

CAA Environmental Assessment and Statement

Title of airspace change proposal	Llanbedr airspace (Danger Area)
Change sponsor	Snowdonia Aerospace LLP
Project no.	ACP-2019-058
SARG project leader	[REDACTED]
<i>Case study commencement date</i>	18 Feb 2021
<i>Case study report as at</i>	14 Apr 2021
<p>Instructions</p> <p>In providing a response for each question, please ensure that the ‘status’ column is completed using one of the following options:</p> <ul style="list-style-type: none"> • yes • no • partially • n/a <p>To aid the SARG project leader’s efficient project management, please highlight the “status” cell for each question using one of the three colours to illustrate if it is:</p> <p>resolved Green not resolved Amber not compliant Red</p>	
<p>1. Introduction</p> <p>This CAA environmental assessment and statement describes the considerations relevant to Snowdonia Aerospace Centre’s (‘The Sponsor’) proposal for a permanent Danger Area (DA) situated at and in the vicinity of Llanbedr Aerodrome (EGFD), Gwynedd, north-west Wales. The permanent Danger Area is proposed to provide:</p> <ul style="list-style-type: none"> • An area of segregated airspace local to Llanbedr Aerodrome for the research, development, test and evaluation (RDT&E) of novel aerospace systems; and • An air corridor to link Llanbedr Aerodrome with the existing Danger Area D201 for extended range, altitude and endurance testing. <p>So that only the minimum amount of segregated airspace necessary to meet operational requirements will be used at any given time the sponsor has divided the proposed Danger Area into 11 areas. This proposal is for a smaller series of areas than was approved as a temporary Danger Area, which, has been in use as required since 2015.</p>	

2. Nature of the Proposed Change		Status
2.1	<p>Is it clear how the proposed change will operate, and therefore what the likely environmental impacts will be?</p> <p>The sponsor proposes the creation of a permanent Danger Area, to provide segregated airspace for the research, development, testing and evaluation of novel aerospace systems, most of which will be unmanned aerial system (UAS) operations.</p> <p>The sponsor considered three options:</p> <ol style="list-style-type: none"> 1) An option with a Danger Area made up of four areas; 2) An option with a Danger Area made up of 11 areas; and 3) Do nothing. <p>The final proposed airspace design is Option 2 and following consultation the sponsor amended Option 2 changing the geometry of some of the areas to better address the needs of other airspace users.</p> <p>Consequently, the sponsor proposes the creation of a permanent Danger Area, made up of 11 areas, A to F, that when operational will restrict the airspace within the operational areas to novel aerospace systems for research, development, test and evaluation. Areas A, E and F are partially or entirely over land in the vicinity of the aerodrome, whereas areas C and D are entirely offshore. Area A surrounds the aerodrome. Area B largely surrounds the aerodrome before extending to the west and over the sea, area E is situated to the east of the aerodrome, and segment F is situated to the north of the aerodrome. The six areas are further broken down into sub-areas, from surface to 2,000 ft AMSL (areas A1, B1, C1, E1), and 2,000 to 6,000 ft AMSL (areas, A2, B2, C2, D2 and E2 and F2).</p> <p>The sponsor estimates that the Danger Area will be activated on approximately 100 days per year and will permit around 200 novel aerospace system flights per annum, representing an annual daily usage of less than 1 flight per day. For context, Llanbedr Aerodrome handled 900 total aircraft movements during 2019.</p> <p>The sponsor acknowledges that it is challenging to estimate the utilisation of areas within proposed danger area, but estimated the usage shown in Table 2 (from the ACP submission document), based on 100 days of Danger Area activation per year:</p>	Yes

DA sub area	No. days of activation
Area A (over the aerodrome)	107
Area B (inshore)	35
Area C (offshore corridor toward D201)	12
Area D (offshore corridor toward D201)	12
Area E (toward Rhinog mountains)	6
Area F (coastal lowland / Harlech)	6
Max. altitude <2000ft	71
Max. altitude <6000ft	36

Table 2 - Estimate of DA annual daily usage

Note in Table 2, the numbers of activations by area are of sub-sets one another, and assume operation begins and ends at Llanbedr Aerodrome, thus areas B to F cannot be activated without area A. The number of activations by altitude covers all areas (A-F).

