenarios with Respect to the Military and Civil Aviation CEA

Cumulative Impact	Tier	Worst-case Design Scenario
Construction		
Impact 7: Creation of an aviation obstacle environment	Tier 1: ▪ Hywind Tier 2: ▪ Green Volt ▪ Muir Mhòr ▪ Salamander ▪ Ossian Tier 3: ▪ Campion ▪ Marram ▪ Flora ▪ Buchan ▪ Cedar ▪ Harbour Energy North ▪ Bellrock ▪ Scaraben ▪ Broadshore ▪ Bowdun ▪ Morven ▪ Sinclair ▪ Beech ▪ Cenos	Worst-case design scenario as described for the Proposed Development (Table 15.10).
O&M		

Cumulative Impact	Tier	Worst-case Design Scenario
Impact 8: Creation of an aviation obstacle environment	Tier 1: ▪ Hywind Tier 2: ▪ Green Volt ▪ Muir Mhòr ▪ Salamander ▪ Ossian Tier 3: ▪ Campion ▪ Marram ▪ Flora ▪ Buchan ▪ Cedar ▪ Harbour Energy North ▪ Bellrock ▪ Scaraben ▪ Broadshore ▪ Bowdun ▪ Morven ▪ Sinclair ▪ Beech ▪ Cenos	Worst-case design scenario as described for the Proposed Development (Table 15.10).
Impact 9: Impact on NATS Allanshill and RRH Buchan	Tier 1: ▪ Hywind Tier 2: ▪ Green Volt ▪ Muir Mhòr ▪ Salamander ▪ Ossian Tier 3: ▪ Campion ▪ Marram ▪ Flora ▪ Buchan ▪ Cedar ▪ Harbour Energy North ▪ Bellrock ▪ Scaraben ▪ Broadshore ▪ Bowdun ▪ Morven ▪ Sinclair ▪ Beech ▪ Cenos	Worst case design scenario as described for the Proposed Development (Table 15.10).

Impact 7: Creation of an aviation obstacle environment

15.8.10 Construction of the wind farm will involve tall HLVs and the installation of infrastructure above sea level. Together with the installation of WTGs associated with other projects and other operational wind farms, this may pose a physical obstruction to low flying aircraft, increasing the risk of collision or requiring aircraft to fly extended routes to avoid obstacles. From a starting point of no infrastructure within the Aspen Array Area, to the infrastructure outlined in Table 15.10 over the four year construction period.

15.8.11 Specifically, permanent or temporary obstacles may increase collision risk for:

- General military low flying training and operations;
- Helicopters traffic utilising HMRIs; and
- Other offshore fixed-wing helicopter operations, including those undertaking SAR operations over the North Sea.

Magnitude of Cumulative Impact

15.8.12 As detailed in Table 15.8, potential impacts on low flying aircraft in the vicinity of the Aspen Array Area will be mitigated through the development of an LMP in agreement with aviation stakeholders, and through the provision of the positions and heights of structures to the CAA, MOD and DGC to enable appropriate marking on aeronautical charts.

15.8.13 Lighting of WTGs will consider MOD and SAR requirements, and the final WTG layout will be compatible with SAR helicopter operations. An ERCoP will be developed and implemented for all phases of the Proposed Development.

15.8.14 Operational wind farm projects already have suitable aviation lighting and are marked on relevant aeronautical charts to make pilots aware of their presence. Other proposed projects will have similar embedded measures as the Proposed Development.

15.8.15 Discussion with NATS and helicopter operators regarding the impacts on HMRIs should take into account the presence of other future offshore developments.

15.8.16 The cumulative impact is predicted to be of regional spatial extent, short to medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be low.

Sensitivity of Receptor

15.8.17 Embedded commitment measures with respect to notification, charting, marking and lighting will make all pilots aware of the addition of infrastructure to the Aspen Array Area, and it is assumed that pilots will comply with aviation regulatory requirements. The ultimate responsibility for seeing and avoiding obstacles rests with captains of civilian and military aircraft. Under the Standardised Rules of the Air Regulation (CAA, 2024) helicopters (like all aircraft) are required to avoid all structures, such as WTGs, by a minimum distance of 500 ft.

15.8.18 Military low flying and SAR and other offshore helicopter operations are deemed to be low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be medium.

