

CAA Environmental Assessment

Title of airspace change proposal	Future Combat Airspace for Military Collective Training
Change sponsor	Ministry of Defence (MoD)
Project reference	ACP-2020-026
Account Manager	
Case study commencement date	25/08/2023
Case study report as at	27/11/2023

Instructions

In providing a response for each question, please ensure that the 'status' column is completed using the following options:

YES
 NO
 PARTIALLY
 N/A

To aid the SARG Lead it may be useful that each question is also highlighted accordingly to illustrate what is:

resolved YES not resolved PARTIALLY not compliant ... NO...

1. Introduction

This CAA environmental assessment and statement describes the environmental factors relevant to the Ministry of Defence's (MoD), i.e., the 'sponsor', Airspace Change Proposal (ACP) to secure an appropriate volume of permanent segregated airspace i.e., Future Combat Airspace (FCA) to safely facilitate occasional large scale, highly complex, multi-domain tactical collective training exercises for the UK Armed Forces.

Existing Military Training Areas (MTA) and Managed Danger Areas (MDA) such as Danger Areas (DA) D323, D513 and D613 are unsuitable to meet the sponsor's requirements due to a number of reasons: insufficient volumes to contain and segregate Large Force Exercises, limitations in high speed and energy manoeuvring for military aircraft, increased risk of military and civil interactions and less predictable traffic flows, longer flying distances to the main Royal Air Force (RAF) bases and having to cross busy Air Traffic Service (ATS) routes, no availability of a suitable number of diversion airfields, no availability of overland areas, and less proximity to the Electronic Warfare Testing and Training Range (EWTTR), amongst others. The introduction of Free Route Airspace (FRA), complexities associated with Flight Buffer Zones (FBZ) and the Airspace Modernisation Strategy (AMS) also require the inclusion of DAs in the UK Aeronautical Information Publication (AIP).

The sponsor has therefore proposed the establishment of FCA extending from Flight Level (FL) 85 to FL660 (i.e., 8,500 ft. to 66,000 ft.) located on the Eastern coast of the UK (Northeast England/Southeast Scotland), predominantly over the sea, with a small overland portion on the shortest edge. FCA has been informed by data collected through ACP-2020-042: Future Combat Airspace Trial, ACP-2021-007: Interim Solution for Future Combat Airspace pending Completion of ACP-2020-026 and ACP-2021-048: Future Combat Airspace Interim Solution – 2022, and is stated to meet all of the sponsor's objectives as listed in the Statement of Need (SoN). FCA has been developed to minimise impact on other airspace users through its airspace design: higher base level and lateral position mainly over the North Sea, avoidance of standard arrival and instrument departure routes at local airports, and through safe use and efficient management of airspace, increased predictability through standardisation of DA activation times, and provision of sufficient notification periods.

2. Natı	ure of the Proposed Change	Status
2.1	Is it clear how the proposed change will operate, and therefore what the likely environmental impacts will be?	YES
	FCA will be activated by the Military Airspace Management Cell (MAMC) via Notices to Aviation (NOTAM) at lea advance and only when required, with each activation lasting up to four hours between 0900 - 1300 UTC. Activational place during weekends and bank holidays. Based on frequency of exercises conducted in 2023 (32 activations), it there will be a gradual increase up to 55 activations per year, depending on MoD requirements:	ation will not take
	• Exercise A: ~12-15 missions per exercise lasting up to 4 hours each; held twice a year (25 annual activati	ons).
	 Exercise B: ~6 missions lasting 4 hours each; held twice a year (12 annual activations). 	
	 Exercise C: 3 missions per exercise lasting 4 hours each; held 6 times per year, twice a month in February November (18 annual activations) 	y, June and
	When the proposed airspace is active, a Danger Area Activity Information Service (DAAIS) will be provided by Sc Information. The airspace will be handed back for civil use under Flexible Use of Airspace (FUA) and Airspace Ma policy principles when not required.	
	The ACP is scaled as a Level M1 as it has the potential to alter civil aviation traffic patterns below 7,000 ft. over an inh being sponsored by the MoD. For Level M1 ACPs, the CAA is directed to disregard the environmental impacts that are military aircraft or military operations (including civil aircraft carrying out military function under contract). However, environmental impacts from other airspace users (i.e., civil aviation) that are a result of the proposed change must be accordance with Level 1 requirements.	e a direct result of consequential
	The sponsor has provided a detailed description of the airspace and civil aviation movements and patterns in the vicin	nity in order to provide

an understanding of current-day aircraft activities.

The proposed DA will be situated in a combination of Class G (below FL195) and Class C (above FL195) airspace within both the London and Scottish Flight Information and Upper Information Regions. A significant volume of the airspace above FL255 is FRA while the Northumbria Areas (North and South) Temporary Reserved Areas (Gliding) extend in Class C airspace between FL195 - FL240. A number of reporting points, FRA waypoints and North Atlantic Tracks are situated within the FCA volume along with a number of airports (Aberdeen, Dundee, Edinburgh, Newcastle and Teesside Airports) also present in the local area.

The sponsor states that the activation of extant well-established DAs in the vicinity such as D323, D613 and D513 are known to have no impact on traffic patterns below 7,000 ft. as their over land portions extend above FL150 and Class G airspace that is situated below offers airspace users flexibility to navigate freely even when active. Similarly, FCA will avoid all Control Zones (CTR), Control Areas (CTA), Terminal Manoeuvring Areas (TMA) and maintain published departure and arrival procedures (Standard Instrument Departures (SID) and Standard Terminal Arrival Routes (STAR)) at the identified airports and therefore, impacts on traffic patterns below 7,000 ft. are not anticipated.

However, with respect to Newcastle Airport, the sponsor acknowledges that flying the published procedures may not be the most expeditious routing and some Air Traffic Controllers or aircraft opt to fly more direct routes which may no longer be possible when FCA is activated. Additionally, the sponsor states that some flights operating direct routes between Newcastle/Teesside and Aberdeen/Edinburgh airports may also be required to reroute around the activated DA, resulting in longer routes.

