Technical Appendix 4.6: Aviation Lighting Assessment

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1.1 Introduction

1.1.1 This Technical Appendix (TA) sets out an evaluation of the effects of the aviation lights of the Proposed Development on the visual amenity of the local area during times when the turbines are lit. The assessment is supported by:

- **Volume 1: Non-Technical Summary;**
  - Chapter 4: Landscape and Visual;
- **Volume 2: Environmental Impact Assessment (EIA) Report:**
- **Volume 3a: Figures (Figures 4.1 to 4.17)**;
- **Volume 3b: Visualisations (Figures 4.18.1 to 4.36.6)**;
- **Volume 4: Technical Appendices**:
  - TA 4.1: Landscape and Visual Impact Assessment Methodology;
  - TA 4.2: Operational and Under-Construction Sites within 25 km
  - TA 4.3: Landscape Assessment;
  - TA 4.4: Visual Assessment;
  - TA 4.5: Cumulative Assessment;
  - TA 4.7: Implications on Designated Landscapes; and
  - TA 4.8: Residential Visual Amenity Assessment.

Regulations and Guidance

1.1.2 As the proposed turbines would be over 150 m to blade tip, they are above the threshold for the Civil Aviation Authority (CAA) regulations for lighting[1][2]. The CAA has accepted an application for a reduced lighting scheme that includes:

- medium intensity steady red (2000 candela) lights on the hubs of Turbines 1, 3, 5, 6, 8, 9, 11, 16, 20, and 21;
- a second 2000 candela light on the hubs of the above turbines to act as alternates in the event of a failure of the main light (note that both lights would not be lit at the same time);
- the lights on these turbines to be capable of being dimmed to 10% of peak intensity when the lowest visibility, as measured at suitable points around the wind farm by visibility measuring devices, exceeds 5 km;
- infra-red lights to MoD specification installed on the nacelles of all turbines (note that dimming permission is applicable only to visible lights, not infra-red lighting). Intermediate level 32 candela lights are not required to be fitted on the turbine towers[3].

1.1.3 Infrared lighting as required by the Ministry of Defence (MOD) is not visible to the naked eye and is therefore not considered further in this assessment.

Guidance on Assessment of Lighting Effects

1.1.4 The *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (referred to hereafter as GLVIA3) (Landscape Institute, Institute of Environmental Management and Assessment, 2013)[4] recognises that sometimes there is a need for assessment of lighting effects for development (not solely wind farms) and includes the following guidance: *"For some types of development the visual effects of lighting may be an issue. In these cases, it may be important to carry out night-time 'darkness' surveys of the existing conditions in order to assess the potential effects of lighting and these effects need to be taken into account in generating the 3D model of the scheme. Quantitative assessment of illumination levels, and incorporation into models relevant to visual effects assessment, will require input from lighting engineers, but the visual effects assessment will also need to include qualitative assessments of the effects of the predicted light levels on night-time visibility.[5]"*

1.1.5 NatureScot guidance on the preparation of visualisations for wind farms relating to dark photomontages states: *"It is difficult to illustrate turbine lighting well in visualisations, although some recent examples which use photographs taken in low light conditions (just before or after sunrise / sunset) have been more useful."* And *"Where an illustration of lighting is required, a basic visualisation showing the existing view alongside an approximation of how the wind farm might look at night with aviation lighting may be useful.[6]"*

1.1.6 Regarding the selection of viewpoints for illustration of night time lighting, NatureScot states that illustration *"is only likely to be required in particular situations where the wind farm is likely to be regularly viewed at night (e.g. from a settlement, transport route) or where there is a particular sensitivity to lighting (e.g. in or near a Dark Sky Park or Wild Land Area). Not all viewpoints will need to be illustrated in this way."*