Significance of Cumulative Effect

15.8.19 A summary of the cumulative impact magnitude, receptor sensitivity and significance of effect for military and civil aviation receptors is presented in Table 15.19.

Table 15.19 Significance of Impact 7: Creation of an Aviation Obstacle Environment

Receptor/Location	Magnitude	Sensitivity	Significance
Military low flying / offshore helicopters / SAR operators	Low	Medium	Minor

15.8.20 The magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptor is medium. The cumulative effect will therefore be of minor significance, which is not significant in EIA terms.

Secondary Mitigation and Residual Cumulative Effects

15.8.21 No additional military and civil aviation mitigation is considered necessary because the likely cumulative effect in the absence of further mitigation (beyond the commitments outlined in Table 15.8) is not significant in EIA terms.

Operation and Maintenance Cumulative Effects Assessment

Impact 8: Creation of an aviation obstacle environment

15.8.22 During the O&M phase the infrastructure outlined in Table 15.10 will be present within the Aspen Array Area. This infrastructure, together with the installation of WTGs associated with other projects and other operational wind farms may pose a physical obstruction to aircraft utilising the airspace in the vicinity of the various projects.

15.8.23 Specifically, permanent or temporary obstacles may increase collision risk for:

- General military low flying training and operations;
- Helicopter traffic utilising HMRIs;
- Other offshore fixed-wing helicopter operations, including those undertaking SAR operations over the North Sea.

Magnitude of Cumulative Impact

15.8.24 As detailed in Table 15.8, potential impacts on low flying aircraft in the vicinity of the Aspen Array Area will be mitigated through the development of an LMP in agreement with aviation stakeholders, and through the provision of the positions and heights of structures to the CAA, MOD and DGC to enable appropriate marking on aeronautical charts.

15.8.25 Lighting of WTGs will consider MOD and SAR requirements, and the final WTG layout will be compatible with SAR helicopter operations. An ERCoP will be developed and implemented for all phases of the Proposed Development.

15.8.26 Operational wind farm projects already have suitable aviation lighting and are marked on relevant aeronautical charts to make pilots aware of their presence as they would not gain consent without implementing the mitigations above. Other proposed projects will have similar embedded measures as the Proposed Development.

15.8.27 Discussion with NATS and helicopter operators regarding the impacts on HMRIs should take into account the presence of other future offshore developments.

15.8.28 The cumulative impact is predicted to be of regional spatial extent, short to medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be low.

Sensitivity of Receptor

15.8.29 Embedded commitment measures with respect to notification, charting, marking and lighting will make all pilots aware of the addition of infrastructure to the Aspen Array Area, and it is assumed that pilots will comply with aviation regulatory requirements. The ultimate responsibility for seeing and avoiding obstacles rests with captains of civilian and military aircraft. Under the Standardised Rules of the Air Regulation (CAA, 2024) helicopters (like all aircraft) are required to avoid all structures, such as WTGs, by a minimum distance of 500 ft.

15.8.30 Military low flying and SAR and other offshore helicopter operations are deemed to be low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be medium.

Significance of Cumulative Effect

15.8.31 A summary of the cumulative impact magnitude, receptor sensitivity and significance of effect for military and civil aviation receptors is presented in Table 15.20

Table 15.20 Significance of Impact 8: Creation of an Aviation Obstacle Environment

Receptor/Location	Magnitude	Sensitivity	Significance
Military low flying / offshore helicopters / SAR operators	Low	Medium	Minor

15.8.32 The magnitude of the cumulative impact is deemed to be low, the sensitivity of the receptor is medium. The cumulative effect will therefore be of minor significance, which is not significant in EIA terms.

Secondary Mitigation and Residual Cumulative Effect

15.8.33 No additional military and civil aviation mitigation is considered necessary because the likely cumulative effect in the absence of further mitigation (beyond the commitments outlined in Table 15.8) is not significant in EIA terms.

15.8.34 The Aspen Array Area will be within operational range of radar systems serving both civil and military agencies. Radar modelling detailed in **Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report** shows that WTGs with a blade tip height of 310 m AMSL within the Aspen Array Area will be theoretically detectable by the NATS PSR at Allanshill and the MOD AD PSR at RRH Buchan. Other offshore wind developments within the vicinity of the Aspen Array Area may also be detectable to NATS Allanshill and RRH Buchan.

