NATIONAL POLICE AIR SERVICE

NPAS BVLOS Trial

Engagement Material

Stage 3 Consult / Engage

ACP-2024-035

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Referenced Documents

Ref No	Name and description	Links
1	CAP1616: The Process for Changing the Notified Airspace Design	Link to CAP1616
2	CAP1616g: Guidance on Airspace Change Process for Temporary and Trial Airspace Change Proposals	Link to CAP1616g
3	Airspace Change Portal Page for ACP-2024-035	Link to Website
4	CAP1616i: Environmental Assessment Requirements and Guidance for Airspace Change Proposals	Link to CAP1616i
5	CAP2533: Airspace Policy Concept – Airspace Requirements for the Integration of Beyond Visual Line of Sight (BVLOS) Unmanned Aircraft	Link to CAP2533

1. Introduction

1.1 Purpose

1.1.1 This engagement material provides information on the NPAS BVLOS Trial (ACP-2024-035). It includes details of the proposal, its potential impacts, and how stakeholders can provide feedback.

1.2 Background

1.2.1 This 6-month trial, sponsored by the National Police Air Service (NPAS), aims to support the integration of new airspace users by operating a Remotely Piloted Aircraft System (RPAS) Beyond Visual Line of Sight (BVLOS), alongside crewed aircraft.

1.2.2 The trial is part of a CAA Trial Sandbox to help develop and test the policy concept CAP2533 BVLOS (Reference 5). This is a series of airspace trials that alongside each trial sponsors own individual objectives, aims to collect data to help inform the production of new CAA policies on the integration of new airspace users through the application of real-life use cases.

1.3 ACP Progress

1.3.1 The NPAS BVLOS Trial is following CAP1616, the CAA's Airspace Change Process (Reference 1) as well as CAP1616g, Guidance for Temporary and Trial Airspace Changes (Reference 2). The Airspace Change Proposal (ACP) is currently in Stage 3, Consult/Engage, and full progress can be found on the CAA's Airspace Change Portal (Reference 3).

1.4 Engagement to Date

1.4.1 Various stakeholders have been engaged during earlier stages of the CAP1616 process. This early engagement has taken place to obtain necessary inputs for assessments and option development.

1.4.2 This includes liaising with Natural England for input to the Habitat Regulation Assessment (HRA) Screening as recommended in CAP1616i (Reference 4). Due to a subsequent change to the TRA design which now involves overflying both England and Wales, the HRA Screening has been updated. Natural England have been made aware of this change and Natural Resources Wales have now been contacted.

1.4.3 Preliminary conversations have occurred to determine the feasibility and operability of the trial with various organisations including the Air Ambulance, Avonmouth Helipad and Bristol ATC.

1.5 Proposal Overview

1.5.1 This 6-month trial is expected to commence on 29th May 2025 and end on 12th November 2025, a duration of 24-weeks. Although this is our target timeframe, the start date may be delayed by up to a month as we consider stakeholder feedback and progress through the CAP1616 process.

1.5.2 The trial will utilise a Temporary Reserved Area (TRA) and identical Transponder Mandatory Zone (TMZ) to create an environment where NPAS can replicate current day operations using a RPAS. Figure 1 below shows the proposed TRA and TMZ, including safety buffers and launch/landing site. Both the TRA and TMZ will have the same dimensions and will always be activated together.

