

Tangy IV Wind Farm Section 36C Variation

Technical Appendix 5.10: Landscape and Visual Assessment of Aviation Lighting

TECHNICAL APPENDIX 5.10: Landscape and Visual Assessment of Aviation Lighting

1.	Introduction	1
1.2	Description of Proposed Lighting	1
2.	Proposed Mitigation	1
2.2	Cardinal Lighting Strategy	2
2.3	Reduced Lighting Intensity at Different Vertical Angles	2
2.4	Reduced Intensity Based on Meteorological Visibility	3
3.	Approach and Methodology	3
3.2	Establishing the Baseline	3
3.3	Appreciation of the Proposed Varied Development	4
3.4	Analysis of Receptors and Residual Effects	4
3.5	Assessment of Significant Effects	6
3.6	Limitations of the Assessment	8
4.	Assessment of Effects	8
4.1	Existing Lighting Baseline	8
4.2	Potential Effects	8
4.3	Zone of Theoretical Visibility	9
4.4	Visible Aviation Lighting Effects on Landscape Character Types and Designated and Protected Areas	10
4.5	Visible Aviation Lighting Effects on Visual Receptors	19
5.	Conclusion	37

Technical Appendix 5.10: Landscape and Visual Assessment of Aviation Lighting

1. Introduction

1.1.1 ASH design + assessment Ltd (ASH) has undertaken an assessment of the landscape and visual effects of the aviation lighting proposals for the Proposed Varied Development. This assessment is supported by a series of Zone of Theoretical Visibility (ZTV) Figures illustrating the theoretical extent of visible aviation lighting (see **Volume 4, Technical Appendix 5.10, Figures TA5.10-1 to 5.10-5**). Daytime visualisations have been prepared from all viewpoints included in the assessment of the Proposed Varied Development. Each of the accompanying wirelines indicate which turbines would be lit. Photomontages have been prepared from three agreed LVIA viewpoints to illustrate the effects of the proposed lighting strategy (see **Volume 4, Technical Appendix 5.1 and Volume 3b, Figures V3b – 2.6, V3b – 5.6 and V3b – 15.6**).

1.2 Description of Proposed Lighting

1.2.1 This assessment is based on the lighting scheme proposed in **Chapter 15: Aviation, Technical Appendix 15.1: Tangy IV Wind Farm Aviation Lighting Assessment Report**, and on the requirements of the CAA Policy Statement: *Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level*¹ (the CAA policy statement).

1.2.2 In line with the approved CAA lighting scheme and policy statement, the assessment is therefore based on the following assumptions:

- Four of the cardinal turbines (T1, T6, T8 and T11) would have an infrared light and a 2,000 candela (cd) red light fitted to the top of the nacelle (assumed to be at 125 m), visible in all directions. The fifth cardinal turbine, T5, would have a 200cd red light fitted to the top of the nacelle, visible in all directions;
- A second 2,000cd light would be fitted to the nacelles of four of the cardinal turbines (T1, T6, T8 and T11) to act as a back-up to be used in the event of failure of the main light. A second 200cd light would be fitted to T5;
- Visibility sensors will be employed to dim medium-intensity lights from 2,000cd to 200cd when visibility is 5km (or greater), in line with CAA policy and NatureScot's preference.
- All lights would be steady (i.e. not flashing). However, depending on wind direction, moving turbine blades seen in front of lights may give an impression of flashing lights from some locations.

2. Proposed Mitigation

2.1.1 Due to the height of Proposed Varied Development (up to 200m to tip), aviation lighting would be required in line with the Air Navigation Order¹. Discussions between the Applicant and the CAA on a reduced aviation lighting scheme have been agreed. As such

¹ The Air Navigation Order 2016, S.I. 2016 No.765, Article 222.

the lighting scheme outlined in **Appendix 15.2 Civil Aviation Authority (CAA) Response to Tangy IV Wind Farm Aviation Lighting Assessment Report** has been used as the basis for this assessment.

2.2 Cardinal Lighting Strategy

2.2.1 In order to limit the potential aviation lights visible from receptors, the proposed lighting scheme consists of a 2,000cd steady red light on the nacelles of 4 of the 16 turbines (T1, T6, T8 and T11) and a 200cd steady red light on the nacelle of T5, together with infra-red lighting, not visible to the unaided human eye on the nacelles of all turbines.

2.3 Reduced Lighting Intensity at Different Vertical Angles

2.3.1 Light ‘spill’ caused by aviation lighting would be minimised, by adjusting the narrow vertical beam spreads using shields or optical adjustments. This ensures visibility to pilots at or above nacelle level while significantly reducing downward spill. This would maintain compliance with the CAA and ICAO’s omnidirectional horizontal visibility requirements without excessive illumination^{2, 3}.

Table 1: Example Potential Reductions in Light Intensity at Different Vertical Angles⁴

Vertical Angle	Turbine Lighting Intensity 2000cd light	Turbine Lighting Intensity 200cd light
0 degrees to 3 degrees	2200/2500cd	220/250cd
0 degrees to -1 degrees	2200 to 980cd	220 to 98cd
-1 degrees to -2 degrees	980 to 420cd	98 to 42cd
-2 degrees to -3 degrees	420 to 220cd	42 to 22cd
-3 degrees to -4 degrees	220 to 170cd	22 to 17cd
Below -4 degrees	Below 170cd	Below 17cd

2.3.2 The implication of this is that lighting intensity will vary depending on the angle of receptors relative to the aviation lighting. This can represent a considerable reduction in the perceived brightness of the aviation lighting from receptors at lower levels. **Figure TA 5.10-2: Visible Aviation Lighting Theoretical Intensity ZTV** illustrates the ZTV for the

² ICAO Annex 14 Chapter 6 Visual Aids for Denoting Obstacles
³ CAA Policy Statement – Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level
⁴ NatureScot (2024). Guidance on Aviation Lighting Impact Assessment. Available at: Guidance on Aviation Lighting Impact Assessment | NatureScot. Accessed August 2025.

proposed aviation lighting strategy taking account of the angles at which the lights would be seen.

- 2.3.3 The design of the lights can also be used to minimise the lighting spill onto the turbine nacelles, towers and blades.

2.4 Reduced Intensity Based on Meteorological Visibility

- 2.4.1 The visible lights on the on the cardinal turbines will be dimmed to 10% of their nominal intensity when the measured meteorological visibility exceeds 5km. When meteorological visibility is less than 5km, the perceived brightness of the full intensity lights (2,000cd) would be reduced by the conditions requiring their use. The lights will be regularly obscured by cloud and when not obscured would be set at the lower 200cd for up to 98% of the time. This means that receptors located over 5km from the Proposed Varied Development are unlikely to experience the aviation lighting at full intensity.