To further understand the scale of this impact, the sponsor used Eurocontrol NEST (v1.8) to analyse flight plans filed between 19 May 2022 to 15 June 2022 of aircraft arriving at and departing from Newcastle Airport, and flying through or below the proposed DA. This data was analysed for the maximum number of impacted flights during a four-hour rolling window (corresponding with the duration of FCA activation times). The assessment indicated that a maximum of 5 flights were potentially impacted during any single activation of FCA. This figure is expected to only marginally increase to approximately 6 flights by 2033, assuming growth rates from Eurocontrol's STATFOR October 2021 traffic forecast, supported by NATS forecast when STATFOR was unavailable. Further, Automatic Dependent Surveillance - Broadcast (ADS-B) data collected for the activation period of D597 (DA associated with ACP-2021-048) in September 2022 indicated that a total of 3 aircraft operating at Newcastle Airport had to be rerouted.

With respect to the specific impact on Dundee Airport, ADS-B and Multilateration (MLAT) data collected for 10 activation periods of D597 between August and September 2022 indicated that a total of 23 Instrument Flight Rules (IFR) aircraft were impacted. Given the minimal number of impacted flights (including any traffic recovery post Covid19 and business as usual growth indicated through available forecasts), and the number of annual FCA activations proposed, it is unlikely that this ACP will result in a material change in traffic patterns at the local airports.

In terms of General Aviation (GA) and Visual Flight Rules (VFR) activity, the sponsor states that the airspace between Edinburgh and the Angus East Coast is a VFR Significant Area of Interest, as identified in a report published by Airspace4All in October 2018, and is popular for

flight training, aircraft rental, gliding, hang-gliding, parachuting, and aerial surveying, besides being used regularly by the police and helimed flights. The airspace is also used by traffic avoiding the high ground of the Southern Uplands and associated cloud bases, and transiting on the East Coast to/from central Scotland and North-East England instead. The sponsor presented a heatmap of VFR activity sourced from Airspace4All to demonstrate the high levels of activity in the area. ADS-B, MLAT and Mode-S data collected between 0900 – 1300 UTC for a two-week period in August 2022 (8 – 12 August 2022 and 15 – 19 August 2022 (discounting weekends and 18 August) was also presented to indicate the number of GA movements between SFC – FL195:

- Total number of GA movements: 329
- Average daily number of GA movements: 37
- Average daily number of GA movements in Area 1 (over land North): 25
- Average daily number of GA movements in Area 2 (over land South): 7
- Average daily number of GA movements in Area 3 (over sea): 4
- Average altitude: 4,000 ft.

Note that all commercial aircraft above FL195, any traffic routing to and from Newcastle Airport, and gliding activities were not considered in the assessment above. The data represented days when the D597 was inactive so as to evaluate the unrestricted number of GA movements and traffic densities in the local airspace.

In terms of gliding activities up to FL245, the sponsor states that qualitative feedback from the Borders Gliding Club Airspace and its Liaison Officer indicated that operations occur only on Fridays, Saturdays and Sundays with 15 – 20 average flights per day, and a maximum record of 37 flights on one particular day. An example of the Daily Log Sheet from the Borders Gliding Club and a heat map of their activities was also provided. With respect to the activities of the British Hang Gliding and Parachuting Association (BHPA), the BHPA Electronic Conspicuity August 2022 position paper identifies only a few flight routes within the lateral limits of FCA. Additionally, the sponsor's consultation with BHPA revealed that most flights occur between 6,500 – 7,500 ft.

Based on the rationale and supporting evidence provided as described above, the sponsor concludes that there is no impact on traffic patterns of aircraft users (GA, VFR activity and gliders) below 7,000 ft. caused as a result of this ACP. This is due to the average operating altitudes of these users and the higher base level and lateral over sea positioning of the proposed DA. FCA is therefore unlikely to result in any restriction to these aircraft movements when activated. The airspace below FL195 is classified as Category G, uncontrolled airspace, with no restrictions on which aircraft can enter it, what equipment aircraft must carry, or which routes aircraft can take. This means that the activities of these airspace users consequentially affected by the ACP are not possible to predict with any certainty. Any potential impacts are also expected to be limited by mitigation measures proposed by the sponsor such as advance notification of DA activity. Given the rationale and supporting evidence provided by the sponsor, it is unlikely that this ACP will result in a material change in traffic patterns in the local area.

Therefore, despite being scaled as a Level M1 change, the CAA agrees with the sponsor's assessment and concludes that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, ground based environmental impacts below 7,000 ft. (noise, local air quality, tranquillity and biodiversity) have been scoped out of the environmental assessment. As this ACP is unlikely to impact GA activities, consequential impacts on CO₂ emissions resulting from any such change in GA traffic patterns have also been excluded from the environmental assessment.

In terms of impacts on IFR flight paths and resulting CO₂ emissions, the sponsor states that the activation of FCA will impact some routes such as those between Aberdeen/Newcastle/Edinburgh and Amsterdam, especially those via RIVOT and CUTEL in the FRA region and others via P18 (daytime activations of FCA are however, unlikely to have an impact on P18). The sponsor continues to state that certain reporting points/waypoints used by North Atlantic Tracks and traffic routing via the Amsterdam and Copenhagen Flight Information Regions (FIR) which are within the proposed DA will also become unavailable during its activation. The unavailability of these routes will thereby require General Air Traffic (GAT) to reroute around the DA using longer alternative tracks which will result in increased fuel burn and CO₂ emissions. Therefore, the impacts caused due to the activation of FCA are assessed to be negative when compared to a scenario where FCA is inactive and unrestricted routings are available.