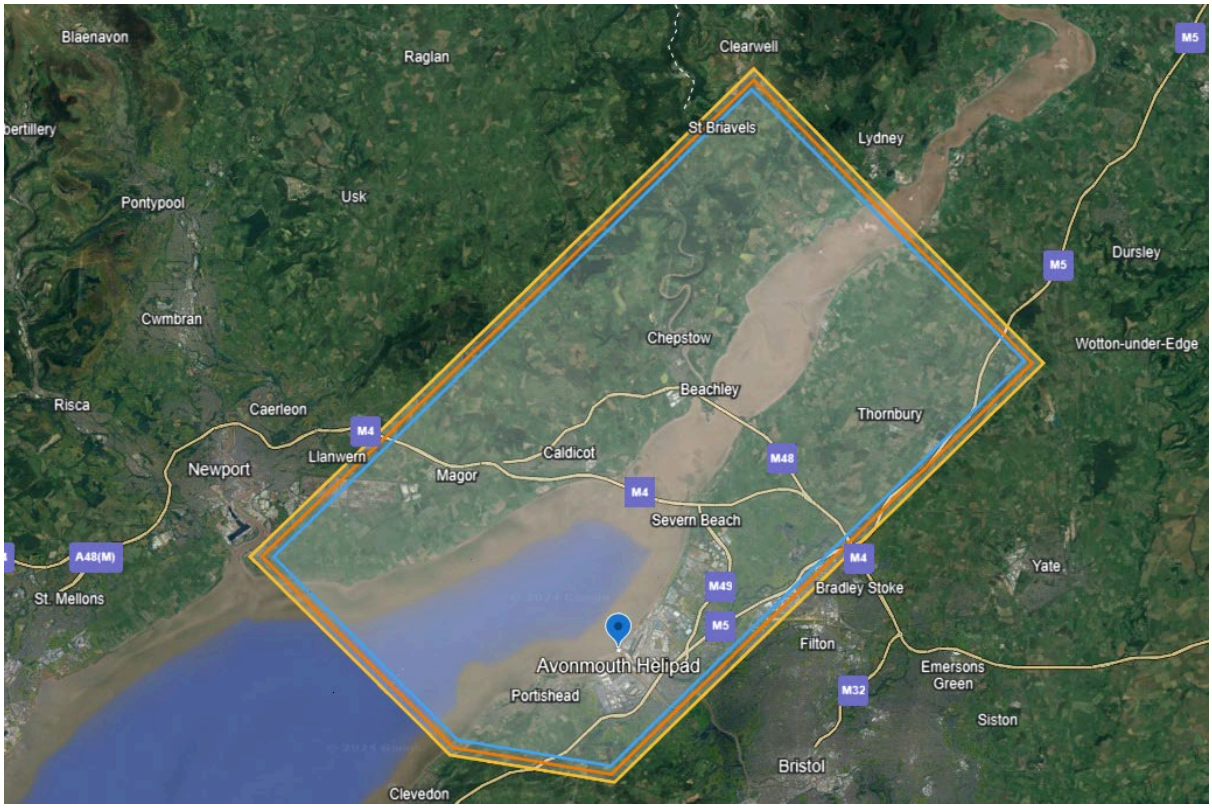

Figure 1: Proposed TRA shaded white with safety buffers indicated with yellow, orange and blue lines, Avonmouth Helipad launch/landing site marked with blue pin, presented over Google Earth background.

1.5.3 The TRA and TMZ will be split into two segments so that only the minimum amount of airspace required is used at any time. The trial activities/operations will occur in phases with specific criteria being met before progressing to the next phase of operations.

1.5.4 The RPAS to be used is an uncrewed aircraft with a rotary wing, weighing 200kg (maximum take-off mass) and powered by a single-disc Wankel rotary engine (Jet A-1) enabling it to remain airborne for up to 6hours (based on international standard atmosphere conditions, with a payload of up to 34kg).

1.5.5 The aircraft will be operated by qualified and licensed pilots provided by the RPAS supplier. NPAS pilots will provide local knowledge and be trained to support the activities during later trial phases. NPAS pilots will only operate the aircraft under supervision of the RPAS suppliers qualified pilots. Full details of the proposed TRA, TMZ, aircraft, trial phases and activities can be found in Section 4.