3. Approach and Methodology

- 3.1.1 The cardinal aviation lighting assessment has been prepared with reference to Guidelines for Landscape and Visual Assessment (Third Edition) (GLVIA3)⁵ and taking account of the guidelines provided by NatureScot^{6,7}.
- 3.1.2 GLVIA3 places a strong emphasis on the importance of professional judgement in identifying and defining the significance of landscape and visual effects. As part of this assessment, professional judgement has been used in combination with structured methods and criteria to evaluate value, sensitivity, and magnitude and significance of effect. The assessment has been undertaken and by Landscape Architects at ASH design + assessment.
- 3.1.3 Methods promoted by GLVIA3 require an appreciation of the existing environment and the ability of its key components to accept the change proposed. An understanding of the potential effects which could occur and how these could affect the key components and the potential to mitigate adverse effects. The NatureScot Guidance emphasises the importance of appreciating the different sensitivities landscape and visual receptors have at night and the potential effects that aviation lighting specifically might have. There are four key stages to the assessment which are presented in the following sub-sections.

3.2 Establishing the Baseline

- 3.2.1 A 20km Study Area was selected, being the area within which it is considered that significant effects from the cardinal aviation lighting could potentially be experienced. This area is consistent with the Detailed Study Area for the main LVIA of the Proposed Varied Development

⁵ Landscape Institute (LI) / Institute of Environmental Management and Assessment (IEMA), (2013), *Guidelines for Landscape and Visual Impact Assessment, Third Edition*. Routledge.

⁶ Scottish Natural Heritage, (2017), *Visual Representation of Wind Farms (Version 2.2)*.

⁷ NatureScot (2024). *Guidance on Aviation Lighting Impact Assessment*. Available at: [Guidance on Aviation Lighting Impact Assessment](#) | NatureScot. Accessed May 2026.

3.3 Appreciation of the Proposed Varied Development

- 3.3.1 An appreciation of the proposals has been developed through building an understanding of the proposed cardinal aviation lighting requirements and the surveyors experience of existing wind turbine sites with aviation lights of a similar intensity during the hours of darkness.

3.4 Analysis of Receptors and Residual Effects

- 3.4.1 Establishing the baseline is followed by the systematic identification of likely effects on the receptors. This is a two-fold process, giving consideration to how effects could arise from a cardinal aviation lighting strategy for the Proposed Varied Development, and how these changes could be accommodated in the existing baseline.

Landscape and Visual Sensitivity

- 3.4.2 Sensitivity concerns the nature of the baseline landscape or visual receptor, and the ability to accommodate development of the type proposed without compromising the key characteristics and / or composition.
- 3.4.3 There are two aspects which contribute to the evaluation of landscape and visual sensitivity: value and susceptibility to change. The consideration of these two separate aspects in the differing assessments for landscape and visual amenity are outlined below.
- 3.4.4 Landscape sensitivity is reflective of the nature of the landscape and its ability to accommodate development of the type proposed without compromising its key characteristics and components. This involves the consideration of the baseline value of the landscape and its susceptibility to change. When considering value and susceptibility in the context of aviation lighting, the degree to which the character of the area is currently characterised by artificial lighting or a lack of it, is particularly important. It should be noted that some characteristics that contribute to the daytime value of a landscape may not be as relevant at night and vice versa.
- 3.4.5 Visual sensitivity considers the nature and viewing expectation of the receptor and takes into account the perceived value of the existing view and the susceptibility of the visual receptor to change. The importance of the aspect of the view which would be changed contributes to the sensitivity evaluation. The sensitivity evaluation considers the value of views during low light conditions when aviation lights could be on, as well as during full darkness.
- 3.4.6 The value and susceptibility of receptors can differ at night. Features that are valued during the day may not be visible at night while other features such as the starry night sky may best be appreciated during the hours of darkness. Likewise, individuals seeking out activities that require darkness (i.e. stargazing) will have a higher level of susceptibility than others whose activities take place irrespective of the light levels (i.e. outdoor sporting clubs that gather under flood lights in the evening or commuters focussed on the road).
- 3.4.7 Criteria for the evaluation of sensitivity to change are presented below in **Table 2**. These levels represent points on a continuum and, where required, interim ratings such as Low-Medium have been used to indicate the anticipated level.

Table 2: Landscape and Visual Sensitivity Criteria

Sensitivity Rating	Landscape Sensitivity	Visual Sensitivity
High	A landscape which is specifically recognised and valued and for its dark skies and has a notable susceptibility to new sources of light.	Visual receptors occupying buildings, recreational routes or promoted locations where an appreciation of dark skies is a particularly noted and valued aspect of the view and there are no other lights or distracting features leading to a notable susceptibility to new sources of light.
Medium	A landscape which is valued for some dark sky conditions but is influenced by some existing peripheral or localised sources of light and is tolerant of some degree of change.	- Visual receptors occupying buildings, recreational routes or other locations which are valued for their dark skies and/or there are localised or peripheral sources of lighting within the baseline and are tolerant of some new light sources; or - Visual receptors occupying buildings, travelling on public roads or other transport routes, or at other locations where dark skies are present, but the activity of the receptor is less focussed on an appreciation of the dark sky conditions and which are capable of accommodating some degree of change.
Low	A landscape which is less noted for dark sky conditions and/or is affected by existing baseline lighting leading to a limited susceptibility to new sources of light.	- Visual receptors occupying buildings, routes and other locations where existing lighting is prominent and/or distracting in the baseline leading to it being less valued for dark sky conditions and less susceptible to new sources of light; or - Visual receptors occupying buildings, travelling on public roads or other transport routes or at other locations where dark skies are affected by localised or peripheral sources of lighting within the baseline, but the activity of the receptor is less focussed on an appreciation of the dark sky conditions leading to a limited susceptibility to new sources of light.