The sponsor's baseline, however, assumes that if FCA is not implemented, the extant DAs (D323 and D613) in combination with Class G/C airspace will continue to be used for the sponsor's requirements. In scenarios where these DAs are activated, some direct route structures for aircraft using the North Atlantic Tracks, including those transiting between the UK and mainland Europe become unavailable. The baseline impacts therefore include the 'funnelling' of aircraft between these two DAs, which in turn causes longer track miles and increases fuel burn and CO₂ emissions. In contrast to this baseline, when FCA is activated, protocols prohibiting the concurrent activation of such DAs in the vicinity will limit impacts on GAT. Alternative flight plannable routes (Conditional Routes (CDR), FRA region and notified Directs (DCT), etc.) will be introduced, thus avoiding FCA. Additionally, Scottish Control will manage the flow of GAT around FCA by use of other existing route structures and FRA. The sponsor concludes that rerouting around FCA while other extant DAs are inactive will in fact facilitate more direct routes between the UK and Europe as compared to the funnelling and rerouting around D323 and D613 that occurs when these two DAs are active. Although a small number of flights may still continue to be negatively impacted on specific reroutes (e.g., between Newcastle/Teesside and Aberdeen/Edinburgh airports), the overall impacts in terms of fuel burn and CO₂ emissions when considering all GAT impacted by FCA are assessed to be positive within the London/Scottish FIR boundaries.

Feedback from previous related ACPs where airspace structures similar to FCA were temporarily activated suggests that a saving in fuel burn and CO_2 emissions is achieved as a result of shorter track miles flown when D323 is suppressed. The sponsor's assessment predicts a decrease in average fuel burn per flight of 78 kg, leading to a decrease in average CO_2 e emissions per flight of 249 kg within the London/Scottish FIR boundaries. In terms of total emissions, the sponsor's assessment predicts a decrease by 1,700 t CO_2 e in 2023 and by 1,901 t CO_2 e by 2033, an annual decrease of 2% from baseline values. For the appraisal period between 2023 – 2033, this amounts to an estimated total saving of 19,911 t CO_2 e.

The sponsor also lists several mitigation measures that will be implemented to minimise the scale of impacts on other airspace users.

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FCA will be activated only when necessary and therefore impacts are only anticipated during specific activation times of the DA. Letters of Agreement (LoA) will be signed with impacted stakeholders and will include procedures to minimise potential disruption, details on alternative routing instructions and options, advance planning of entry and egress routes, transfers, agreements on the provision of sufficient notice periods to stakeholders, DA activation and cancellation processes, guarantee of service provision and publication of detailed entry and exit points and associated transit routes of military aircraft. Agreement of FCA activation times that are deconflicted with peak operating hours at the airports will also be clearly stated and shared with all stakeholders. Additionally, a bespoke service and specific air traffic service procedures will be applied to aircraft both inbound to and outbound from Newcastle and Teesside airports and routing via reporting point CUTEL as aircraft transit to and from the Copenhagen FIR. Airspace sharing procedures will be managed by the UK Airspace Management Cell (AMC).

etary of State Call-in Noise Criterion	Status
Is the proposal likely to meet the Secretary of State's criterion for call-in on noise impacts? If yes, has the additional assessment on that criterion been undertaken and what are the results? If no, what is the rationale for that conclusion?	
The criterion, as set out in the DfT's Air Navigation Guidance $(2017)^1$ is that the proposed airspace change could lead to a change in noise distribution resulting in a 10,000 net increase in the number of people subjected to a noise level of at least 54 dB ² as well as having an identified adverse impact on health and quality of life. ³	N/A
CAP1616 paragraph B54 identifies that an assessment of health and quality of life impacts using Department for Transport Transport Analysis Guidance (TAG) will not be required for any airfield or aerodrome with fewer than an average of 30 mo per day. This screening criteria assumes that 30 aircraft movements per day will be required to trigger noise levels of 51 did which is the point at which adverse effects begin to be seen on a community basis and therefore the lowest input value for purposes of TAG. A 3 dB increase in noise is equivalent to a doubling of noise energy and therefore approximately 60 aircraft movements per day would be expected to result in noise levels above 54 dB L _{Aeq,16hr} . Based on the rationale and supporting provided by the sponsor as explained in Q2.1, the CAA therefore concludes that this ACP is unlikely to lead to a change in result in the case of the ca	
	Is the proposal likely to meet the Secretary of State's criterion for call-in on noise impacts? If yes, has the additional assessment on that criterion been undertaken and what are the results? If no, what is the rationale for that conclusion? The criterion, as set out in the DfT's Air Navigation Guidance (2017) ¹ is that the proposed airspace change could lead to a change in noise distribution resulting in a 10,000 net increase in the number of people subjected to a noise level of at least 54 dB ² as well as having an identified adverse impact on health and quality of life. ³ CAP1616 paragraph B54 identifies that an assessment of health and quality of life impacts using Department for Transport Analysis Guidance (TAG) will not be required for any airfield or aerodrome with fewer than an average per day. This screening criteria assumes that 30 aircraft movements per day will be required to trigger noise level which is the point at which adverse effects begin to be seen on a community basis and therefore the lowest inpurposes of TAG. A 3 dB increase in noise is equivalent to a doubling of noise energy and therefore approximate movements per day would be expected to result in noise levels above 54 dB L _{Aeq,16hr} . Based on the rationale and

¹ The DfT's call-in criteria are set out in The Civil Aviation Authority (Air Navigation) Directions 2017, Section 6, paragraph (5). These Directions are replicated in Annex D of the DfT's Air Navigation Guidance 2017,

² LAeq 16h noise exposure.

³ The assessment of the numbers of people affected and the associated adverse impacts on health and quality of life of the airspace change proposal should be carried out by the sponsor in accordance with the requirements set out in the DfT's Guidance.

identified adverse impact on health and quality of life.

4. Statement of Need		Status
4.1	Does the Statement of Need include any environmental factors?	NO
	The statement of need does not include any environmental factors.	