2. Objectives

2.1 Trial Objectives

2.1.1 There are several aims of this trial:

- Provide the CAA with data to aid the development of new policies for the integration of new airspace users.
- Conduct trial operations to determine if RPAS can be an effective addition to existing crewed aircraft for emergency services by:
    - Assessing strengths and weaknesses of operating the required NPAS payloads on a remote platform.
    - Operating the RPAS alongside crewed aircraft.
    - Determining if crewed NPAS operations can be replicated with a RPAS.
    - Training NPAS pilots in order that they can perform sorties (under supervision) with the aircraft and feedback comparisons to the crewed fleet on areas such as fatigue, potential risk management issues and spatial awareness.
    - Assessing the feasibility of using onboard radar as an element of a detect and avoid system which will detect uncooperative aircraft.

2.2 Measures of success

2.2.1 NPAS will determine if the trial has been successful in meeting these objectives by assessing:

- Whether the trial has collected sufficient data on the aspects described in 2.1.1.
- Suitable data collected to allow NPAS to evaluate and determine if RPAS can deliver police air support remotely.
- Sufficient data collected to enable the next phase of RPAS and remote policing requirements to be developed, based on trial findings. For example, identifying the strengths and weakness (from an NPAS perspective) of the equipment used for the trial.
- Ability to describe any differences in human factors when comparing remote policing operations with current crewed NPAS operations.
- Determine if onboard radar can be used to detect other aircraft.

3. Current Airspace

3.1 Overview

3.1.1 Avonmouth Helipad will be used as the launch / landing site for the RPAS vehicle within this trial. It is located on the edge of the Severn Estuary, providing easy access to both overwater and overland flying.

3.1.2 The proposed TRA is in Class G airspace, up to 4,000ft above mean sea level (amsl). There are two restricted areas, as shown in Figure 2.[1].

[1] Although this is the 2022 map (the most recent map will be provided in the final ACP submission) it is believed to still provide sufficient accuracy to allow you to assess the impacts on yourself / operation. Comparing the 2022 map and the most current map (at time of writing) the obstacle to the north of the helipad is no longer 453ft (amsl) but has increased to 516ft (amsl).

Figure 2: Current airspace displayed on a 1:250k VFR chart (2022) with proposed TRA and TMZ outlined in red, Avonmouth Helipad circled in yellow.

3.2 Current NPAS Operations

3.2.1 NPAS currently operates crewed aircraft within the TRA volume at c. 600 to 1,000ft above ground level (agl), excluding take-off and landing. NPAS has one helicopter at the Almondsbury base and are licensed to fly as needed 24hrs, 7 days a week. These crewed operations will continue as normal throughout the duration of this trial.

3.3 Current non-NPAS Airspace Usage

3.3.1 NPAS is aware of a number of other users of this airspace including gliders, model flyers, and General Aviation (GA). These known airspace users are being targeted throughout our Stage 3 engagement. Representative organisations part of the National Air Traffic Management Advisory Committee (NATMAC) are also being engaged so that views of any stakeholders we do not hold contact information for can be captured.

3.4 Current Airspace Structures

3.4.1 There are two restricted areas within the TRA, R154 and R155 are decommissioned power stations.

3.4.2 There are three significant visual reference points: M4 Prince of Wales Bridge, M5 Avon Bridge, and M48 Severn Bridge.

3.4.3 The northern TRA sector is within Class G airspace from surface to c 7,500ft amsl and the southern TRA sector is within Class G from surface to 4,000ft amsl.

4. Proposed Airspace and Activities

4.1 Proposed Airspace

4.1.1 A TRA has been designed to enable the safe BVLOS operation of a RPAS from Avonmouth Helipad.

4.1.2 This TRA has been split into two-segments to enable individual areas to be activated as required. The location and segmentation of the TRA can be seen in Figure 3 below. The coordinates for the proposed TRA are shown in Table 1. Please note, these are subject to change post-engagement and neither Table 1 or Figure 3 should be used for flight planning purposes. The final TRA design will be included in the ACP submission.