The ACP submission document goes on to illustrate anticipated usage of combinations of sub-areas and the likely number of days that these are expected to be operational. The numbers reflect a forecast of UAS operations up to 2024, a few years after the Danger Area may become operational. The sponsor did not provide a forecast of usage 10 years later, but states they “would expect a small but increasing number of space-related activities to increase the proportion of operations using the air corridor to connect to the D201 Cardigan Bay Range.” This increase in traffic is considered a reasonable assumption.

The sponsor does not provide further information on the indicative flight routes within each Danger Area sub-area, nor flight altitudes, but does break down anticipated usage into the Danger Area sub-areas, which include two altitude bands, 0-2,000 ft and 2,000-6,000 ft.

The sponsor anticipates a variety of novel aerospace systems will make use of the Danger Area, including balloons, but the majority are anticipated to be drones, including both electric and combustion engine powered drones. The option appraisal states that most systems will be less than 150kg (for context, microlights may be up to 300kg or 450kg for single and two seat microlights in the UK). It also states that at least 50% are expected to be electric powered. Both statements are reasonable.

3. Secretary of State Call-in Noise Criterion		Status
3.1	<p>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?</p> <p>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 dB² <u>as well as</u> having an identified adverse impact on health and quality of life.³</p>	Yes
	The proposal does not meet the Secretary of State’s criterion for call-in on noise impacts.	
4. Statement of Need		Status
4.1	<p>Does the Statement of Need include any environmental factors?</p>	Yes
	No. The primary need behind the proposal is to provide a safe and known situation for research, development, testing and evaluation of novel aerospace systems. However, the Statement of Need does acknowledge the need to take account of environmental factors and requirements.	
5. Design Principles		Status
5.1	<p>Does the final set of Design Principles include any environmental objectives?</p>	Yes
	<p>The sponsor adopted a total of ten design principles, two of which include environmental objectives:</p> <ul style="list-style-type: none"> • DP7 - Any impact on the environment and associated leisure activities should, where possible, be minimised via operating 	

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 L_{Aeq,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.

	<p>procedures and should, where possible, take account of any local development projects or noise sensitive areas that are highlighted as a result of stakeholder engagement.</p> <ul style="list-style-type: none"> • DP8 - The design should, where possible, take account of local planning policy including that of the Snowdonia National Park Authority and the aerodrome registered Safeguarding Map. 	
5.2	Does the proposal explain how and to what extent the final airspace design achieves any environmental Design Principles?	Yes
	<p>The ACP submission explains that the Design Principles were used to create the two proposed Danger Area options and further engagement then took place with stakeholders and interested participants that engaged on developing the Design Principles. The two options and the do-nothing option were then taken forward for full public consultation. The sponsor notes that the final design of the proposed Danger Area areas E and F vertical and horizontal boundaries <i>“will also allow us to minimise the impact on the environment, Snowdonia National Park and associated leisure activities.”</i> We agree with this conclusion.</p>	
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?	Yes
	No.	
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?	Yes
	<p>No. The sponsor considered that both Danger Area options equally met the design principles. Modifications made to Option 2 after consultation, were primarily to meet the needs of other airspace users, but indirectly better demark between offshore and onshore airspace over Snowdonia National Park, which, should facilitate clearer monitoring of use of Danger Area segments in more sensitive locations.</p>	