5. Des	sign Principles	Status
5.1	Does the final set of Design Principles include any environmental objectives?	YES
	The sponsor developed a set of 11 Design Principles (DP), two of which are considered to include an environmental objective lead to a positive environmental outcome. Both these DPs have been assigned as Priority 3:	
	 DP(f): Minimise environmental impacts including noise (where relevant) 	
	 DP(g): Minimise environmental impacts including CO₂ emissions 	
Additionally, 'DP(e): Minimise impact on other airspace users and the network' (Priority 2) is considered to influence the scale of consequential environmental impacts on GAT and is therefore considered to include an environmental objective. No 'DP(d): Optimise Airspace Management (ASM) applying Flexible Use of Airspace (FUA) principles and ASM Policy' (Priority 4 minimise disruptions to GAT and therefore limits consequential environmental impacts by efficient operational management that not all the design principles include a SMART objective or are fully defined.		ive. Moreover, rity 4) also aims to
5.2	Does the proposal explain how and to what extent the final airspace design achieves any environmental Design Principles?	YES
	In terms of 'DP(f): Minimise environmental impacts including noise (where relevant)', the sponsor states that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP and therefore ground based environmental impacts, including noise have been scoped out of the environmental assessment. It is therefore considered that this DP has been met.	
	In terms of ' $DP(g)$: Minimise environmental impacts including CO_2 emissions', the sponsor states that the final airspace the overall impacts in terms of fuel burn and CO_2 emissions within the London/Scottish FIR boundaries, and therefore this DP has been met. Note that it is unclear whether the airspace design also facilitates a decrease in fuel burn and C entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entire flight trajectories (including the Coceanic Entire flight) in	it is considered that O ₂ emissions over

	London/Scottish FIR are different from those in the original flight plan.		
	In terms of 'DP(e): Minimise impact on other airspace users and the network' and 'DP(d): Optimise Airspace Management (ASM) applying Flexible Use of Airspace (FUA) principles and ASM Policy', the sponsor states that the final airspace design avoids impact on any CTR, CTA, TMA, SIDs, STARs, or on GA, VFR activity or gliders by setting an appropriate base level and positioning over the North Sea. Although a small number of flights may be negatively impacted on specific reroutes (e.g., between Newcastle/Teesside and Aberdeen/Edinburgh airports), when considering all GAT impacted by FCA, rerouting around FCA while other extant DAs are inactive will in fact facilitate more direct routes between the UK and Europe as compared to the funnelling and rerouting around D323 and D613 that occurs when these two DAs are active. A number of mitigation measures such as advance notifications, LoAs, FUA and ASM procedures have also been proposed to limit the consequential impact of the final airspace design on other airspace users. It is therefore considered that these DPs have been met.		
5.3	Were there any proposed environmental Design Principles that were rejected from the final set? If so, is the rationale for rejecting those Principles reasonable?	NO	
	No environmental Design Principles were rejected from the final set. The original 'DP(f): Minimise noise and environmental impacts, where relevant' was separated into two distinct DPs as DP(f) and DP(g).		
5.4	Were there any design options during the airspace change process that might have better met the environmental Design Principles than the final proposal as submitted to the CAA? If so, is the rationale for rejecting those options set out?	NO	
	The sponsor only developed the following two design options:		
	Option 0 – Do Nothing		
	Option 1 – Create new Special Use Airspace with overland portion		
	Option 0 considered the continued use of D323, D613 and Class G and C airspace but was discounted at Step 2A: Design Principle Evaluation on the basis that it does not meet the sponsor's requirements in terms of sufficient airspace volumes for training, availability of overland areas and appropriate segregation of military aircraft conducting high energy manoeuvres from GAT.		
	Option 1 was therefore retained and progressed through the options appraisals as the sponsor's final design optilargely replicated the previous airspace structures that the sponsor used to conduct the training exercises and the requirements listed in the SoN.	_	

6. Opti	ons Appraisal	Status
6.1	Have environmental impacts been adequately reflected and assessed in the Options Appraisal?	YES
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being scaled as a Level M1 change, ground based environmental impacts below 7,000 ft. (noise, local air quality, tranquillity and biodiversity) have been scoped out of the environmental assessment.	
	In terms of CO ₂ emissions, the sponsor has presented a quantitative assessment of fuel burn and CO ₂ emissions using DfT's TAG including annual totals and on a per flight basis which indicate a positive impact on CO ₂ emissions (i.e., savings) within the London/Scottish FIR boundaries. As this ACP is unlikely to impact GA activities, consequential impacts on CO ₂ emissions resulting from any change in GA traffic patterns have been excluded from the CO ₂ assessment.	
6.2	Is the final proposal as submitted to the CAA the airspace design option that also produced the best environmental impacts as assessed by the Options Appraisal? If not, does the rationale for selecting the preferred option adequately explain this choice?	YES
	As stated in Question 5.4 above, only Option 1 was developed and progressed through the options appraisals as preferred design option and submitted to the CAA in the final proposal.	the sponsor's

7. Noise	[for Level 1 and Level M1 airspace change proposals]	Status
7.1	Has the noise impact been adequately assessed and presented in both the consultation material and the final submission to the CAA, taking account of scalability and proportionality?	N/A
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being scaled as a Level M1 change, noise impacts have been scoped out of the environmental assessment.	
7.2	If a noise assessment has not been undertaken by the sponsor, has this decision been adequately explained and evidenced in both the consultation material and the final submission to the CAA, and is the rationale reasonable?	N/A
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no mate traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being M1 change, noise impacts have been scoped out of the environmental assessment.	

7.3	Summary of anticipated noise impacts from the final proposed airspace change.
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being scaled as a Level M1 change, noise impacts have been scoped out of the environmental assessment.