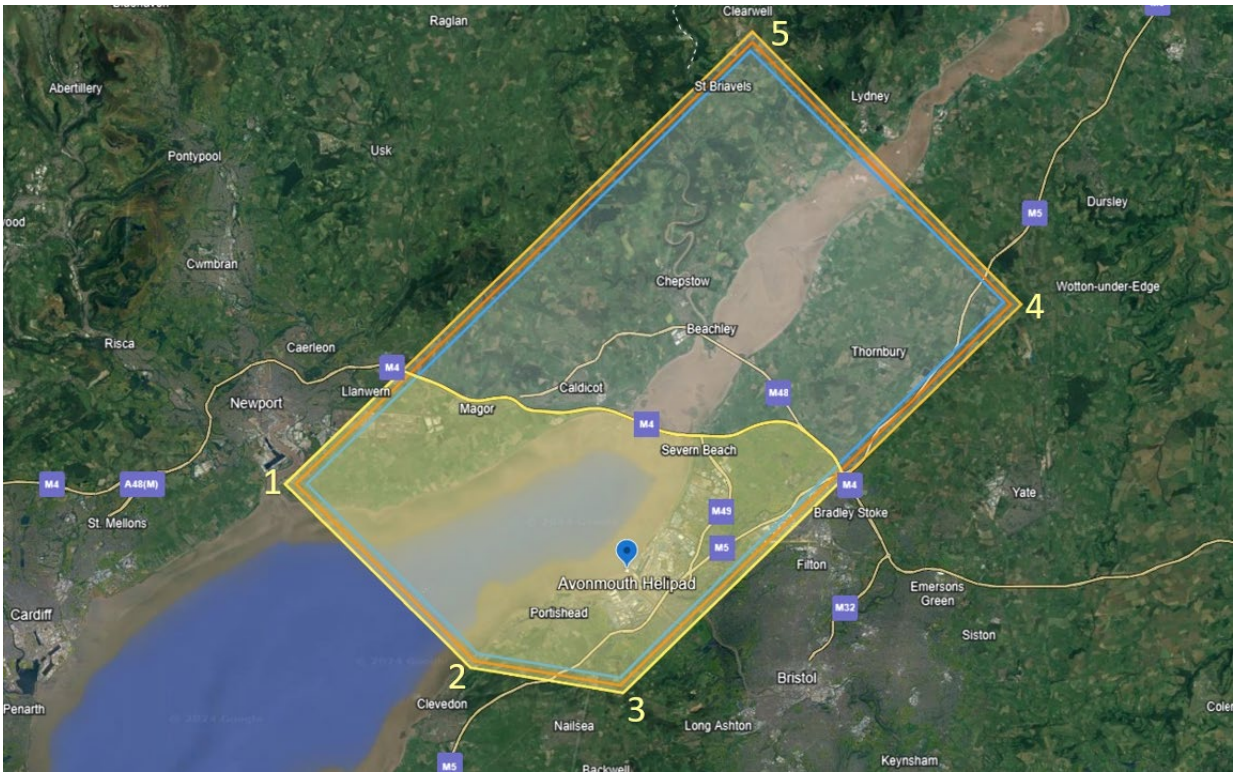

Figure 3: Proposed TRA and TMZ indicated by yellow outline with southern segment (south of the M4 motorway bridge) shaded yellow, presented over Google Earth background. The numbers represent the points shown in Table 1.

Table 1: Coordinates of proposed TRA

Point	Latitude	Longitude
1	51°32'46"N	2°58'33"W
2	51°27'35"N	2°50'05"W
3	51°26'53"N	2°43'08"W
4	51°37'51"N	2°24'58"W
5	51°45'35"N	2°37'13"W

4.1.3 The segments have been designed to follow local geographical areas to aid navigation using the M4 Prince of Wales Bridge as the division point. It is not possible to only activate the segment north of the bridge (as there would be no access from the launch site to this area). Therefore, either the segment south of the bridge, or the entire TRA will be activated. The activation area will be clearly explained via NOTAM at least 24 hours in advance.

4.1.4 The vertical limits of the TRA are from the surface to 1,700ft amsl.

4.1.5 Transit through restricted areas R154 and R155 will be requested.

4.2 Activity overview

4.2.1 All operations will occur between c 900ft and 1,200ft amsl and the RPAS will typically transit at c 1,000ft amsl. Routes to be flown will be pre-planned and Bristol ATC will be notified ahead of launch.