1.1.7 Advising on the preparation of images: *"The visualisation should use photographs taken in low light conditions, preferably when other artificial lighting (such as street lights and lights on buildings) are on, to show how the wind farm lighting will look compared to the existing baseline at night. It is only necessary to illustrate visible lighting, not infrared or other alternative lighting requirements. We have found that [photography taken at] approximately 30 minutes after sunset provides a reasonable balance between visibility of the landform and the apparent brightness of artificial lights, as both should be visible in the image. It is important that the photographs represent the levels of darkness as seen by the naked eye at the time and the camera exposure does not make the image appear artificially brighter than it is in reality. It can also be helpful to note the intensity of other lights in the area to enable comparison (e.g. television transmitters) as this can aid the assessment process."*

1.1.8 NatureScot, at a seminar on aviation lighting in November 2019, advised a proportionate and pragmatic approach to lighting assessments. NatureScot's view is that lengthy and detailed debate about the exact brightness of lights is not very helpful, and it is better to discuss relative brightness, and to focus on where they would be visible, and how they would change the baseline night view. However, it is

[1] UK Civil Aviation Authority (2025) CAA Policy and Guidelines on Wind Turbines, CAP 764. Available from: https://www.caa.co.uk/publication/download/14561 [Accessed: 8th of May 2026]

[2] UK Civil Aviation Authority (2016) Air Navigation Order 2016. Available from: https://www.caa.co.uk/uk-regulations/aviation-safety/civil-aviation-act-1982-the-ano-2016-the-rules-of-the-air-2015-and-the-dg-regulations-2002/the-civil-aviation-air-navigation-order-2016/ [Accessed: 8th of May 2026]

[3] CAA letter dated 5th May 2026, included in **Technical Appendix 2.3: Aviation Assessment (EIAR Volume 4)**

[4] Landscape Institute., Institute of Environmental Management and Assessment. (2013) *Guidelines for Landscape and Visual Impact Assessment, Third Edition*. London. Routledge.

[5] Landscape Institute and the Institute of Environmental Assessment (2013) Guidelines for Landscape and Visual Impact Assessment. Third Edition. Page 103, paragraph 6.12.

[6] Scottish Natural Heritage (2017) Visual Representation of Wind Farms. Version 2.2. Available online from: . https://www.nature.scot/doc/visual-representation-wind-farms-guidance [Accessed 23rd October 2025

considered that the perceived brightness of the lights that would be observed from each viewpoint is important to understand, including an understanding of atmospheric dispersal, attenuation by distance, and angle of view relative to the focus of the light, and darkness adaptation, in order to be able to make a meaningful assessment of visual effects.

Examples of Lighting

1.1.9 The intensity of light emitted is measured in candela, but the apparent brightness of light received from low intensity lights by the human eye is measured in microlux (microlumens per m^2). These units can be difficult to use without translation into examples that may be familiar to viewers. Some examples include:

- Planet Venus: 140 microlux;
- Orion constellation, upper left and lower right stars: 1.5 -2 microlux;
- Orion constellation, 'belt' stars: 0.3 microlux;
- Faintest light visible to a 'typical' person: 0.01 microlux; and
- Car rear brake lights, although they vary, are in the order of 70-80 candela (ca), and at 1 km may appear as 100 microlux.

1.1.10 NatureScot advises that quantitative analysis is *'less useful'* for the assessment of effects on the night time experience of the lights than qualitative comparisons with existing lights that people may be familiar with. However, it is clear from the science of lighting, and as set out in this TA, that understanding the calculated light intensities and brightness of lights (quantitative) is important to be able to carry out an assessment, even in a relative (qualitative) way. It is important to note that specifications for existing lights in the landscape are not available, such that comparisons cannot be quantitative.

1.1.11 The apparent brightness of the light (received by the human eye) depends not only on how much light is emitted (intensity), but also on intervening atmospheric conditions (rain, fog, dust, haze, etc) that cause atmospheric dispersal of light; the lit environment of the viewer (standing in a well-lit area or a dark place); and the distance from the light source. The apparent brightness reduces with distance (attenuation) in clear weather as well as when there are poorer viewing conditions. Brightness reduces with the square of the distance ($x=1/distance^2$), such that a light observed from a distance of 10 km would have an apparent brightness only 1% of that of the same light observed from a distance of 1 km.