Magnitude of Cumulative Impact

15.8.35 Radar detection of WTG blades from multiple offshore wind developments may result in a substantial increase in clutter being generated over a larger area on radar displays. This may therefore have an adverse impact on the provision of a safe and effective en-route surveillance service by controllers at NATS Prestwick Centre and other ATS providers such as Aberdeen Airport and may compromise the ability of the MOD to undertake its AD role.

15.8.36 The cumulative impact is predicted to be of regional spatial extent, long term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be high.

Sensitivity of Receptor

15.8.37 During pre-scoping consultation, NATS stated that WTGs within the western section of the Aspen Array Area will be within RLoS to the PSR at Allanshill. RLoS analysis conducted as part of **Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report** for WTGs with a maximum tip height of 310 m AMSL confirms this statement. As part of their consultation response, NATS produced a TOPA which confirmed that the Proposed Development is likely to cause false primary plots to be generated for Allanshill and reduce the PSR's probability of detection for real aircraft. The TOPA continues to state that the scale of the area affected by the predicted clutter would lead to an unacceptable impact on en-route traffic operations at NATS Prestwick ATC Centre.

15.8.38 Within their scoping response the MOD stated that they agree with the impact to identified RRH Buchan in Table 15.3 of the **Volume 3, Appendix 6.1: Offshore Scoping Report**. This report indicates WTGs within the Aspen Array Area will have the potential to impact on the operation and capability of the Buchan AD radar system.

15.8.39 PSRs are deemed to be of high vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be high.

Significance of Cumulative Effect

15.8.40 A summary of the cumulative impact magnitude, receptor sensitivity and significance of effect for military and civil aviation receptors is presented in Table 15.21.

Table 15.21 Significance of Impact 9: Impact on NATS Allanshill, RRH Buchan, and the Hill of Dudwick

Receptor/Location	Magnitude	Sensitivity	Significance
NATS Allanshill / RRH Buchan	High	High	Major

15.8.41 The magnitude of the cumulative impact is deemed to be high, and the sensitivity of the receptor is high. The cumulative effect will therefore be of major significance, which is significant in EIA terms.

Secondary Mitigation and Residual Cumulative Effect

15.8.42 It is assumed that for existing offshore wind developments within RLoS of NATS and MOD radars any required radar mitigation solutions have been implemented. Further operational offshore wind developments, including the Proposed Development, must have necessary radar mitigation solutions in place before becoming operational. With mitigation solutions implemented, the magnitude of the impact is deemed to be negligible, and the sensitivity of the receptor is high. The residual cumulative effect will, therefore, be of minor significance, which is not significant in EIA terms.

Proposed Monitoring for Cumulative Effects

15.8.43 No monitoring relevant to Military and Civil Aviation is considered necessary. Once constructed the infrastructure and therefore aviation obstacle environment is not anticipated to change until decommissioning, in which they will be towed back to the decommission. Other offshore wind farms will be responsible for mitigating against impacts to aviation receptors. Once the relevant mitigation measures highlighted above are put in place, there should be no significant cumulative effect.

15.9 Transboundary Effects

15.9.1 A transboundary effect assessment assesses the potential Military and Civil Aviation effects from the Proposed Development upon the interests of European Economic Areas (EEA States).

15.9.2 The potential impacts of WTGs on aviation are localised and the Aspen Array Area is completely within UK airspace, with the nearest Norwegian operated airspace located 173 km to the north-east of the Aspen Array Area.

15.9.3 The Proposed Development is a significant distance from the nearest adjacent Exclusive Economic Zone (EEZ) of another state and, therefore, it is considered that transboundary impacts will not occur.

15.10 Inter-related Effects

15.10.1 Inter-related effects may occur due to multiple impacts on a receptor or a group of receptors from the Proposed Development. This includes the following:

- **Project Lifecycle Effects** - Interactions between impacts across different phases of the Proposed Development i.e., interaction of impacts across construction, operation and maintenance and decommissioning; and

- **Inter-related Receptor Effects** - Interactions between impacts on a receptor or group of receptors within a Proposed Development stage (Inter-related Receptor Effects).

15.10.2 Proposed Development Lifecycle and Receptor led inter-related effects from military and civil aviation are presented in Table 15.22.