8. CO	2 Emissions	Status
8.1	Has the impact on CO_2 emissions been adequately assessed and presented in both the consultation material and the final submission to the CAA, taking account of scalability and proportionality?	PARTIALLY
	The sponsor has presented a quantitative assessment of fuel burn and CO ₂ emissions using DfT's TAG, including ann a per flight basis.	
	The environmental assessment was performed by NATS Analytics (report A22131). The baseline involves simultal D323 and D613 which are replaced by an activation of FCA in the design option scenario. This comparison estab small number of flights may still continue to be negatively impacted on specific reroutes (e.g., between Newcastle/T Aberdeen/Edinburgh airports), the overall impacts in terms of fuel burn and CO ₂ emissions when considering all GA assessed to be positive when compared to the modelled baseline values within the London/Scottish FIR boundaries	lishes that although a eesside and I impacted by FCA are
	The assessment assumes a total of 55 annual activations of FCA between 0900 to 1300 UTC with no simultaneous other DAs. A Traffic Filter Region (TFR) was first defined to identify traffic whose trajectory is likely to be impacted of the DAs. Further, a Simulated Region extending over a larger airspace volume was developed to account for the trajectory when changes in the Oceanic Entry/Exit Points to the London/Scottish FIR occurred due to activation/DAs. Entry and exit points in the Simulated Region were matched to original flights plans in order to assume real the North Atlantic Tracks, including any rerouting around the DAs.	ed by the activation he entire flight deactivation of the
	The sponsor's assessment methodology consisted of analysing historic data for potential FCA activation months, pair flows, and traffic counts to identify days representative of an appropriate traffic sample in line with post Co Four days in May-June 2022 were then selected and simulated in NEST (v1.8) in order to create a representative potentially impacted by an activation of FCA and a deactivation of DA323 and DA613, resulting in 124 flights.	vid19 recovery.
	The traffic sample identified was then assessed for the baseline scenario (i.e., rerouting around activated D323 a design option scenario (i.e., rerouting around activated FCA) in terms of average track miles within London/Scot and fuel burn. CO ₂ emissions per flight were calculated using BADA 4.2 and an emission factor of 3.18 kg CO ₂ e por These results were then scaled up by the average number of impacted flights per activation (124 flights), and by	tish FIR boundaries er kg of fuel burn.

activations of FCA to give annualised results. Projection to 2033 (10 years post implementation) was performed using Eurocontrol's STATFOR October 2021 traffic forecast until 2027 and NATS' extension thereafter.

The sponsor's assessment predicts a decrease in average fuel burn per flight of 78 kg, leading to a decrease in average CO_2e emissions per flight of 249 kg within the London/Scottish FIR boundaries. In terms of total emissions, the sponsor's assessment predicts a decrease by 1,700 t CO_2e in 2023 and by 1,901 t CO_2e by 2033, an annual decrease of 2% from baseline values. For the appraisal period between 2023 – 2033, this amounts to an estimated total saving of 19,911 t CO_2e .

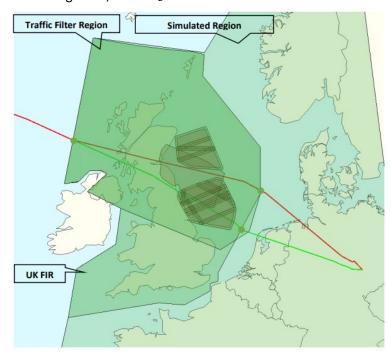


Figure 1: London/Scottish FIR, Simulated Region with locations of the DAs, overlaid with an example of a baseline flight trajectory (red) and design option flight trajectory (green), green dots marking entry/exit points to London/Scottish FIR

Note that it is unclear whether the airspace design also facilitates a decrease in fuel burn and CO_2 emissions over entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entry/Exit Points to the London/Scottish FIR are different from those in the original flight plan.

It is also acknowledged that certain reporting points/waypoints used by North Atlantic Tracks and traffic routing via the Amsterdam and

	Copenhagen FIRs which are within the proposed DA will also become unavailable during its activation. The unavailability of these routes will thereby require GAT to reroute around the DA using longer alternative tracks which will result in increased fuel burn and CO ₂ emissions. Therefore, the impacts caused due to the activation of FCA are assessed to be negative when compared to a scenario where FCA is inactive and unrestricted routings are available.	
As this ACP is unlikely to impact GA activities, consequential impacts on CO ₂ emissions resulting from any char patterns have been excluded from the environmental assessment.		
	The sponsor has presented a TAG assessment using DfT's Greenhouse Gases Workbook (version May 2023). However, the tCO ₂ e values from 2023 to 2033 that are used as input data in the workbook are based on 32 activations of FCA, instead of 55. CO ₂ emissions have been split by traded sector (45%) and non-traded sector (55%) but no explanation has been provided for this assumption.	
	An updated version of Eurocontrol's STATFOR traffic forecast from October 2023 for the 2023 to 2029 period is also available. However, the traffic growth rate in the latest version is similar to the one considered in the sponsor's assessment and therefor reassessment using the October 2023 forecast is unlikely to show any significant differences.	
	A few recommendations and conditions have therefore been proposed in order to address these observations (see Question 17.1).	
8.2	If an assessment of the impact on CO_2 emissions has not been undertaken by the sponsor, has this decision been adequately explained and evidenced in both the consultation material and the final submission to the CAA, and is the rationale reasonable?	
	The sponsor has presented a quantitative assessment of fuel burn and CO ₂ emissions using DfT's TAG, including annual totals and caper flight basis which indicate a positive impact on CO ₂ emissions (i.e., savings) within the London/Scottish FIR boundaries. As this ACP is unlikely to impact GA activities, consequential impacts on CO ₂ emissions resulting from any such change in GA traffic pattern have been excluded from the CO ₂ assessment.	is
8.3	Summary of anticipated impact on CO ₂ emissions from the final proposed airspace change.	
	It is acknowledged that certain reporting points/waypoints used by North Atlantic Tracks and traffic routing via the Amsterdam and Copenhagen FIRs which are within the proposed DA will also become unavailable during its activation. The unavailability of these route will thereby require GAT to reroute around the DA using longer alternative tracks which will result in increased fuel burn and CO ₂ emissions. Therefore, the impacts caused due to the activation of FCA are assessed to be negative when compared to a scenario where FCA is inactive and unrestricted routings are available.	
However, the baseline for the CO ₂ assessment involves simultaneous activations of D323 and D613 which are replace activation of FCA in the design option scenario. This comparison establishes that although a small number of flights m to be negatively impacted on specific reroutes (e.g., between Newcastle/Teesside and Aberdeen/Edinburgh airports),		e

impacts in terms of fuel burn and CO₂ emissions when considering all GAT impacted by FCA are assessed to be positive when compared to the modelled baseline values within the London/Scottish FIR boundaries.