4.2.2 The majority of activities will occur during nighttime hours, 22:00 – 04:00 local time, with daytime operations in the final stage.

4.3 Trial Stages

4.3.1 The trial will be carried out in phases with different activities occurring within each stage. Note that stages 1 to 4 will be nighttime (22:00 – 04:00 local time) operations. Stage 5 will be the only stage to include daytime (10:00 – 15:00 local time) operations.

4.3.2 Stage 1 – The RPAS will be tested at the launch/landing site at Avonmouth Helipad. This will involve checking that systems work as expected. Any flying will be within Visual Line of Sight (VLOS), whilst training the NPAS team on pre- and post-flight activities and vehicle specific safety measures. All ground equipment will also be checked, and crew briefed on these. This stage should last no longer than two-weeks. VLOS operations do not require a TRA, however, for safety reasons, the southern part of the TRA / TMZ will be activated and there will be no access granted for aircraft not participating within the trial. The exception to this would be for cooperative aircraft which require access including but not limited to military and emergency services.

4.3.3 Stage 2 – These flights shall initially be short duration flights, over the estuary and within VLOS of the launch site. As per Stage 1, the southern part of the TRA / TMZ will be activated for these activities. The flights will switch to BVLOS and increase in duration up to 2 hours for shakedown testing. This will occur over the Severn Estuary and within the southern sector of the TRA. These flights shall be used to assess the vehicle capability, flight envelope and failure modes away from the base of operations. This stage should last two-weeks. For safety reasons, there will be no access granted for aircraft not participating within the trial except for cooperative aircraft which require access as stated in Stage 1.

4.3.4 Stage 3 – These BVLOS flights shall be longer duration, up to 6 hours, depending on payload. With confidence in the vehicle built from previous stages, the flights will initially operate in the southern TRA sector, but later may use either the southern sector or the full TRA. These flights will perform assessment of the radar units and their performance as a detect and avoid element, as well as provide assurance on the behaviour of the aircraft when other aircraft are detected via electronic conspicuity. This stage should last six-weeks. Access to the TRA may be granted to cooperative aircraft not participating in the trial, if agreed with NPAS. These aircraft will then need to contact Bristol ATC.

4.3.5 Stage 4 – BVLOS operations will occur over a larger area. Depending on the activity on the day, either the southern sector or full TRA will be activated. These flights are designed to replicate current NPAS crewed search operations (although operating from Avonmouth rather than NPAS Almondsbury base). This is expected to last twelve-weeks. Access to the TRA may be granted to cooperative aircraft not participating in the trial, if agreed with NPAS. These aircraft will then need to contact Bristol ATC.

4.3.6 Stage 5 – BVLOS operations (with visual observers for daytime flights) operating over the estuary. Daytime flights will only operate in the southern sector of the TRA (south of the M4 bridge). Night flights may be used to revisit any aspects of the trial requiring more activity. This stage is expected to last four-weeks. Daytime flying activities will be limited to no more than two-weeks Monday to Friday (ten flying days) between 10:00 - 15:00. Access to the TRA may be granted to cooperative aircraft not participating in the trial, if agreed with NPAS. These aircraft will then need to contact Bristol ATC.

4.3.7 These activities and timeframes correctly reflect NPAS' plan at the time of writing. However, flexibility will be required to account for weather, failed sorties, or other unplanned factors. Therefore, the timeframes and activities above are subject to change.

5. Impact Assessments

5.1 Airspace Users: Minimal

5.1.1 The trial is designed to minimise the impact on other airspace users. The proposed TRA has been sectorised to reduce the amount of airspace that is restricted at any one time and the majority of operations will occur during nighttime hours when airspace usage is at a minimum.