1.1.12 When lights are designed to give a horizontal beam with reduced upward and downward spill of light, the brightness of the light is decreased for viewers close to the turbines viewing them from below.

1.1.13 An important factor for perception of light is the different ways that cameras and human eyes perceive light. Cameras are governed by lenses and settings, human eyes adapt to different light environments (for example it can seem very dark when lights are first switched off, until one's eyes become accustomed to the dark). Dark adaptation of the human eye is related to the 'rods' and 'cones', light detecting cells in the back of the eye that have different roles in low light levels, with rods taking over from cones when it is dark. Cones detect colour and are used in the light (being less sensitive in low light levels), while rods are not as good with colour but can pick up faint lights (they switch off in bright light). Dark adaptation is when the rods can fully activate and can make out faint lights in a dark environment, but as soon as a light is switched on, even briefly, cones take over again, and it takes time for the rods to reactivate. Lights clearly visible to dark-adapted eyes may be imperceptible when other lights are first switched off (before dark adaptation can occur), or when in a bright place such as under street lights or from within a dark vehicle when much of the attention is on the pool of light from the headlights. In these environments dark adaptation cannot occur in full as the rods in our eyes cannot fully take over. It is noted that most people would be close to lights after dark, either in lit houses/properties, or in vehicles with headlights on. This makes the perception of other lights more difficult.

1.1.14 In contrast, cameras do not have any adaptation, but light capture depends on exposure and camera settings (modern cameras may have auto-adjust or 'night mode', but this is not adaptation in the same way as the human eye). This means that images can be very different to what we experience. An issue for photographic capture and rendition of lights is that existing lights shown in photographs can appear larger and more blurred than those seen by the naked eye in the field. The term used in photography to describe this effect is 'bokeh' which has been defined as 'the way the lens renders out of focus points of light'. This is difficult to avoid when taking photographs of lights (particularly moving lights such as vehicle headlights). To best model the lights as if they were existing, this effect has been added to the hub lights in the viewpoint illustrations.

1.1.15 It is not possible to accurately model the exact brightness of the lights, given variations in not only light specifications and camera settings, but also weather and atmospheric conditions at the time of photography, as well as the resolution and colour calibration of a computer screen, ambient light when viewing images on screen, and finally printer resolution and paper quality. However, the lights illustrated on the figures have been 'calibrated' as best possible using comparison with images of other lights in the views, and other examples of existing potentially equivalent lighting observed in South Lanarkshire, and other lights on wind farms in other parts of Scotland.

1.1.16 The duration of effects of the lights depends on when the lights are switched on and off. Sunset occurs when the sun disappears below the horizon, sunrise is the time at which the sun first appears on the horizon in the morning. The exact times of sunset and sunrise vary throughout the year. Although it is not visible, the sun still illuminates the sky with diffused light for a period of time after sunset and before sunrise, known as twilight. There are different stages of twilight:

- Civil twilight, which begins once the sun has disappeared below the horizon and continues until it descends to 6 degrees below the horizon. This translates in duration as from sunset to about half an hour after sunset, or for half an hour before sunrise. As noted in this TA, civil twilight is still bright, such that the aviation lights are unlikely to be visible against the bright sky. Aviation lights would be stitched on half an hour after sunset (and off half an hour before sunrise) because of this;
- Nautical twilight, when the sun is between 6 and 12 degrees below the horizon, which is for approximately half an hour after civil twilight in the evening, or before civil twilight in the morning (landforms are still visible while the stars start to appear and so it is a valuable time for navigators at sea). During this phase the aviation lights would be on, and would become more visible as the daylight diminishes; and
- Astronomical twilight, when the sun is between 12 and 18 degrees below the horizon. Below 18 degrees below the horizon, the sun no longer illuminates the sky.