Magnitude of Change on Landscape and Visual Receptors

3.4.8 Magnitude of change concerns the extent to which the existing landscape character or view would be altered by the Proposed Development. Elements specific to the evaluation of magnitude of change for the differing assessments of landscape and visual amenity are detailed below:

- Landscape
 - The degree to which features or characteristics may be removed, altered or added within the landscape;
 - The geographical extent of proposed changes;
 - Whether changes would be direct or indirect; and

- The potential duration and reversibility of proposed changes (taking into consideration proposed mitigation measures where relevant).
- Visual Amenity
 - The scale or extent of proposed changes within the view;
 - The location of proposed changes within the view, relative to other existing features;
 - The extent to which this may alter the composition or focus of the view; and
 - The duration and reversibility of proposed changes (taking into consideration proposed mitigation measures where relevant).

3.4.9 Criteria for the evaluation of magnitude of change are presented below in **Table 3**. These levels represent points on a continuum and, where required, interim ratings such as Low-Medium have been used to indicate the anticipated level.

Table 3: Landscape and Visual Magnitude of Change Criteria

Magnitude Rating	Landscape	Visual
High	A notable change in landscape characteristics over an extensive area ranging to a very intensive change over a more limited area.	Where the Proposed Development would result in a very noticeable change in an existing static view. Where the Proposed Development would lead to frequent, very noticeable or noticeable change to a sequential view.
Medium	A perceptible change in landscape characteristics over an extensive area ranging to a notable change in a localised area.	Where the Proposed Development would result in a noticeable change in an existing static view. Where the Proposed Development would lead to occasional very noticeable change ranging to frequent less noticeable change in a sequential view.
Low	A virtually imperceptible change in landscape characteristics over an extensive area or a perceptible change in a localised area.	Where the Proposed Development would result in a perceptible change in an existing static view. Where the Proposed Development would result in briefly obtained noticeable change ranging to more frequent perceptible change in a sequential view.
Negligible	No discernible change in any landscape characteristics or components.	Where the Proposed Development would result in a barely perceptible change in an existing static or sequential view.

3.5 Assessment of Significant Effects

3.5.1 The purpose of this assessment in the context of the Proposed Varied Development is to identify predicted significant effects on the landscape and visual amenity arising from the

proposed cardinal aviation lighting strategy. For the purposes of the assessment effects identified as being **Moderate** or above may be regarded as significant.

3.5.2 The significance of effect for landscape and visual elements is considered as follows:

- The assessment takes into account identified effects upon existing landscape receptors resulting from the introduction of cardinal aviation lights on the Proposed Varied Development and assesses the extent to which these would be lost or modified, in the context of their importance in determining the existing baseline character.
- The assessment takes into account likely changes resulting from the introduction of cardinal aviation lights on the Proposed Varied Development to the visual composition, including the extent to which new features would distract or existing elements in the view or disrupt the scale, structure or focus of the existing view.⁸

3.5.3 Criteria used for the assessment of effects are presented below in **Table 4**. These levels represent points on a continuum and, where required, interim ratings such as Low-Medium have been used to indicate the anticipated level

Table 4: Landscape and Visual Significance of Effect Criteria

Effects Significance	Landscape Effects	Visual Effects
Major Adverse (significant)	The Proposed Varied Development would comprise a clearly noticeable and detracting new light source within a particularly sensitive landscape, leading to substantial deterioration of dark sky characteristics.	The Proposed Varied Development would create a prominent and very detracting source of light within an existing highly sensitive view of a dark sky and would result in a very noticeable deterioration to visual amenity.
Moderate Adverse (significant)	The Proposed Varied Development would form a noticeable new source of light within a landscape of generally dark skies, or a more detracting source of light within a landscape where some existing lights are present, leading to an appreciable reduction in the dark sky characteristics of the landscape	The Proposed Varied Development would introduce a fairly prominent and somewhat detracting new light source within an highly sensitive view which is appreciated for its darkness, or would be more prominent within a somewhat sensitive but generally dark view resulting in a noticeable deterioration to visual amenity.
Minor Adverse (Not Significant)	The Proposed Varied Development would form a perceptible new source of light within the landscape	The Proposed Varied Development would form a perceptible new light source but would not detract from

⁸ The prominence of the cardinal aviation lights in the view will vary according to the prevailing weather conditions. The assessment has been carried out, as is best practice, by assuming the 'worst case' scenario. This is assumed to be in clear conditions in full darkness, unless the value of the view or effect would be greater in different lighting conditions. However, it is recognised that predicted effects could be reduced in some conditions (i.e. in the case of low cloud or haze).

Effects Significance	Landscape Effects	Visual Effects
	but would not lead to a noticeable deterioration of dark sky characteristics.	the dark qualities of the view, or would be a more prominent feature within a setting where existing light sources are already present within view resulting in a small deterioration to visual amenity.
Negligible (Not Significant)	The Proposed Varied Development would add an additional source of light to the landscape but would be well accommodated within the setting of baseline lighting and would not lead to a deterioration of the dark sky characteristics.	The Proposed Varied Development would form a barely perceptible feature within the existing view and would not reduce the appreciation of dark skies within the view or result in a discernible deterioration to visual amenity.

3.6 Limitations of the Assessment

- 3.6.1 The use and limitations of ZTV diagrams are explained in **Technical Appendix 5.1: Assessment and Technical Methodologies**. The appearance and brightness of the cardinal aviation lights has been estimated by the assessors, based on experience of similar intensity aviation lighting visited and observed during the hours of darkness.

4. Assessment of Effects

4.1 Existing Lighting Baseline

The site survey indicated that artificial light within the 20km Study Area was concentrated within the low-lying landscapes around Aros Moss and along the coastline of Kintyre, where settlement is concentrated. The settlements of Campbeltown, Machrihanish, Drumlemble, Stewarton, Kilchenzie, Glenbarr, Carradale and Peninver are the most notable sources of artificial light, and there are also scattered lights at individual properties and farms. There is also a concentration of light around Campbeltown Airport and nearby large agricultural buildings. The central uplands are less developed, with generally lower levels of artificial light, although aviation lighting is present within some wind farms in this area including Beinn an Tuirc (Phase 3) and Blary Hill. The Operational Development currently features aviation lighting on one of the turbines. Streetlights are found along some sections of the major transport routes, including the A83, B843 and B842 for sections which pass through settlements. Car headlights and break lights as well as reflections of these on other road markers result in randomised bright illuminations in the landscape.