The sponsor's assessment predicts a decrease in average fuel burn per flight of 78 kg, leading to a decrease in average CO_2 e emissions per flight of 249 kg within the London/Scottish FIR boundaries. In terms of total emissions, the sponsor's assessment predicts a decrease by 1,700 t CO_2 e in 2023 and by 1,901 t CO_2 e by 2033, an annual decrease of 2% from baseline values. For the appraisal period between 2023 – 2033, this amounts to an estimated total saving of 19,911 t CO_2 e.

Note that it is unclear whether the airspace design also facilitates a decrease in fuel burn and CO_2 emissions over entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entry/Exit Points to the London/Scottish FIR are different from those in the original flight plan.

The sponsor has presented a TAG assessment using DfT's Greenhouse Gases Workbook (version May 2023). However, the tCO₂e values from 2023 to 2033 that are used as input data in the workbook are based on 32 activations of FCA, instead of 55.

The sponsor states that impacts will be mitigated through LoAs with stakeholders and suppressing activations of surrounding DAs. FCA will also be managed through the MAMC and the airspace will be handed back for civil use under FUA and ASM policy principles should the DA not be required.

9. Loca	Air Quality [for Level 1 and Level M1 airspace change proposals]	Status	
9.1	Has the impact on Local Air Quality been adequately assessed and presented in both the consultation material and the final submission to the CAA, taking account of scalability and proportionality?	N/A	
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no m traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite bein M1 change, impacts on local air quality have been scoped out of the environmental assessment.	_	
9.2	If an assessment of the impact on Local Air Quality has not been undertaken by the sponsor, has this decision been adequately explained and evidenced in both the consultation material and the final submission to the CAA, and is the rationale reasonable?	N/A	
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no m traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite bein M1 change, impacts on local air quality have been scoped out of the environmental assessment.	_	
9.3	Summary of anticipated impact on Local Air Quality from the final proposed airspace change.		

As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being scaled as a Level M1 change, impacts on local air quality have been scoped out of the environmental assessment.

10. Tranc	quillity [for Level 1 and Level M1 airspace change proposals]	Status
10.1	With specific reference to Areas of Outstanding Natural Beauty and National Parks - Has the impact on tranquillity been adequately considered and presented in both the consultation material and the final submission to the CAA, taking account of scalability and proportionality?	N/A
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being M1 change, impacts on tranquillity have been scoped out of the environmental assessment.	-
10.2	If consideration of the impact on tranquillity has not been undertaken by the sponsor, has this decision been adequately explained and evidenced in both the consultation material and the final submission to the CAA, and is the rationale reasonable?	N/A
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being M1 change, impacts on tranquillity have been scoped out of the environmental assessment.	_
10.3	Summary of anticipated impact on tranquillity from the final proposed airspace change.	
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being scaled as a Level M1 change, impacts on tranquillity have been scoped out of the environmental assessment.	

11. Biodiv	versity [for Level 1 and Level M1 airspace change proposals]	Status
11.1	Has the impact on biodiversity been adequately assessed and presented in both the consultation material and the final submission to the CAA, taking account of scalability and proportionality?	N/A

	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being scaled as a Level M1 change, impacts on biodiversity have been scoped out of the environmental assessment.
11.2	If assessment of the impact on biodiversity has not been undertaken by the sponsor, has this decision been adequately explained and evidenced in both the consultation material and the final submission to the CAA, and is the rationale reasonable?
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being scaled as a Level M1 change, impacts on biodiversity have been scoped out of the environmental assessment.
11.3	Summary of anticipated impact on biodiversity from the final proposed airspace change.
	As stated in Q2.1, the sponsor has presented a rationale and supporting evidence to conclude that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being scaled as a Level M1 change, impacts on biodiversity have been scoped out of the environmental assessment.

12. Traf	fic Forecasts	Status
12.1	Have traffic forecasts been provided, are they reasonable, and have these been used to reflect the anticipated environmental impacts of the proposal?	YES
	This ACP is not expected to result in a change in the types or number of aircraft or airspace users in the impacte therefore the sponsor has only submitted one set of forecasts.	d airspace and
	The traffic forecast covers the opening year, 2023, until 2033 which is 10 years from the intended year of impler Projection to 2033 was performed using Eurocontrol's STATFOR October 2021 traffic forecast until 2027 and NA thereafter. The same traffic forecast was also used to estimate the impact of the activation of FCA on aircraft op airports from 2023 to 2033.	TS' extension
	An updated version of Eurocontrol's STATFOR traffic forecast from October 2023 for the 2023 to 2029 period is However, the traffic growth rate in latest version is similar to the one considered in the sponsor's assessment ar reassessment using the October 2023 forecast is unlikely to show any significant differences.	
	A traffic forecast for GA activities has not been provided. However, the sponsor concludes that this ACP is unlike	ly to impact GA

activities, and therefore, the CAA agrees that there is no requirement to develop this specific traffic forecast.