5.1.2 Flights operating above 1,700ft amsl will be above all segments of the TRA and not impacted.

5.1.3 For any airspace user that does wish to enter the area whilst the TRA is active, their aircraft will need to be equipped with a suitable transponder, which broadcasts the location of the aircraft. They will also need to contact NPAS, using the details provided in the NOTAM, for agreement and then contact Bristol ATC. Bristol ATC will provide a service in accordance with CAP774 UK Flight Information Services, the pilot may request a basic service from Bristol ATC or any other local ANSP. It should be noted that during Stages 1 and 2 of the trial (as per Trial Stages) it is expected that any airspace user, not involved in the trial who does not require access, will not be allowed to enter the airspace.

5.1.4 Dates, time, and segment(s) of TRA activation and deactivation will be promulgated via NOTAM at least 24 hours in advance to ensure that airspace users are aware. If flying completes sooner than expected, then the TRA can be deactivated to further reduce disruption to other airspace users.

5.2 Noise: Minimal

5.2.1 It is anticipated that the noise impact from this trial will be minimal. The RPAS to be used in this trial is quieter than the crewed helicopter currently used by NPAS and will be equipped with a noise dampener to reduce noise output further.

5.2.2 When measured at a lateral distance of 25m the RPAS with dampener peaked at 82dB whilst a crewed NPAS helicopter (EC135) peaked at 98dB. Using the inverse distance law for sound pressure levels, the formula to determine how noise decays with distance, it has been calculated that at a distance of 1,000ft, typical transit altitude, the RPAS should emit 61dB. Although 61dB is marginally above the 60dB reference for nighttime noise, as per CAP1616i chapter 11, this is notably quieter than the current NPAS EC135 helicopter at 76dB.

5.2.3 In addition, as the RPAS is powered by a combustion engine, the frequency of sound emitted will not be as intrusive as alternative electric powered RPAS. Therefore, the 10dB tonal correction for RPAS vehicles (as described in CAP1616i, chapter 10) has not been applied in this instance.

5.2.4 Routes flown by the RPAS will be planned in advance and developed to minimise the number of properties overflown as an additional mitigation.

5.3 Environmental: Minimal

5.3.1 The airspace change process requires the identification and assessment of the potential impact of the proposal on any European Sites. These include:

- Special Areas of Conservation (SAC) and possible SACs
- Special Protection Areas (SPA) and potential SPAs
- Ramsar Sites and proposed RAMSAR sites
- Compensatory habitats

5.3.2 NPAS has completed the Habitats Regulations Assessment – Early Screening Criteria provided in CAP1616i (Reference 4) and determined that the proposed trial activities would lead to additional aircraft movements over the Severn Estuary, which is a European Site.

5.3.3 However, as the site is current overflown by NPAS crewed aircraft and trial operations would not occur below altitudes currently flown, no significant impact is anticipated.

5.3.4 There are other European Sites within the TRA, but these will be geofenced and not overflown. Therefore, these sites will experience no impact.

5.4 Airfields, Airports and Air Navigation Service Providers (ANSPs): Minimal

5.4.1 The closest airport to the trial area is Bristol Airport located 7.5 nautical miles (nm)[2] to the South-east of Avonmouth Helipad. Due to the altitude of proposed operations within this trial, no significant impact is expected.

5.4.2 Bristol ATC (NATS) is the ANSP for the lower airspace in the vicinity. As this ANSP already provides a basic service to crewed NPAS operations, no significant impact is anticipated.

5.4.3 Cardiff Airport is located 24.5nm to the South-west of Avonmouth Helipad, no significant impact is anticipated.

5.4.4 Avon Model Aero Radio Club (AMARC) 2002 and Bristol Radio Control Model Aircraft Club (BRCMAC) are located within the TRA. The TRA is also near South Wales Gliding Club, Landit RC and Badminton Airfield (13.5nm, 15nm, and 16nm from Avonmouth Helipad respectively).

5.4.5 The impacts of the TRA, on these users, is expected to be minimal as most of the trials will operate overnight, when many GA aircraft are not licenced to operate. Daytime flying activities will be limited to no more than two-weeks Monday to Friday (ten flying days) between 10:00 - 15:00.