Table 15.22 Inter-related Effects of Military and Civil Aviation

Impact	Significant Inter-related Effect
Project Lifecycle Effects	
Creation of an aviation obstacle environment	The potential impact on Military and Civil Aviation will gradually increase during the construction phase as infrastructure is installed within the Aspen Array Area. The obstacle environment will then remain constant until the decommissioning phase. The effects during the different phases are not anticipated to interact in such a way as to generate an effect of greater significance than those assessed for individual phases. Once appropriate mitigations are in place for the creation of an aviation obstacle environment, they will remain in place until the end of the decommissioning phase.
Increased air traffic in the area related to wind farm activities	The impact of increased air traffic will be continuous across construction, operation and maintenance, and decommissioning phases. The predicted helicopter movements during each phase will be managed by the existing ATS infrastructure and pilots will be expected to operate in accordance with regulatory requirements. Across the Proposed Development's lifetime, the effects on Military and Civil Aviation receptors from increased air traffic are not anticipated to interact in such a way as to generate an effect of greater significance than those assessed for individual phases.
Inter-related Receptor Effects	
The interaction of the impacts of the aviation obstacle environment and increased air traffic related to wind farm activities on existing military and civil air traffic.	The greatest potential for spatial and temporal interactions is likely to occur due to the interaction of aviation obstacles and increased air traffic. The impacts have both been assigned an effect significance of minor when assessed in isolation. Embedded commitment measures, the existing ATS infrastructure, and pilot compliance with regulatory requirements will reduce the potential for interaction of these impacts. Therefore, it is anticipated that the combined effect on existing airspace users will

Impact	Significant Inter-related Effect
	not be of greater significance than when the effects are assessed in isolation.

15.11 Assessment Summary

15.11.1 A summary of the findings of the effects and CEA undertaken in section 15.7 and section 15.8 is provided in Table 15.23 and Table 15.24, respectively. This includes residual effect significance after any required secondary mitigation and proposed monitoring.

Table 15.23 Summary of Assessment of Effects on Military and Civil Aviation

Impact	Receptor	Magnitude of Impact	Sensitivity of Receptor	Effect Significance	Secondary Mitigation	Residual Effect	Proposed Monitoring
Construction							
Impact 1: Creation of an Aviation Obstacle Environment	Military low flying/offshore helicopters/SAR operations	Low	Medium	Minor	n/a	n/a	n/a
Impact 2: Increased Air Traffic in the Area Related To Wind Farm Activities	Helicopters support operations/existing air traffic	Low	Medium	Minor	n/a	n/a	n/a
O&M							
Impact 3: Creation of an Aviation Obstacle Environment	Military low flying/offshore helicopters/SAR operations	Low	Medium	Minor	n/a	n/a	n/a
Impact 4: Increased Air Traffic in the Area Related to Wind Farm Activities	Helicopters support operations/existing air traffic	Low	Medium	Minor	n/a	n/a	n/a
Impact 5: Impact on NATS Allanshill and RRH Buchan	NATS Allanshill/RRH Buchan/Hill of Dudwick weather radar	High	High	Major	Technical mitigations to be agreed with NATS and the MOD	Minor	n/a
Decommissioning							
Impact 6: Increased Air Traffic in the Area Related to Wind Farm Activities	Helicopter support operations/existing air traffic	Low	Medium	Minor	n/a	n/a	n/a

Table 15.24 Summary of Assessment of Cumulative Effects on Military and Civil Aviation

Impact	Receptor	Magnitude of Impact	Sensitivity of Receptor	Effect Significance	Secondary Mitigation	Residual Effect	Proposed Monitoring
Construction							
Impact 7: Creation of an Aviation Obstacle Environment	Military low flying/offshore helicopters/SAR operations	Low	Medium	Minor	n/a	n/a	n/a
O&M							
Impact 8: Creation of an Aviation Obstacle Environment	Military low flying/offshore helicopters/SAR operations	Low	Medium	Minor	n/a	n/a	n/a
Impact 9: Impact on NATS Allanshill and RRH Buchan	NATS Allanshill/RRH Buchan/Hill of Dudwick weather radar	High	High	Major	Technical mitigations to be agreed with NATS and the MOD	Minor	n/a

15.12 References

CAA (2016), 'CAP 764: Policy and Guidelines on Wind Turbines', https://www.caa.co.uk/our-work/publications/documents/content/cap-764/ [Accessed: May 2025].