13. Con	sultation	Status
13.1	Has the sponsor taken account of any environmental factors (noise, CO ₂ emissions, Local Air Quality, tranquillity or biodiversity) raised by consultees or has evidence been provided to indicate why this has not been possible?	YES
	The sponsor's consultation activities are assessed in the separate CAA Consultation Assessment. This assessmen sponsor has taken account of all environmental factors raised by consultees.	t concludes that the
	Most consultees were concerned about additional track miles flown due to rerouting around the proposed DA, r increased fuel burn and CO ₂ emissions. It is acknowledged that certain reporting points/waypoints used by North At traffic routing via the Amsterdam and Copenhagen FIRs which are within the proposed DA will also become unavailable activation. The unavailability of these routes will thereby require GAT to reroute around the DA using longer alternative result in increased fuel burn and CO ₂ emissions. Therefore, the impacts caused due to the activation of FCA are assess when compared to a scenario where FCA is inactive and unrestricted routings are available. However, the baseline for assessment involves simultaneous activations of D323 and D613 which are replaced by an activation of FCA in the scenario. This comparison establishes that although a small number of flights may still continue to be negatively specific reroutes (e.g., between Newcastle/Teesside and Aberdeen/Edinburgh airports), the overall impacts in te and CO ₂ emissions when considering all GAT impacted by FCA are assessed to be positive when compared to the values within the London/Scottish FIR boundaries.	lantic Tracks and le during its ve tracks which will ed to be negative or the CO ₂ e design option impacted on rms of fuel burn
	In this aspect, the sponsor has presented a quantitative assessment of fuel burn and CO ₂ emissions using DfT's Tannual totals and on a per flight basis which indicate a positive impact on CO ₂ emissions (i.e., savings) within the FIR boundaries. Note that it is unclear whether the airspace design also facilitates a decrease in fuel burn and CO ₂ emflight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entry/Exit London/Scottish FIR are different from those in the original flight plan. As this ACP is unlikely to impact GA activiting acts on CO ₂ emissions resulting from any such change in GA traffic patterns have been excluded from the CO	London/Scottish issions over entire Points to the ties, consequential
	Environmental factors were also raised by some consultees in relation to noise impacts. However, for ACPs spon environmental impacts that are a direct result of military aircraft or military operations (including civil aircraft cafunction under contract) are not required to be considered or assessed. However, consequential environmental airspace users (i.e., civil aviation) that are a result of the proposed change must be assessed. As stated in Q2.1, to presented a rationale and supporting evidence to conclude that there is no material change in traffic patterns of	irrying out military impacts from other he sponsor has

	below 7,000 ft. that are caused as a result of this ACP. Therefore, despite being scaled as a Level M1 change, ground based environmental impacts below 7,000 ft. (noise, local air quality, tranquillity and biodiversity) have been scoped out of the environmental assessment.	
13.2	Has the sponsor taken account of any consultation response submitted by ICCAN? If so, what are the outcomes?	N/A
	ICCAN did not provide a consultation response to this ACP. The Stage 3 consultation gateway was held in February 2023 and ICC was wound down at the end of September 2021.	

14. Public Evidence Session (if held)		Status
14.1	If a Public Evidence Session has been held, was any <u>new</u> evidence on potential environmental impacts presented?	N/A
	No public evidence session was held for this ACP.	
14.2	If so, was the new evidence relevant and material to the CAA's consideration of the environmental impacts of the submitted airspace change proposal?	N/A
	No public evidence session was held for this ACP.	

15. Com	pliance with policy and guidance from Government, ICCAN or the CAA	Status
15.1	Has the sponsor satisfied all relevant policy and/or guidance from either the Government, ICCAN or the CAA, with regards to environmental impacts of the proposed airspace change?	YES
	The sponsor has satisfied relevant policy and/or guidance with regards to environmental impacts of the propose few recommendations and conditions have been proposed in order to address the CAA's observations regarding and methodology used in the CO ₂ assessment. See Question 8.1 and Question 17.1.	,
	Any best practice guidance that has been issued by ICCAN specifically on the topic of consultation process/pract in the CAA's Consultation Assessment report rather than within this Environmental Assessment report.	ice will be considered

15.2	Has the sponsor adequately considered the DfT's Altitude-Based Priorities ⁴ ?	YES
	The sponsor has adequately considered the DfT's Altitude-Based Priorities and assessed all the required impacts for a noise being given priority over CO ₂ below 7,000 ft. However, as stated in Q2.1, the sponsor has presented a rational evidence to conclude that there is no material change in traffic patterns of other airspace users below 7,000 ft. It result of this ACP. Therefore, despite being scaled as a Level M1 change, ground based environmental impacts be local air quality, tranquillity and biodiversity) have been scoped out of the environmental assessment. In terms of sponsor has presented a quantitative assessment of fuel burn and CO ₂ emissions using DfT's TAG, including annuper flight basis. As this ACP is unlikely to impact GA activities, consequential impacts on CO ₂ emissions resulting change in GA traffic patterns have been excluded from the CO ₂ assessment.	ale and supporting that are caused as a selow 7,000 ft. (noise, of CO ₂ emissions, the ual totals and on a

16. Other aspects		Status
16.1	Are there any other aspects of the airspace change proposal that have not already been addressed in this report but that may have a bearing on the environmental impact?	N/A
	There are no further aspects of the airspace change proposal that have not already been addressed in this report but that may hav a bearing on the environmental impact.	