4.2 Potential Effects

- 4.2.1 Potential effects relate to the appearance of the proposed 2,000cd nacelle lights on the four cardinal turbines and 200cd lights on one additional cardinal turbine. The effect of lighting on the receptor could be influenced by both the number and the intensity of the lights potentially visible and the extent to which baseline lighting is present. The following issues have been considered in the assessment of predicted effects:

- Aviation lights are typically focussed on a horizontal plane with intensity of light reducing below a specified viewing angle. Therefore, a lesser effect may be experienced by a viewer situated at increased angles below the horizontal (see **Figure TA5.10-2: Visible Aviation Lighting Theoretical Intensity ZTV**). However, potential intensity at different viewing angles differs between lighting manufacturers.
- Perceived intensity of the aviation lights would diminish with distance. However, in some instances, combinations of greater numbers of aviation lights seen from further away could counter this effect to some extent.
- The CAA Policy Statement allows for the lights to be reduced to 10% of their nominal value during periods where the measured meteorological visibility exceeds 5km (i.e. 200cd). This means that the cardinal aviation lights will emit a maximum intensity of 200cd most of the time; and when the higher light intensity lights are triggered by poor visibility, the lights will appear less bright to observers due to the atmospheric conditions.
- Nacelle aviation lights could lead to illumination of turbine blades as they pass through the horizontal plane of the beam and therefore in some situations the viewer would be able to perceive the movement of the turbines during the hours of darkness; and
- In certain wind directions and viewing angles, moving turbine blades in front of the aviation light would cause a flashing effect. Where a number of different turbines were aligned, this effect could be increased to a flickering impression.

4.3 Zone of Theoretical Visibility

- 4.3.1 A hub height ZTV (125m above existing ground level), was generated to illustrate areas where views of the cardinal aviation lights would theoretically be obtained (**Figure TA5.10-1a: Visible Aviation Lighting Hub Height ZTV A3**). Detailed technical information on the methods for production of ZTVs is included in the **Technical Appendix 5.1: Assessment and Technical Methodologies**.

Intensity of Visible Aviation Lighting

- 4.3.2 **Figure TA5.10-2: Visible Aviation Lighting Theoretical Intensity ZTV** illustrates the theoretical intensity ZTV for the cardinal aviation lighting scheme. It shows that the greatest levels of theoretical intensity would generally be experienced on elevated hill tops and slopes ranging from approximately 5 to 30 km from the Site. Closer areas with greater levels of theoretical intensity include:
- Cnoc Buidhe (approximately 1km to the north);
 - Summits north of Gleann nam Feannag (approximately 4km to the north); and
 - Easach Hill and Sgreadan Hill (approximately 3-5km to the east).
- 4.3.3 As many of the areas which would theoretically experience greater levels of lighting intensity are over 5km from the Proposed Varied Development, they would only experience the lighting at reduced intensities. While perceptible, at distances of over 10km the aviation lights would generally appear as distant points within the wider view. It should be noted that as these are also elevated areas it is likely that the aviation lights would be seen in the context of aviation lighting on other operational wind farms including Beinn an Tuirc (Phase 3) and Blary Hill, and potentially other cumulative

developments (if constructed), such Clachaig Glen (consented) and Cnoc Buidhe (application).

- 4.3.4 Potential visual receptors at lower elevations, that have theoretical visibility of the aviation lighting, would likely experience the aviation lights at lower intensities due to the viewing angle. However, they would introduce new sources of artificial lighting in the upland landscape.

4.4 Visible Aviation Lighting Effects on Landscape Character Types and Designated and Protected Areas

- 4.4.1 The landscape character types and designated and protected areas within the Study Area are illustrated on **Figure TA5.10-3: Visible Aviation Lighting Landscape Character Types with Theoretical Intensity ZTV** and **Figure TA5.10-4: Visible Aviation Lighting Designated and Protected Landscapes with Theoretical Intensity ZTV**. The landscape receptors most likely to experience significant effects as a result of the introduction of aviation lighting are those directly affected by the development's location within them and those in close proximity where the aviation lighting would represent a notable change to the surrounding landscape.

- 4.4.2 The following landscape receptors within the Study Area were identified as having the potential to experience effects as a result of the cardinal aviation lighting:

- LCT 39: Plateau Moor and Forest (previously Upland Forest-Moor Mosaic in 1996 Landscape Assessment of Argyll and the Firth of Clyde);
- LCT 47: Bay Farmland;
- LCT 53: Rocky Coastland – Argyll (previously Rocky Mosaic in 1996 Landscape Assessment of Argyll and the Firth of Clyde);
- Inland Glen (LCT 53);
- LCT 54: Low Coastal Hills;
- LCT 55: Coastal Parallel Ridges;
- LCT 58: Sand Dunes and Machair;
- North Arran NSA;
- WLA 03: North Arran;
- Mull of Kintyre LLA; and
- West Kintyre Coast LLA.

- 4.4.3 While the upland landscapes are generally characterised by their lack of artificial light, the more settled parts of these landscapes, located primarily within LCT 47: Bay Farmland, LCT 53: Rocky Coastland – Argyll and LCT 58: Sand Dunes and Machair feature areas with higher levels of artificial light. These are focused around the settlements of Campbeltown, Machrihanish, Drumlemble, Glenbarr and Kilchenzie, around Campbeltown Airport, and at scattered farmsteads and properties along the roads that pass through these landscapes at lower elevations. Passing vehicle headlights would also add to the baseline of artificial lights. Lights from more settled landscapes would be visible in the distance from more elevated areas.

- 4.4.4 Theoretical visibility from other landscape receptors within the Study Area is either very limited and / or located at a distance at which significant effects on landscape character

and designated and protected landscapes would be unlikely and as such these are scoped out.

Effects Likely to be Significant

- 4.4.5 Significant effects were identified for three landscape character types. The cardinal aviation lighting on the Proposed Varied Development, would directly affect a localised part of the landscape character area within which it is located.