6. Options Appraisal		Status
6.1	Have environmental impacts been adequately reflected and assessed in the Options Appraisal?	Yes
	<p>Yes. The sponsor acknowledges the standard processes normally used to quantify noise exposure and the use of webTAG to assess noise impacts and states that these processes are not suitable for the types of vehicles expected to use the Danger Area. We agree with this. Additionally, webTAG requires assessment of average summer day 16-hour noise exposure. This noise metric is not suitable for assessments when the number of flight operations is less than 30 per average summer day and the sponsor expects an average of 2 flights per day. Even recognising the potential for a higher average summer day peak and the potential for RDT&E aircraft to overfly a location more than once, the number of operations anticipated is too low to be quantified through the use of webTAG, thus we agree with the sponsor's approach regarding webTAG.</p> <p>Instead, the sponsor provides flyover noise information for a variety of unmanned aircraft types and sizes. It acknowledges that multi-rotor unmanned aircraft could be perceived to be more annoying for a given noise level. The sponsor provided unmanned aircraft noise information for different distances/heights and compared these against a representative rural daytime ambient noise level of 45 dB L_{Aeq}. Whilst the sponsor notes that many of the smaller and electric powered UAS will generate noise levels similar to or below ambient noise levels, the sponsor presents information showing that larger vehicles will clearly be audible above ambient background levels. This is welcome. Although the noisiest vehicles operating will be clearly audible, they are forecast to represent less than half of the already small number of flights anticipated. Consequently, we support the finding, that the operation of the Danger Area is not likely to lead to adverse noise impacts.</p> <p>With regard to CO₂ impacts, the sponsor estimated the additional CO₂ emissions from the combustion-powered unmanned vehicle, based on its knowledge of operations using the temporary Danger Area introduced in 2015. This is reasonable.</p>	
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
	The sponsor makes no claim that the final option leads to different environmental impacts compared with Option 1. This is reasonable.	

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?	Yes
	<p>Yes. The sponsor acknowledges the standard processes normally used to quantify noise exposure and the use of webTAG to assess noise impacts and states that these processes are not suitable for the types of vehicles expected to use the Danger Area. We agree with this. Additionally, webTAG requires assessment of average summer day 16-hour noise exposure. This noise metric is not suitable for assessments when the number of flight operations is less than 30 per average summer day and the sponsor expects an average of 2 flights per day. Even recognising the potential for a higher average summer day peak and the potential for RDT&E aircraft to overfly a location more than once, the number of operations anticipated is too low to be quantified through the use of webTAG, thus we agree with the sponsor's approach regarding webTAG.</p> <p>Instead, the sponsor provides flyover noise information for a variety of unmanned aircraft types and sizes. It acknowledges that multi-rotor unmanned aircraft could be perceived to be more annoying for a given noise level. The sponsor provided unmanned aircraft noise information for different distances/heights and compared these against a representative rural daytime ambient noise level of 45 dB L_{Aeq}. Whilst the sponsor notes that many of the smaller and electric powered UAS will generate noise levels similar to or below ambient noise levels, the sponsor presents information showing that larger vehicles will clearly be audible above ambient background levels. This is welcome. Although the noisiest vehicles operating will be clearly audible, they are forecast to represent less than half of the already small number of flights anticipated. Consequently, we support the finding, that the operation of the Danger Area is not likely to lead to adverse noise impacts.</p>	
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?	Yes
	<p>Yes. The sponsor acknowledges the standard processes normally used to quantify noise exposure and the use of webTAG to assess noise impacts and states that these processes are not suitable for the types of vehicles expected to use the Danger Area. We agree with this. Additionally, webTAG requires assessment of average summer day 16-hour noise exposure. This noise metric is not suitable for assessments when the number of flight operations is less than 30 per average summer day and the sponsor expects an average of 2 flights per day. Even recognising the potential for a higher average summer day peak and the potential for RDT&E aircraft to overfly a location more than once (equivalent to additional operations), the number of operations anticipated is too low to be quantified through the use of webTAG.</p>	

7.3	Summary of anticipated noise impacts from the final proposed airspace change.	
	Although the sponsor acknowledges that larger unmanned aircraft anticipated to use the proposed Danger Area will lead to maximum noise levels above ambient background noise levels, the very low number of flight operations anticipated mean that adverse noise impacts are unlikely to occur as a result of the proposed Danger Area.	
8. CO₂ Emissions		Status
8.1	Has the impact on CO₂ emissions been adequately assessed and presented in both the consultation material and the final submission to the CAA, taking account of scalability and proportionality?	Yes
	<p>Yes. The sponsor notes that standard aviation tools for assessing aviation CO₂ emissions are not appropriate for estimating CO₂ emissions for novel aerospace systems. Instead it estimates CO₂ emissions based on fuel use from unmanned aircraft using the temporary Danger Area that has been in place since 2015. The sponsor has estimated CO₂ emissions, based on anticipated use of the proposed Danger Area, to be up to 3 tonnes per year. This is reasonable.</p> <p>The sponsor also considered the potential additional CO₂ emissions from other airspace users flying longer routes in order to fly around the Danger Area when active and considers the additional CO₂ emissions of other users to be negligible. This is reasonable.</p>	
8.2	If an assessment of the impact on CO₂ 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?	Yes
	n/a	
8.3	Summary of anticipated impact on CO₂ emissions from the final proposed airspace change.	
	The sponsor states that at least 50% of aircraft movements are expected to be electric powered and has estimated CO ₂ emissions, based on anticipated use of the proposed Danger Area, to be up to 3 tonnes per year. The sponsor also considered the potential additional CO ₂ emissions from other airspace users flying longer routes in order to fly around the Danger Area when active and considers the additional	