CAA (2019), 'CAP 670: Air Traffic Services Safety Requirements', https://www.caa.co.uk/our-work/publications/documents/content/cap-670/ [Accessed: May 2025].

CAA (2022), 'ANO 2016', https://www.legislation.gov.uk/uksi/2016/765/contents [Accessed: May 2025].

CAA (2022), 'CAP 168: Licensing of Aerodromes', https://www.caa.co.uk/our-work/publications/documents/content/cap-168/ [Accessed: May 2025].

CAA (2023), 'CAP 437: Standards for offshore helicopter landing areas' https://www.caa.co.uk/our-work/publications/documents/content/cap-437/ [Accessed: May 2025].

CAA (2024), 'CAP 1616: The Process for Changing the Notified Airspace Design' https://www.caa.co.uk/our-work/publications/documents/content/cap1616/ [Accessed: May 2025].

CAA (2024), 'UK Standardised Rules of the Air' https://regulatorylibrary.caa.co.uk/923-2012/Content/SERA%20923-2012_1.htm [Accessed: May 2025].

CAA (2025), 'CAP 032: UK AIP' https://nats-uk.ead-it.com/cms-nats/opencms/en/Publications/AIP/ [Accessed: May 2025].

EUMETNET (2025), 'OPERA Database' https://www.eumetnet.eu/wp-content/themes/aeron-child/observations-programme/current-activities/opera/database/OPERA_Database/index.html [Accessed: May 2025].

HCA (2025), 'Certificates' https://www.helidecks.org/information/certificates/ [Accessed: May 2025].

MCA (2021), 'MCA MGN 654 Safety of Navigation: OREIs – Guidance on UK Navigational Practice, Safety and Emergency Response' https://assets.publishing.service.gov.uk/media/64637cd60b72d3000c34454c/MGN_654.pdf [Accessed: May 2025].

MCA (2024), 'MCA document Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for SAR and Emergency Response (MGN 654 Annex 5)' https://assets.publishing.service.gov.uk/media/65a695fc640602000d3cb75d/OREI_SAR_Requirements_v4_.pdf [Accessed: May 2025].

Met Office (2025), 'Protecting our observing capability' https://www.metoffice.gov.uk/services/business-industry/energy/safeguarding#:~:text=Information%20and%20guidance%20for%20developers,the%20formal%20planning%20consultation%20process [Accessed: May 2025].

MOD (2020), 'MOD Obstruction Lighting Guidance' https://www.contarnex.com/infrared-obstruction-lighting/MOD%20Obstruction%20Lighting%20Guidance%202020.pdf [Accessed: May 2025].

NATS (2012), 'Wind farm self-assessment maps' https://www.nats.aero/services-products/services/wind-farms/n/wind-farms-self-assessment-maps/ [Accessed: May 2025].
NSTA (2025), 'Offshore Infrastructure Data' https://opendata-nstauthority.hub.arcgis.com/search [Accessed: May 2025].

Ofcom (2024), 'Protected Radar List' https://www.ofcom.org.uk/siteassets/resources/documents/manage-your-licence/mobile-wireless-and-broadband/cellular/protected-radar-list.pdf?v=374238 [Accessed: May 2025].

Scottish Government (2015), 'Scotland's National Marine Plan' https://www.gov.scot/publications/scotlands-national-marine-plan/ [Accessed: May 2025].

Scottish Government (2022), 'Guidance for applicants on using the design envelope for applications under section 35 of the Electricity Act 1989' https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2020/02/marine-licensing-applications-and-guidance/documents/guidance/guidance-for-applicants-on-using-the-design-envelope-for-applications-under-section-36-of-the-electricity-act-1989/guidance-for-applicants-on-using-the-design-envelope-for-applications-under-section-36-of-the-electricity-act-1989/govscot%3Adocument/guidance-applicants-using-design-envelope-applications-under-section-36-electricity-act-1989.pdf [Accessed: May 2025]

Scottish Government (2024), 'National Planning Framework 4' https://www.gov.scot/publications/national-planning-framework-4/ [Accessed: May 2025].

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