Landscape Character Types

LCT 39: Plateau Moor and Forest (previously Upland Forest-Moor Mosaic in 1996 Landscape Assessment of Argyll and the Firth of Clyde)

- 4.4.6 The character of this LCT during hours of darkness is not specifically discussed within the NatureScot landscape character assessment. However, the overall lack of artificial light contributes to the key characteristics of “Remote upland character, despite close proximity to settled fringes and transport”. This is a relatively sparsely inhabited upland landscape, where settlement is generally limited to sheltered glens and near the outskirts of the LCT, particularly within the southern fringes of Sub-Area A, and within Barr Glen to the west. Therefore, artificial light is limited to scattered properties and passing vehicles near the edges of or right outside of this LCT, usually at lower elevations, which may be visible from some areas within this LCT. Existing wind farms, including the Operational Development, which the Proposed Varied Development would be replacing, are located within this LCT, and some of these, including Auchadaduie, Beinn an Tuirc (Phase 3) and Blary Hill wind farms, feature visible aviation lights, which contribute to the baseline of artificial lighting within this LCT. This LCT is considered to have a medium sensitivity to the proposed turbine lights.
- 4.4.7 The aviation lights would directly affect this LCT, adding artificial lights on the plateau within Sub-Area A, which would be perceived within the immediate context of the Site and its surroundings, and from elevated areas within this sub-area of the LCT as well as from facing slopes within Sub-Area B. This includes the summit of Cnoc Buidhe immediately to the north of the Site, and the summits of Sgreadan Hill and Meall Buidhe to the east / north-east, which would experience the lighting at a higher intensity, although this is likely to be screened by intervening forest, from Cnoc Buidhe in particular. This would be experienced in the context of existing visible aviation lighting on nearby wind developments resulting in a perceptible change within the wider landscape ranging to a notable change within a localised part of the southern sub-area, within approximately 5km of the Site.
- 4.4.8 From Sub-Area B, the lights would be experienced on the northern skyline within views from summits and north-facing slopes across Aros Moss, within the context of existing visible aviation lighting on nearby wind energy developments and of the more settled landscapes of Aros Moss, where some baseline lighting is present, associated with settlements, agricultural buildings and Campbeltown Airport.
- 4.4.9 Within Sub-Area A, this is reflective of a localised medium magnitude of change reducing to low overall. It was assessed that this would result in a localised **moderate** (significant) effect and a **minor** (not significant) overall effect, relating to the potential for the visible aviation lights to influence the remote upland character within this LCT. Within Sub-Area B, the introduction of the aviation lights in the northern landscape context would result in a low magnitude of change and a **minor** (not significant) change.

LCT 53: Rocky Coastland – Argyll (previously Rocky Mosaic in 1996 Landscape Assessment of Argyll and the Firth of Clyde)

- 4.4.10 The character of this LCT during hours of darkness is not specifically discussed within the NatureScot landscape character assessment. Sub-Areas B and C are both well-settled landscapes, with the settlements of Campbeltown and Machrihanish both having concentrations of artificial light. The existing aviation lights of Beinn an Tuirc (Phase 3) can be experienced from sub-area B, in the context of the Kintyre uplands to the north, across Machrihanish Bay. While settlement within Sub-Area A is more scattered, baseline lighting is present in the form of smaller settlement clusters and scattered properties, as well as passing vehicles along the A83 which runs through this sub-area. The existing aviation lights of Blary Hill and Auchadaduie can be experienced in the easterly context from around Glenbarr. Sensitivity is considered to be low - medium within Sub-Area A, and B and low within Sub-Area C.
- 4.4.11 Within Sub-Area A, the lit turbines would be experienced intermittently when traveling through this LCT, although they would often be contained from lower areas by the bluff slopes which separate this landscape from the interior uplands, and would most often be experienced from the top of the bluff slopes, or from more open areas such as around Glenbarr. The perceived intensity of the lighting would be reduced from much of this LCT, due the change in vertical angle. A range of 1-4 lit turbines would usually be experienced, with all five aviation lights visible from very localised, more elevated areas. Near Glenbarr (see VP2, **Figure V3b-2.6**), four of the lit turbines would be seen to the south-west, experienced in the context of the existing aviation lights of Blary Hill and Auchadaduie. This would result in a medium magnitude of change within localised parts of this sub-area at higher elevations and near Glenbarr, and a low magnitude elsewhere. It was assessed that the introduction of the aviation lights within the eastern landscape context would result in localised **moderate** (significant) effect at higher elevations and near Glenbarr and a **negligible** (not significant) effect elsewhere.
- 4.4.12 Within Sub-Area B, all five lit turbines would usually be experienced above the skyline. One aviation light associated with the Operational Development and the aviation lights of Beinn an Tuirc (Phase 3) are currently visible in a similar part of the wider context. This is anticipated to result in a perceptible ranging to a noticeable change, resulting in a low – medium magnitude of change. It was assessed that this would result in **minor – moderate** (not significant) overall effects.
- 4.4.13 Within Sub-Area C, 1-4 lit turbines would theoretically be visible from elevated areas to the south of Campbeltown, with all five lit turbines visible from very localised areas along the southern boundary of this LCT. They would generally be experienced at medium levels of intensity, on the skyline to the north-west, in the context of the lights of Campbeltown. It is anticipated that this would result in a negligible magnitude of change, leading to a **negligible** (not significant) overall effect.

LCT 58: Sand Dunes and Machair

- 4.4.14 The key characteristics of the LCT listed in the character assessment do not describe the landscape during hours of darkness. This is a landscape with generally low levels of artificial light, although some artificial light is present within the surrounding landscapes, including the lights from Campbeltown Airport, nearby agricultural buildings and from the settlement of Machrihanish. Existing aviation lighting at the Operational Development and Beinn an Tuirc (Phase 3) can be seen from some parts of the LCT. The

complex topography within the dune stacks may limit the visibility of lights within some areas.

- 4.4.15 All of the five lit turbines would be visible from much of this LCT apart from the northernmost areas. They would be experienced within the north-easterly context above the skyline, generally at medium intensity, sometimes in the context of existing visible aviation lights at Beinn an Tuirc (Phase 3).
- 4.4.16 The introduction of the aviation lighting to the north-east in a different LCT would result in a noticeable change within this LCT and a medium magnitude of change. It was assessed that the aviation lighting could therefore result in a **moderate** (significant) effect.

Designated and Protected Areas

- 4.4.17 No significant effects are anticipated from any of the designated or protected areas included within the assessment.

Effects Likely to be Not Significant

Landscape Character Types

LCT 47: Bay Farmland

- 4.4.18 The character of this LCT during hours of darkness is not specifically discussed within the NatureScot landscape character assessment. However, this is a relatively well-settled landscape, consisting of houses and farmsteads in a regular pattern and a well-established network of major and minor roads, including the A83. Baseline artificial lighting is concentrated particularly around the settlements of Stewarton, Drumlemble, Kilchenzie, as well as Campbeltown Airport and nearby agricultural buildings, which forms a prominent feature. The existing aviation lights of the Operational Development and Beinn an Tuirc (Phase 3) are perceptible above the northern skyline from parts of this LCT. While there is some baseline artificial lighting, this is a dark landscape at night with a distinctly rural character. This LCT is therefore considered to have a low – medium sensitivity to the proposed turbine lights.
- 4.4.19 Between one and five of the lit turbines would be visible above against the sky to the north, although the perceived intensity of the lighting would be reduced, due to the change in vertical angle. Where higher numbers of lit turbines would be visible from the southern and western parts of this LCT, they would be experienced occasionally in the context of existing visible aviation lights at Beinn an Tuirc (Phase 3).
- 4.4.20 The introduction of the visible aviation lighting in the context of containing hills to the north would result in a low - medium overall magnitude of change. This would represent a perceptible ranging to a notable change. It was assessed that this would result in **minor - moderate** (not significant) overall effect.