17. Reco	ommendations/Conditions/PIR Data Requirements	Status
17.1	Are there any Recommendations which the change sponsor should try to address either before or after implementation (if approved)? If yes, please list them below.	YES
	 The sponsor should try to address the following recommendations before implementation of the ACP (if approved): Update the traffic forecasts using the most up-to-date and credible, clearly referenced sources of data (e.g., Eurocontrol's STATFOR October 2023) 	
17.2	Are there any Condition(s) which the change sponsor <u>must fulfil</u> either before or after implementation (if approved)? If yes, please list them below.	YES

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⁴ Paragraph 3.3, DfT's Air Navigation Guidance 2017

	The sponsor must fulfil the following conditions either before or after implementation of the ACP (if approved):			
	 Confirm whether the airspace design also facilitates a decrease in fuel burn and CO₂ emissions over entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entry/Exit Points to the London/Scottish FIR are different from those in the original flight plan Provide an explanation for the split of traded and non-traded sector emissions considered in the TAG Greenhouse Gases Workbook 			
	 Update the TAG Greenhouse Gases Workbook using input values for tCO₂e that are based on 55 activations of FCA 			
17.3	Are there any specific requirements in terms of the data to be collected by the change sponsor for the Post Implementation Review (if approved)? If yes, please list them below.			
	The sponsor should collect the following data for the Post Implementation Review (if approved):			
	Number, timings, and duration of the Danger Area activation			
	Number, type, and trajectories of aircraft rerouting around the Danger Area			
	 A re-assessment of fuel burn and CO₂ emissions using DfT's TAG with actual data if any of the assumptions considered in the assessment as presented in the final submission have changed after implementation of the ACP 			
	 Confirmation that there are no impacts to civil traffic patterns below 7,000 ft. beyond those identified in the final submission 			

18. Summary of Assessment of Environmental Impacts & Conclusions

This ACP seeks to secure an appropriate volume of permanent segregated airspace i.e., FCA, extending from FL85 to FL660 located on the Eastern coast of the UK (Northeast England/Southeast Scotland). FCA will be used to safely facilitate occasional large scale, highly complex, multi-domain tactical collective training exercises for the UK Armed Forces.

The ACP is scaled as a Level M1 as it has potential to alter civil aviation traffic patterns below 7,000 ft. over an inhabited area and is being sponsored by the MoD. For Level M1 ACPs, the CAA is directed to disregard the environmental impacts that are a direct result of military aircraft or military operations (including civil aircraft carrying out military function under contract). However, consequential environmental impacts from other airspace users (i.e., civil aviation) that are a result of the proposed change must be assessed in accordance with Level 1 requirements.

Despite being scaled as a Level M1 change, the CAA accepts the sponsor's rationale and supporting evidence and concludes that there is no material change in traffic patterns of other airspace users below 7,000 ft. that are caused as a result of this ACP. Therefore, ground based

environmental impacts below 7,000 ft. (noise, local air quality, tranquillity and biodiversity) have been scoped out of the environmental assessment. As this ACP is unlikely to impact GA activities, consequential impacts on CO₂ emissions resulting from any such change in GA traffic patterns have also been excluded from the environmental assessment.

It is acknowledged that certain reporting points/waypoints used by North Atlantic Tracks and traffic routing via the Amsterdam and Copenhagen FIRs which are within the proposed DA will also become unavailable during its activation. The unavailability of these routes will thereby require GAT to reroute around the DA using longer alternative tracks which will result in increased fuel burn and CO₂ emissions. Therefore, the impacts caused due to the activation of FCA are assessed to be negative when compared to a scenario where FCA is inactive and unrestricted routings are available.

However, the baseline for the CO₂ assessment involves simultaneous activations of D323 and D613 which are replaced by an activation of FCA in the design option scenario. This comparison establishes that although a small number of flights may still continue to be negatively impacted on specific reroutes (e.g., between Newcastle/Teesside and Aberdeen/Edinburgh airports), the overall impacts in terms of fuel burn and CO₂ emissions when considering all GAT impacted by FCA are assessed to be positive when compared to the modelled baseline values within the London/Scottish FIR boundaries.

In terms of impacts on IFR flight paths and resulting CO_2 emissions, the sponsor's assessment predicts a decrease in average fuel burn per flight of 78 kg, leading to a decrease in average CO_2 e emissions per flight of 249 kg within the London/Scottish FIR boundaries. In terms of total emissions, the sponsor's assessment predicts a decrease by 1,700 t CO_2 e in 2023 and by 1,901 t CO_2 e by 2033, an annual decrease of 2% from baseline values. For the appraisal period between 2023 – 2033, this amounts to an estimated total saving of 19,911 t CO_2 e.

Note that it is unclear whether the airspace design also facilitates a decrease in fuel burn and CO₂ emissions over entire flight trajectories (including those outside the London/Scottish FIR boundaries) in cases where the Oceanic Entry/Exit Points to the London/Scottish FIR are different from those in the original flight plan.

The sponsor has presented a TAG assessment using DfT's Greenhouse Gases Workbook (version May 2023). However, the tCO₂e values from 2023 to 2033 that are used as input data in the workbook are based on 32 activations of FCA, instead of 55.

The sponsor also lists several mitigation measures that will be implemented to minimise the scale of impacts on other airspace users. FCA will be activated only when necessary and therefore impacts are only anticipated during such specific activation times of the DA. LoAs will also be signed with impacted stakeholders and will include procedures to minimise potential disruption, details on alternative routing instructions and options, advance planning of entry and egress routes, transfers, agreements on the provision of sufficient notice periods to stakeholders, DA activation and cancellation processes, guarantee of service provision and publication of detailed entry and exit points and associated transit routes of military aircraft. Agreement of FCA activation times that are deconflicted with peak operating hours at the airports will also be clearly stated and shared with all stakeholders. Additionally, a bespoke service and specific air traffic service procedures will be applied to aircraft both inbound to and outbound from Newcastle and Teesside airports and routing via reporting point CUTEL as aircraft transit to and from the Copenhagen FIR. Airspace sharing procedures will be managed by the UK AMC.

Environmental assessment sign-off	Name	Signature	Date
Environmental assessment completed by Airspace Regulator (Environment)			24/11/2023
Environmental assessment reviewed by Airspace Regulator (Environment)			27/11/2023
Environmental assessment conclusions approved by Manager AR			27/11/2023
Environmental assessment conclusions approved by Head AAA			27/11/23