1.1.17 It is noted that it does not necessarily get completely dark, with lingering light on short summer nights, moonlight, or the glow from settlement lights, and light reflected off clouds. In these conditions, the turbines may be partially visible over short distances at different times of night, and the apparent brightness of the lights may be affected by other lights, e.g. when seen against the late sun-lit clouds in views towards the west or seen from well-lit areas. Conversely there would be evenings and mornings that are darker due to weather conditions such as thick cloud cover.

1.2 Methodology and Approach

Assessment Methodology

1.2.1 The methodology and approach to the assessment of significance of lighting effects are based on the methodology of the LVIA, which is based on GLVIA3 as set out in **Technical Appendix 4.1 (EIAR Volume 4)**. Key aspects relevant to the visual assessment of aviation lighting include:

- Identification of baseline lighting at night, including existing lights of local properties and existing wind farms or other structures visible, as well as areas of darkness;
- Information about likely brightness of lighting seen from viewpoints;
- Description of lighting relative to the existing lights; and
- Assessment of effect on the night time view as a result of the introduced lights.

1.2.2 In considering sensitivity of receptors and magnitude of change to arrive at a judgement of significance of effects, it is noted that:

- Guidance on sensitivity is generally in relation to day-time views, and night-time sensitivity is very different. At night, viewpoints that of high value and susceptibility may be of low sensitivity at night because people do not go there to see the dark. Locations within Dark Skies Parks are an exception to this as people go to experience the dark and observe the stars, but for most places, sensitivity is low as people move through or between lit spaces (turning lights on or using headlights as necessary) and usually view darker landscapes from better lit locations. However, consideration of night-time sensitivity also needs to include how many people would be at that location to see the night-time view (many on main commuter roads in winter, to none on mountain tops) and who would see the view (residents who may go out of their homes to see the night sky, or road users who would be focussed on the road ahead lit by headlights); and
- The change to night views includes consideration of baseline lighting in the view and the proposed lights, including intensity and position in the view in relation to existing lights, as well as colour, nature (steady or flashing) and duration.

1.2.3 Changes to night-time viewing experiences are considered briefly for all viewpoints, and a review undertaken of potential night-time effects on landscape and visual receptors.

1.2.4 The likely brightness of the lights seen from landscape and visual receptors is a function of emitted light and angle of view (reduced downward light spill from a horizontal beam design), as well as distance attenuation and atmospheric conditions. The assessment below considers potential brightness of the lights in clear conditions.

Fieldwork

1.2.5 Field visits undertaken for the LVIA between September 2025 and April 2026 included observations made after dark. Fieldwork and photography specific to the night-time lighting assessment was undertaken in April 2026.

ZTV Modelling

1.2.6 ZTV mapping has been carried out to identify the theoretical visibility of the hub lights. It is noted that the ZTV uses a bare ground model and does not account for local screening by woodlands or buildings. The ZTV in **Figure 4.15 (EIAR Volume 3a)** is calculated to show visibility of all hubs to 25 km. **Figures 4.16.1 – 4.16.10 (EIAR Volume 3a)** shows the visibility of the aviation lights, calculated to hub height for the lit turbines only, and is coloured to illustrate the downward angle of view (from the light to the viewer) and therefore represents the brightness emitted at that angle. It does not include attenuation by distance, nor does it take account of variations in atmospheric conditions.

Production of Visualisations

1.2.7 Photography for night-time photomontages to illustrate potential effects of aviation lighting was carried out in the evening. A set of photographs was taken prior to sunset to ensure that the camera was correctly set up, and to allow cross reference between lights caught on dark photographs and buildings caught on day-time photographs. A series of photograph sets were taken over a period of about an hour and a half from sunset into nautical twilight. This enabled the photographer to take multiple sets as the sky darkened, with varied camera settings. Downloaded sets were then reviewed to select a set that best matched NatureScot advice on having the sky relatively dark and other lights in the landscape on, but the form of the landscape still visible.

1.2.8 Photomontages prepared for night-time views using photography taken during twilight were produced using the same method as for daylight photomontages (methodology as set out in **Technical Appendix 4.1 EIAR Volume 4)**, with turbines rendered in black as silhouettes. Images of aviation lights are provided for indicative illustration only and have been modelled on the basis of approximately 200 cd for viewpoints.