Inland Glen (LCT 53)

- 4.4.21 The character of this LCT during hours of darkness is not specifically discussed within the NatureScot landscape character assessment, however this is a rural landscape with a relatively dark character. Settlement consists of scattered properties and farms, which provide the main sources of artificial light, alongside passing lights from vehicles on the B842. From the northern parts of this LCT there are views north across Aros Moss, where lights associated with Campbeltown Airport and nearby settlements, agricultural

buildings and transport routes can be seen, as well as the aviation lights of the Operational Development and the Beinn an Tuirc (Phase 3) turbines. This landscape is considered to have a medium sensitivity.

- 4.4.22 Up to five of the lit turbines would be experienced, at medium intensity, from localised areas to the north where the glen opens up towards Aros Moss. They would be seen on the northern skyline from this part of the LCT, looking across the more settled landscapes of Aros Moss, and experienced in the context of the aviation lights of Beinn an Tuirc (Phase 3). The introduction of the aviation lighting to the north in a different LCT would result in a perceptible change within a localised part of this LCT and a localised low magnitude of change, with a negligible magnitude of change overall. It was assessed that the aviation lighting would result in a localised **minor** (not significant) effect within areas near the northern boundary of the LCT, with the overall effect being **negligible** (not significant).

LCT 54: Low Coastal Hills

- 4.4.23 The character of this LCT during hours of darkness is not specifically discussed within the NatureScot landscape character assessment, however this is a rural landscape with a relatively dark character. Baseline artificial lighting is focused along the coast around the settlement of Peninver, where the main sources of light are from residential properties, streetlights along the B842 and passing vehicles. This landscape is considered to have a medium sensitivity.
- 4.4.24 Usually between one and three lit turbines would be experienced within the inland context to the north-west, along Glen Lussa. Higher numbers of turbines would be experienced from upper glen slopes to the west near High Peninver, where 4-5 lit turbines may be seen. The aviation lights would usually be experienced at medium intensity. The introduction of aviation lights within the wider upland landscape, where lights are not currently a feature, would represent a perceptible change, ranging to a somewhat more noticeable change from the upper glen slopes within the western part of this LCT. This would result in a low magnitude of change, leading to a **minor** (not significant) effect overall.

LCT 55: Coastal Parallel Ridges (Gigha)

- 4.4.25 The character of this LCT during hours of darkness is not specifically discussed within the NatureScot landscape character assessment. This is a landscape with a distinctly rural character, which is dark at night. The main sources of artificial light come from scattered crofts and small settlement clusters, the largest of these being Ardmish, as well as passing vehicles on the minor road which runs through Gigha, and streetlights along the road to the ferry terminal. Some scattered lights are visible to the east from properties along the coast of Kintyre, and aviation lights of existing wind farms are perceptible on the Kintyre skyline. This landscape is considered to have a medium sensitivity.
- 4.4.26 All five lit turbines would often be visible from facing slopes on Gigha, seen above the Kintyre skyline to the south-east. They would generally be experienced at distances over 16km and therefore at reduced intensity, within a small part of the wider landscape context. The introduction of five lit turbines in the south-easterly landscape context would result in a negligible magnitude of change and a **negligible** (not significant) effect.

Designated and Protected Areas

North Arran NSA

- 4.4.27 The North Arran NSA comprises the spectacular Arran mountains which are characterised by complex ranges of distinctive and dramatic granitic pointed peaks, sharp ridges, steep glens and U-shaped valleys formed by glacial movements. The rugged and rocky moorland interior of the NSA contrasts with the surrounding coastal lowland which has been inhabited and managed since prehistoric times as evidenced by evocative remnants from different eras as well as modern forest plantations and pastoral fields found on the lower slopes. Further details on the special landscape qualities of the NSA are included in **Technical Appendix 5.4: Assessment of Designated and Protected Landscapes**. The special qualities for the NSA do not include reference to dark skies nor do they describe the landscape during hours of darkness. However, aspects of the *“contrast between the wild highland interior and the populated coastal strip”, “the historical landscape in miniature”* and *“an exceptional area for outdoor recreation”* SLQs may be sensitive to the introduction of artificial light during the hours of darkness.
- 4.4.28 Levels of artificial light are generally low within the upland interior itself, contributing to the wild characteristics. There are concentrations of artificial light around settlements along the coastal strip, including Pirnmill, Lochranza, Sannox and Corrie, associated with individual properties and headlights of passing vehicles on the A841 road which follows the coastline. These can be seen from some parts of the interior, contributing to the sense of contrast between these areas. Operational wind farms are present along the spine of Kintyre to the west, some of which feature aviation lighting. As a result, the NSA is considered to have a medium sensitivity to the proposed aviation lights.
- 4.4.29 Theoretical visibility of the aviation lights would be concentrated along summits and west-facing slopes within the interior of the NSA, including Beinn Bharrair (see VP23, **Figure V3b-15.6**) and other more distant mountains. All five lit turbines would be visible from the highest elevations, with the number of lit turbines visible and lighting intensity decreasing at lower elevations. However considering the distance of over 20km, the intensity of the lighting is likely to be reduced, becoming less perceptible.
- 4.4.30 The introduction of the aviation lights within a small part of the wider landscape context to the west where existing aviation lights are present would represent a barely perceptible distant change which would be localised to elevated areas within the NSA, and result in a negligible magnitude of change. The introduction of the aviation lighting would be very unlikely to lead to any discernible reduction to the scenic quality of the NSA at night or to change the intrinsic landscape characteristics or special landscape qualities of the NSA. It was therefore assessed that the aviation lighting would result in a **negligible** (not significant) effect on the NSA.