	CO ₂ emissions of other users to be negligible.	
9. Local 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?	Yes
	The sponsor acknowledges that the additional local air quality emissions would have a negligible impact on local air quality and since the airfield and the proposed Danger Area are located far from any Air Quality Management Areas (AQMAS) are therefore unlikely to lead to a breach of legal air quality limits. We agree with this approach and conclusion.	
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?	Yes
	The sponsor explained in its consultation document that the additional local air quality emissions would have a negligible impact on local air quality and since the airfield and the proposed Danger Area are located far from any Air Quality Management Areas (AQMAS) are therefore unlikely to lead to a breach of legal air quality limits. We agree with this approach and conclusion.	
9.3	Summary of anticipated impact on Local Air Quality from the final proposed airspace change.	
	Due to of the location of the airfield, the proposed Danger Area and the low number of operations anticipated in the Danger Area, the sponsor considers that proposal would have a negligible impact on local air quality. We agree with this approach and conclusion.	
10. Tranquillity [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?	Yes

	<p>The sponsor acknowledges that the airfield and proposed Danger Area is located in Snowdonia National Park and therefore has the potential to impact on tranquillity. It is considered that the impact on tranquillity is mitigated by the two environmentally focused Design Principles:</p> <ul style="list-style-type: none"> • DP7 - Any impact on the environment and associated leisure activities should, where possible, be minimised via operating procedures and should, where possible, take account of any local development projects or noise sensitive areas that are highlighted as a result of stakeholder engagement. • DP8 - The design should, where possible, take account of local planning policy including that of the Snowdonia National Park Authority and the aerodrome registered Safeguarding Map. <p>The sponsor has segmented the proposed Danger Area into 11 area and area E is located wholly within Snowdonia National Park. The sponsor recognises the sensitivity of the operations within area E and anticipates that area E will be used on less than 6 days per year. Whilst any operations over this area may cause disturbance, they will be very infrequent and it must be acknowledged that this area is currently categorised as Class G airspace and thus already open to general aviation activity.</p>	
10.2	<p>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?</p>	<p>Yes</p>
	<p>The sponsor addresses tranquillity in combination with overflight of Snowdonia National Park and as noted in 10.1, the anticipated use of Danger Area segments over tranquil areas is very low and the sponsor has adopted a multi-layered approach to minimise the impact including; minimising flights over tranquil areas, keeping flights as short as possible over tranquil areas, and assessing operating altitude of such flights to further reduce noise on the ground. This is reasonable.</p>	
10.3	<p>Summary of anticipated impact on tranquillity from the final proposed airspace change.</p>	
	<p>The sponsor acknowledges that flights over tranquil areas may lead to disturbance and developed a multi-layered approach to minimising these impacts.</p>	

11. Biodiversity [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?	Yes
	The sponsor considered the effect of its proposal on biodiversity and concluded that the proposed Danger area will have negligible impact on biodiversity, since it will not involve ground-based infrastructure. This is reasonable.	
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?	Yes
	The sponsor's approach to considering biodiversity was presented in its consultation document as explained in 11.1. This is reasonable.	
11.3	Summary of anticipated impact on biodiversity from the final proposed airspace change.	
	The sponsor considers that the proposal will have negligible impact on biodiversity. This is reasonable.	
12. Traffic 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
	The sponsor has estimated usage of the Danger Area out to 2024. It further states that it <i>"would expect a small but increasing number of space-related activities to increase the proportion of operations using the air corridor to connect to the D201 Cardigan Bay Range."</i> The forecast neither represents a first year of operation of the Danger Area, nor ten years later. Nevertheless, the small number of activations forecast, and the small number of flights forecast on any given activation day, indicate that a higher number associated with a ten year forecast, would be unlikely to alter the conclusion that the proposal is unlikely to lead to adverse environmental impacts.	