Scope of the Assessment

1.2.9 The assessment of effects of aviation lighting at night briefly considers each of the viewpoints used in the LVIA briefly, with additional information and illustrative dark photomontages for four viewpoints:

- Viewpoint 5: Upper Wanlockhead;
- Viewpoint 6: B797 Road;
- Viewpoint 14: B7040/A702 junction at Elvanfoot; and
- Viewpoint 17: Leadhills Football Pitch.

1.2.10 Settlements are places where people are most likely to be at night but are also where there is abundant lighting. From well-lit areas, faint lights are more difficult to see. With lights nearby, although the lights of the Proposed Development may be visible from settlements, there would be no likelihood of significant effects. For the purposes of this assessment, views from the two nearest settlements, Leadhills and Wanlockhead are considered. Roads are of lower susceptibility as people's views when travelling along roads would be influenced by their own vehicle internal and external lights and those of vehicles travelling in the same direction or opposite and have therefore not been considered in the assessment.

1.2.11 During the times when the lights would be on, the perception of the character of the landscape is reduced to nothing in darkness, such that whilst the lighting may be seen in views when the outlines of landforms and horizons would still be visible, the likelihood of significant effects on the perception of landscape character decreases rapidly with the onset of darkness.

1.3 Baseline Lighting

1.3.1 There is no source of artificial lighting within the Site due to it being an upland area of moorland.

1.3.2 Within the wider landscape there are several light sources including the light glow from larger settlements although it is difficult to see the source of the lighting due to screening by the surrounding Southern Uplands. This is also the case for the M74 Motorway and A74 (M) road which includes a light glow along its corridor during hours of darkness from vehicles heading north and south, and where visible, include the sources of light being omitted. This also includes smaller roads such as the A702, B797 and B7040 roads which are regularly crossed by traffic but comprise lower numbers of vehicles.

1.3.3 In upland areas, the skies are relatively dark with sources of artificial light coming from scattered properties in lower lying areas, transmitter and radar stations such as Green Lowther, and masts to the north at Shotts and along the Solway to the south.

1.3.4 Lit wind farms are mainly found to the north and west of the Site where larger turbines of over 150 m have been constructed or as a result of proximity to flight paths.

1.3.5 No ready comparison can be made between the lights that would be installed at the Proposed Development and the lights noted above because their technical specifications are not known. The perceived brightness of a light at any given distance depends fundamentally on this specification. Additionally, the specifications of lights of the type required for wind farms are developing in response to the issues which may arise for visual amenity and may be different by the time any permission is implemented.

1.4 Assessment of Visual Effects of Aviation Lighting

1.4.1 As stated above, it is assumed that ten of the proposed turbines would be lit (Turbines 1, 3, 5, 6, 8, 9, 11, 16, 20, and 21) with medium intensity 2000/200 cd steady red lights on the nacelle (a second light on each nacelle would be installed as backup but would not be lit when the primary light is functional). The lights would come on half an hour after sunset and would be switched off half an hour before sunrise (to be on during nautical twilight).

1.4.2 Mitigation includes the reduction of intensity of the lights during conditions of clearer visibility, such that the lights would only operate at full intensity of 2000 cd when visibility is less than 5 km. At other times they would be at 10%, i.e. 200 cd. Met Office meteorological data for the local area suggests that the lights would be at 2000 cd for 7-10% of the time and at 200 cd for 90-93% of the time.

1.4.3 Candidate lights are designed to give a horizontal beam with reduced upward and downward spill of light, such that the brightness of the light is decreased for viewers close to the turbines viewing them from below. Below -4° the lights should not be visible, although from nearby locations the reflection of light on the passing blades would be visible. Angles discussed below and shown on **Figures 4.16.1 – 4.16.10 (EIAR Volume 3a)** are angles emitted from the bulb.