WLA 03: North Arran

- 4.4.31 The WLA is located around 23km to the north-east of the Proposed Varied Development and encompasses inland valleys and peaks across the northern part of the Isle of Arran. The Key Qualities of the WLA do not include reference to dark skies nor do they describe the landscape during hours of darkness. However, the WLA's key quality, most closely related to sanctuary, solitude and remoteness would be intensified by the dark, namely:
- WLQ1: A readily accessible area, but with strong wild land attributes, especially within the remote interior

- 4.4.32 The exterior parts of the WLA already experience some degree of artificial light during the hours of darkness. This takes the form of lights from settlements along the surrounding coastline, associated with individual properties and headlights of passing vehicles on the A841 road. Operational wind farms are present along the spine of Kintyre to the west, with some of these featuring aviation lights. However, the WLA's sense of isolation and remoteness are undoubtedly enhanced by the largely dark nature of the surrounding landscape at night. While the WLA itself would be sensitive to the introduction of artificial lighting within its boundaries, the aviation lighting on the Proposed Varied Development would be located over 20km to the west.
- 4.4.33 Theoretical visibility of the aviation lights would be concentrated along higher summits and west-facing slopes, including Beinn Bharrain (see VP23, **Figure V3b-15.6**) and other more distant mountains. All five lit turbines would be visible from the highest elevations, with the number of lit turbines visible and lighting intensity decreasing at lower elevations. However considering the distance of over 20km, the intensity of the lighting is likely to be reduced, becoming less perceptible at further distances.
- 4.4.34 Given the other sources of artificial lighting within the wider landscape, including aviation lighting associated with operational wind farms along the spine of Kintyre, the Proposed Varied Development aviation lighting would not introduce a new feature into the surrounding landscape context during the hours of darkness.,
- 4.4.35 The aviation lights would be seen outside of the WLA in a context where lighting is already a feature in the landscape, resulting in a barely perceptible, distant change, which would be localised to elevated areas within the WLA. It is anticipated that this would result in a negligible magnitude of change which is unlikely to result in any changes to the perceived accessibility or sense of remoteness and sanctuary that contribute to WLQ1. No significant effects are anticipated for any of the WLQ's and it was assessed that the effect on the WLA would be **negligible** (not significant).

Mull of Kintyre LLA

- 4.4.36 This LLA, located 10.8km south from the Proposed Varied Development, encompasses the southernmost end of the Kintyre Peninsula and Sanda Island to its south. Details on the key characteristics of this LLA are included in **Technical Appendix 5.4: Assessment of Designated and Protected Landscapes**. This is a dark, rural landscape, with relatively few sources of artificial light, particularly in the moorland interior. Artificial light is present to some degree within the more settled glens and farmed coastal plain, including the settlement of Southend, associated with lights from residential properties, and intermittent lights from passing vehicles along the B842 through Glen Conie and minor roads. The lights of the Mull of Kintyre lighthouse within the south-western part of the LLA can be seen from nearby areas along the coast. To the north, lights associated with more settled areas around Aros Moss, as well as Campbeltown Airport and large agricultural buildings near the airport, are visible from some north-facing slopes. Aviation lights associated with the Operational Development, and Auchadaduie, Blary Hill and Beinn an Tuirc (Phase 3) are occasionally visible on the northern skyline from the more northern parts of the LLA. The strong remote and secluded character of this LLA, and qualities of wildness associated particularly with the moorland hills within the south-western part of the LLA, may be sensitive to the introduction of artificial light. The LLA is considered to have a medium sensitivity to the proposed aviation lights.

- 4.4.37 Theoretical visibility of the aviation lights would generally be limited to upper, north-facing slopes, particularly within the western part of the LLA. Between one and five lit turbines would be visible from parts of the LLA, with the numbers of lit turbines visible increasing at higher elevations. The lights would be seen at medium-high intensity, and would be experienced in the northern landscape context, on the skyline across Aros Moss, in a similar area as the existing aviation lights. When moving further south, the aviation lights would appear less bright with the increasing distance, from the hills within the south-western part of the LLA. Occasionally forest would limit visibility.
- 4.4.38 The introduction of the aviation lighting to the north of the LLA would result in a perceptible ranging to noticeable change within the wider landscape context. This would represent a low – medium magnitude of change. While the aviation lights may slightly reduce the remote and secluded character of the LLA within localised areas, they would appear distant or not perceptible at all from the more sensitive areas to the south-west. They would be experienced within a part of the wider landscape where artificial light is already present and would not introduce a new feature into the surrounding landscape context. It is anticipated that this would result in a localised **minor – moderate** (not significant) effect within the northern part of the LLA, and a **negligible** (not significant) effect elsewhere.

West Kintyre Coast LLA

- 4.4.39 This LLA is located 1.2km from the Proposed Varied Development and extends along the western coast of Kintyre peninsula from Westport northward to Corran Point near Portachoilan, at the mouth of West Loch Tarbert. Details on the key characteristics of this LLA are included in **Technical Appendix 5.4: Assessment of Designated and Protected Landscapes**. Levels of artificial light are generally low, with the main sources of artificial light comprising smaller settlements and scattered properties along the coastal strip, as well as passing vehicles along the A83 which follows the coastline of western Kintyre. The aviation light on one of the Operational Development turbines would be briefly visible near Glenbarr. These scattered lights are generally concentrated at lower levels giving the landscape a generally dark, rural character considered to have a medium sensitivity.
- 4.4.40 Theoretical visibility of the aviation lights would be intermittent, and focused to the south of Glencardoch Point, from where 1-4 lit turbines would be visible, with all five hubs visible from a very localised area to the south, on the bluff slopes near Port nam Marbh. Although they would be experienced in close proximity within the inland context to the east, the perceived intensity of the lighting would be reduced due to the change in vertical angle. They would represent a perceptible ranging to noticeable change, resulting in a low - medium magnitude of change within localised parts of the LLA, at higher elevations and near Glenbarr, and a low magnitude of change elsewhere.
- 4.4.41 The aviation lights would be experienced intermittently when traveling through the LLA, although they would often be contained from lower areas by the bluff slopes which separate this landscape from the interior uplands, and would most often be experienced from the top of the bluff slopes. Where experienced from lower elevations, they would likely appear distracting above the bluff slopes, within a part of the surrounding context where lights are usually not visible, with most other sources of artificial light concentrated at lower level, although from a short section near Glenbarr where the aviation light of the Operational Development is visible they would be seen in a similar context as this light, which they would be replacing. This is likely to detract from some of the dark, rural

qualities of this landscape, resulting in a localised **minor - moderate** (not significant) effect at higher elevations and near Glenbarr and a **negligible** (not significant) effect elsewhere.