13. Consultation		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 provided feedback on consultation and engagement and noted that no concerns were raised regarding noise factors. Through separate engagement, local residents raised concern regarding overflight of local properties. The sponsor has committed to a multi-layered approach to avoid overflight of buildings and property.	
13.2	Has the sponsor taken account of any consultation response submitted by ICCAN? If so, what are the outcomes?	Yes
	ICCAN were not included as a consultee and therefore no response was received from them.	
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 has been held.	
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 has been held.	



15. Compliance 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
	This ACP is concerned with airspace design below 7,000 ft and has been accordingly considered as a Level 1 ACP. The change sponsor has complied with all relevant requirements as listed within CAP 1616 for a Level 1 ACP.	
15.2	Has the sponsor adequately considered the DfT's Altitude-Based Priorities ⁴ ?	Yes
	The sponsor has taken into account the DfT's Altitude-Based Priorities to the extent possible, in so far that it prioritised noise below 7,000, between 4,000ft and 7,000 ft the assessed CO ₂ impacts did not differ between options and where practicable it minimises impacts of overflying AONBs and National Parks below 7,000ft.	
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?	Yes
	None.	
17. Recommendations/Conditions/PIR Data Requirements		Status
17.1	Are there any Recommendations which the change sponsor <u>should try</u> to address either before or after implementation (if approved)? If yes, please list them below.	Yes

⁴ Paragraph 3.3, DfT's Air Navigation Guidance 2017

	The sponsor is encouraged to develop a means of notifying local residents about forthcoming days when the Danger Area will be activated, for example on their website or through social media. See sections 4.12 to 4.13 of the Air Navigation Guidance 2017.	
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.	No
	None.	
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.	Yes
	The sponsor must monitor and record usage of the Danger Area segments A to F (and the altitude subdivisions if practical to do so) and provide this information to the CAA for consideration as part of the PIR.	

18. Summary of Assessment of Environmental Impacts & Conclusions	
<p>The proposed airspace change is to introduce a permanent Danger Area, to replace a temporary Danger Area that has been available since 2015. The proposed Danger Area comprises of six segments, one segment overhead Llanbedr aerodrome, with the remaining segments to the west, out to sea, to the north and south, and to the east over Snowdonia National Park. The Danger Area will provide segregated airspace for the research, developing, test and evaluation of novel aerospace systems, mostly Unmanned Aircraft Systems (UAS).</p> <p>The sponsor anticipates that by 2024, the Danger Activation will be activated approximately 100 times per year and on average two flights will occur during each activation, with most occurring directly overhead or nearby the aerodrome. The sponsor anticipates that the most sensitive segment, over Snowdonia National Park, will be activated 4-6 times per year, and proposes a multi-layered approach to minimise use of this segment, minimise flying time in this segment where it is deemed necessary and maximise flight altitude to mitigate noise impacts.</p> <p>Although noise levels generated by the largest drones anticipated to be operated will be above background levels, the small number of events means that they are unlikely to lead to long-term adverse impacts. Because at least 50% of the movements are expected to be electric powered, additional direct CO₂ emissions resulting from operations within the proposed Danger Area are estimated to be 3 tonnes per year, and thus have a negligible overall impact on aerodrome CO₂ emissions. All other impacts were also considered to be negligible.</p>	

Outstanding issues?		
Serial	Issue	Action required
None		

Environmental assessment and statement sign-off and approval	Name	Signature	Date
Environmental assessment and statement completed by:	<i>CAA Chief Technical Noise Advisor</i>		19/04/2021
Environmental assessment and statement approved by:	<i>Airspace Regulator (Environment)</i>		19/04/2021