Analysis of ZTV

1.4.4 The combined aviation lighting ZTV on **Figure 4.15 (EIAR Volume 3a)** was modelled for the reduced lighting schedule. The ZTV is calculated to show the minimum vertical viewing angle for the lights visible at each point, i.e. the angle closest to the horizontal for the brightest light - which is not necessarily the closest turbine or the same turbine at each point. Whilst the ZTV does not indicate which turbine would be the brightest, it indicates the least amount of downward reduction in intensity. The ZTV illustrates that there would be greater downward angles of view when closer to the proposed turbines, and lesser downward angles when seen from higher ground to the north, east, south and west. It should be noted that the ZTV in **Figures 4.16.1 – 4.16.10, (EIAR Volume 3a**) does not illustrate the brightness of light that may be received in any one place, which needs to take account of distance attenuation, weather conditions and the technical specifications for a candidate light unit. Calculations for apparent brightness have been provided for the four viewpoint locations considered.

Assessment of Visibility of Lights from Viewpoints

1.4.5 Table 4.6.1 below sets out which lights would be seen from each viewpoint.

Table 4.6.1: Aviation Lights from Viewpoint Locations

Viewpoint	Turbines									
	1	3	5	6	8	9	11	16	20	21
1. Tinto	X	X	X	X	X	X	X	X	X	X
2.Crawfordjohn	X	X	X	X						
3. Hart Fell	X	X	X	X	X	X	X	X	X	X
4. Hods Hill, Southern Upland Way						X	X	X	X	
5. Upper Wanlockhead										
6. B797 Road			X			X			X	
7. Cairn Table	X	X	X	X	X	X	X	X	X	x
8. Abington						X	X		X	
9. B797 South of Leadhills near Glengonnar Station			X			X	X	X	X	x
10. B7040 Shortcleugh								X		
11. B7040 east of the Hass						X	X	X		X
12. Southern Upland Way, Whing Head	x		X	X	X	X			X	
13. Green Lowther	X	X	X	X	X	X	X	X	X	x
14.B7040/A702 junction at Elvanfoot							X		X	x
15. Core Path SL135					X					
16. Scottish Hill Track 58	X	X		X						
17. Leadhills Football Pitch	X		X							
18. Glengaber Hill, SUW	X	X	X	X	X	X			X	X

1.5 Assessment of Visibility of Lights from Settlements

1.5.1 All settlements are judged to be of **High** sensitivity as people at their home attach a **High** value to their existing levels of light at night-time and are more susceptible to being affected by changes, resulting in a **High** susceptibility.

ELVANFOOT

1.5.2 From the main settlement, no aviation lights would be visible at night-time due to screening by intervening landform. However, from the northwestern edge of the settlement close to the road junction with the B7040 road, aviation lighting on T11 , T20 and T21 would be seen from one property as shown on **Figure 4.32.5, (EIAR Volume 3b)**. This would be seen in the context of lights associated with the A74 (M) road further to the east, lights at the nearby telecommunication mast and from the occasional vehicle travelling on the B7040 road.

1.5.3 Therefore, a **Low** magnitude of change is predicted, resulting in a **not significant (Minor)** effect to one property, and a **Negligible** magnitude of change and effect for the majority of the settlement.

LEADHILLS

1.5.4 At night, the aviation lights on T1, and T5, would be seen from Leadhills which would have strong downward angles (steeper than -3° to -4°) that reduce their brightness. **Viewpoint 17: Leadhills Football Pitch, Figures 4.35.7** and **4.35.10, (EIAR Volume 3b)** represents the night-time view from the property. This would introduce a new element of artificial lighting seen from the village in the context of lights from houses, streetlights and vehicle lights within the village. It is not considered that this would result in a significant effect as people's views are already affected by artificial lighting. Therefore, a **Low** magnitude of change is predicted, resulting in a **not significant (Minor)** effect.