[2] Distances are measured in a straight line, rounded up to the nearest 0.5nm.

6. How to respond

6.1 Providing feedback

6.1.1 We appreciate our stakeholders time in considering this proposed airspace trial and would like to hear your feedback.

6.1.2 Any feedback should be sent to NPAS via the following e-mail address: npas.futures@npas.police.uk

6.1.3 If you believe this trial will have no impact on your operation or activities, a response stating that would be useful feedback. If you do not wish to provide any feedback, we request that you still respond to state "no comment".

6.1.4 The engagement period will end on Sunday 22nd of December 2024 and NPAS cannot guarantee that responses received after this date will be considered.

6.2 Feedback Considerations

6.2.1 The below set of questions has been developed to aid stakeholders when considering the proposal and what feedback they may wish to provide. Use of these questions is optional, and all feedback received via the mechanisms described in Section 6.1 above, will be analysed.

Question 1: Do you have any comments on the TRA/TMZ dimensions? Laterally and/or vertically?

Question 2: Do you have any comments on the proposed TRA segmentation?

Question 3: Do you agree that the proposed trial will have minimal impacts as outlined in Section 5 Impact Assessments?

Question 4: Do you agree that nighttime (22:00 – 04:00) will reduce disruption to other airspace users?

Question 5: Do you have any comments on the phased approach to this trial?

Question 6: Is there any other feedback you would like us to know?

7. Next Steps

7.1 Responses

7.1.1 After the engagement period ends, feedback received will be analysed and categorised based on its relevance and potential impact on the proposed airspace trial. The trial area and operations will be finalised and submitted to the CAA in an Airspace Change Proposal (ACP) during Stage 4 of CAP1616. How feedback has informed any changes to the trial will be included within the ACP document.

7.1.2 Once approved, this trial plans to operate from 29th May 2025 to the 12th November 2025.

7.1.3 NPAS will continue to undertake regular engagement with stakeholders during the trial and report any complaints to the CAA.

8. Appendix A - Glossary

Abbreviation/Term	Full Term	Description
ACP	Airspace Change Proposal	An application to change airspace within the UK.
AGL	Above Ground Level	Height relative to the local terrain.
AMSL	Above Mean Sea Level	Height relative to the average sea level.
ATC	Air Traffic Control	The air navigation service provider.
BVLOS	Beyond Visual Line of Sight	Operation of a remotely piloted aircraft at a distance where the aircraft and its altitude cannot be clearly seen by the pilot without additional aids such as onboard cameras.
CAA	Civil Aviation Authority	Regulator of UK airspace.
Class G	Airspace Classification G	This is the least restrictive type of airspace in the UK.
European Site	European Site	Landscapes protected as SACs, SPAs, Ramsar sites or compensatory habitats.
HRA	Habitat Regulations Assessment	A test to see if a proposal would have a significant impact on European Sites.
IFR	Instrument Flight Rules	When an aircraft is operated under these rules it is maneuvered and navigated with sole reference to instruments in the aircraft.
NATS	NATS	Air navigation service provider.
NERL	NATS En-Route Limited	Air navigation service provider. Proving a regulated service for all high-level airspace in the UK.
NPAS	National Police Air Service	The sponsor of this airspace trial.
RPAS	Remotely Piloted Aircraft System	An aircraft that is operated from a distance.
Sortie	Sortie	A flight or mission starting when an aircraft takes off until the aircraft lands.
TMZ	Transponder Mandatory Zone	An area where aircraft need to be equipped with a transponder to enter.
TRA	Temporary Reserved Area	A defined volume of airspace that is temporarily reserved for a particular use and can be activated when required.

VFR	Visual Flight Rules	Flying using primarily visual references.
VLOS	Visual Line of Sight	Operation of a remotely piloted aircraft at a distance where the aircraft and its altitude can be clearly seen by the pilot without the need for additional aids.

End of NPAS BVLOS Trial: Engagement Material