WANLOCKHEAD

1.5.5 Wanlockhead is not predicted to receive views of the aviation lighting due to intervening screening by landform. **Viewpoint 5: Upper Wanlockhead, Figure 4.23.7, (EIAR Volume 3b)** shows views from the eastern side of the village. From here, properties are elevated on a slope leading to Lowther Hill and the aviation lights would not be visible. Therefore, a **Negligible** magnitude of change is predicted, resulting in a **not significant (Negligible)** effect.

1.6 Assessment of Visibility of Lights from Footpaths and Hills

1.6.1 Observations relative to footpaths and routes are set out below. It is noted that users of footpaths and hills have **High** night-time sensitivity and have dark-adapted vision. People are likely to be focused on the surrounding landscape or on features within the landscape and are assessed as the worst-case scenario, i.e., with no torch or headlight.

1.6.2 The ZTV shown on **Figure 4.15 (EIAR Volume 3a)** shows that the theoretical visibility of aviation lights would be relatively well contained within 5 km. Thereafter, the aviation lights would be viewed to the north to approximately 10 km, fairly widespread up to 25 km to the northwest. Due to landform, visibility would reduce to sporadic areas comprising upper slopes and summits extending from the northeast around to the southeast, and uplands to the west to approximately 15 km. Thereafter, visibility of aviation lights would be very limited to a few summits.

1.6.3 Within 5 km, the aviation lights would predominantly be viewed from lower elevations to the Site at angles of -3 to -4 degrees which would reduce the intensity of the lights, gradually rising around the periphery of 5 km to 0 to -3 degrees owing to the increase in elevation. Due to the proximity of receptors to the proposed turbines, people are likely to experience a reflection of light along the blades when it rotates and passes the top of the hub where aviation is fixed. Likely visible receptors to be affected include:

- SUW;
- SHT: 56: Coulter to Crawford 58: Douglas to Wanlockhead, 59: Muirkirk to Wanlockhead, 61/61a: Wanlockhead to Sanquhar, 62: Wanlockhead to Enterkinfoot by the Enterkin Pass;
- Core Paths within 5 km;
- Hills to the north, northeast to southeast, south and west; and
- Residential properties within 2.5 km.

1.6.4 From footpaths, the lights within 5 km the aviation lights would be viewed at lower levels and introduce lighting into all areas around Leadhills. This would be viewed in the context of scattered properties and sporadic vehicles using the A702, B797 and B7040 roads. The aviation lights would extend the effects of the Proposed Development into the hours of darkness and would often be viewed along with the silhouette of the proposed turbines.

1.6.5 Beyond the lower lying areas, the aviation lights would be viewed from the surrounding uplands to the northeast, and east, situated in part of the south, southwest and west. From here, the aviation lights would form more distant features and seen at higher levels of elevation resulting in 0 to -1, and in a few cases -1 to -2 degrees. At these elevations, the intensity of the aviation lights would be higher but owing to the distance areas predicted to experience views would be reduced.

1.6.6 Distance from the aviation lights would also result in a slight flickering of the lights in views due to atmospheric pressure.

1.6.7 Therefore, magnitude of change is predicted to be **Low** for the receptors mentioned below resulting in a **significant (Moderate)** effect during the hours of darkness:

- SUW;
- SHT 56: Coulter to Crawford 58: Douglas to Wanlockhead, 59: Muirkirk to Wanlockhead, 61/61a: Wanlockhead to Sanquhar, 62: Wanlockhead to Enterkinfoot by the Enterkin Pass;
- Core Paths within 5 km;
- Hills to the north, northeast to southeast, south and west; and
- Residential properties within 2.5 km.

1.6.8 The potential effect on receptors would be an extension of the overall effects into hours of darkness affecting a small number of people.

1.6.9 The remaining receptors within the 25 km Study Area are not judged to receive significant effects owing to distance from the Proposed Development, screening by landform and forestry, and presence of other artificial light sources in the Study Area which reduce the sensitivity of night-time skies for darkness.

References

NatureScot (2024) Guidance on Aviation Lighting Impact Assessment. Available online from: https://www.nature.scot/doc/guidance-aviation-lighting-impact-assessment [Accessed: 7th April 2026]