Summary of Visible Aviation Lighting Effects on LCTs and Landscape Designations / Protected Areas

- 4.4.42 Anticipated effects on designated and protected landscapes and LCTs are summarised in Table 5 below. For the purposes of this assessment, effects with a **moderate** rating or greater are considered to be significant.

Table 5: Summary of Visible Aviation Lighting Effects on LCTs and Landscape Designations / Protected Areas

	Not Significant			Significant		
	Negligible	Minor	Minor - Moderate	Moderate	Moderate - Major	Major
LCT 39: Plateau Moor and Forest (previously Upland Forest-Moor Mosaic in 1996 Landscape Assessment of Argyll and the Firth of Clyde) – Sub-Area A		x		L		
LCT 39: Plateau Moor and Forest (previously Upland Forest-Moor Mosaic in 1996 Landscape Assessment of Argyll and the Firth of Clyde) – Sub-Area B		x				
LCT 47: Bay Farmland			x			
LCT 53: Rocky Coastland – Argyll (previously Rocky Mosaic in 1996 Landscape Assessment of Argyll and the Firth of Clyde) – Sub-Area A	x			L		
LCT 53: Rocky Coastland – Argyll (previously Rocky Mosaic in 1996 Landscape Assessment of Argyll and the Firth of Clyde) – Sub-Area B			x			
LCT 53: Rocky Coastland – Argyll (previously Rocky Mosaic in 1996 Landscape Assessment of Argyll and the Firth of Clyde) – Sub-Area C	x					
Inland Glen (LCT 53)	x	L				
LCT 54: Low Coastal Hills		x				
LCT 55: Coastal Parallel Ridges	x					
LCT 58: Sand Dunes and Machair				x		
North Arran NSA	x					
WLA 03: North Arran	x					
Mull of Kintyre LLA	x		L			
West Kintyre Coast LLA	x		L			

Note: L denotes an effect which would be localised only.

4.5 Visible Aviation Lighting Effects on Visual Receptors

Viewpoints

4.5.1 All of the 18 viewpoints included in the LVIA fall within the study area for the aviation lighting assessment. However, two of these VPs have been scoped out (VP4 – Islay Ferry Route, and VP28 – Dougarie Point, both assessed as experiencing a **negligible** effect within the visual assessment, see **Technical Appendix 5.7: Visual Assessment Tables** for further details) as significant effects were considered unlikely. The 16 VPs included are considered to be representative of the range of views likely to be obtained during low light or dark conditions. Wirelines indicating turbines which would be lit are provided for all VPs included within the LVIA (**Figures V3b-1.4a - V3b-18.4a**). In consultation with NatureScot three of these viewpoints were selected as the locations for visualisations of the aviation lighting. These are marked with an asterisk below.

- VP1 - A83 at Glenbarr Burial Ground;
- VP2 - Glenbarr War Memorial*;
- VP5 - Gigha (South Pier);
- VP6 - Machrihanish (Little Scone)*;
- VP8 - Southend Road;
- VP9 - Campbeltown (Ralston Road);
- VP10 - Beinn Ghuilean;
- VP12 - Bord a Dubh (Kintyre Way);
- VP16 – Kilbrannan;
- VP17 – Breakachy;
- VP18 - Skeroblingarry (Kintyre Way);
- VP19 – Drumlemble;
- VP21 - B842 North of Peninver;
- VP23 - Beinn Bharrain*;
- VP24 - Sea near Machrihanish; and
- VP27 - Machrihanish Dunes.

Settlements and Residential Receptors

4.5.2 Settlement within the study area is focused within the agricultural plain around Aros Moss and along the coastline of Kintyre, around the main settlements of Campbeltown, Machrihanish, Kilchenzie, Drumlemble, Glenbarr and Peninver, with scattered properties situated within some of the sheltered glens which intrude into the upland areas within central Kintyre. As indicated on **Figure TA5.10-5 - Visible Aviation Lighting Visual Receptors with Theoretical Intensity ZTV**, theoretical visibility of aviation lighting would be focused around Aros Moss and coastal areas to the west of Kintyre, where there would be theoretical visibility of the lit turbines from Machrihanish, Drumlemble, Stewarton, RAF Machrihanish, and from part of Kilchenzie. Theoretical visibility is limited from Campbeltown and would be further reduced by screening from buildings.

4.5.3 Artificial lighting is present in each of these communities in the form of streetlights, domestic lights and other lights such as those of Campbeltown Airport and large agricultural buildings. Aviation lighting on operational turbines along the spine of Kintyre

can also be seen from many of these areas. While these are not brightly lit landscapes it is unlikely that the introduction of the proposed aviation lighting would be perceptibly detracting even on the outskirts given the existing baseline lighting and screening by trees and buildings.

- 4.5.4 The following residential receptors within the study area were identified as having the potential to experience effects as a result of the aviation lighting (see **Figure TA5.10-5 - Visible Aviation Lighting Visual Receptors with Theoretical Intensity ZTV**).

- R3 – Drumlemble;
- R4 – Glenbarr;
- R5 – Kilchenzie;
- R7 – Machrihanish;
- R9 – RAF Machrihanish;
- R10 – Stewarton; and
- R11 - Tangy Village and other properties to the east of the A83.

Routes

- 4.5.5 Based on the visible aviation lighting ZTV, the following route receptors within the Study Area were identified as having the potential to experience effects as a result of the aviation lighting (see **Figure TA5.10-5 - Visible Aviation Lighting Visual Receptors with Theoretical Intensity ZTV**):

- A83, including Core Path C304;
- B842, including Core Path C084 and part of NCR78;
- B843 and Core Path C085;
- Kintyre Way: Carradale to Campbeltown and Section of Core Path C088;
- Kintyre Way: Southend to Machrihanish and Section of Core Path C090;
- Core Path C086;
- Core Path C089;
- Core Paths C087, C447 & C448;
- Core Path C083; and
- Core Path C091.

Effects Likely to be Significant

- 4.5.6 The majority of the representative VPs, residential groupings, and routes were selected for inclusion within the aviation lighting assessment, have been identified as likely to experience similar levels of effects to those identified in the main LVIA during the hours of daylight (**Chapter 5: Landscape and Visual**). Receptors identified as likely to experience significant visual effects as a result of the aviation lighting discussed below.

Viewpoints

VP1 - A83 at Glenbarr Burial Ground

- 4.5.7 This VP is representative of views from the A83 within the West Kintyre Coast LLA and illustrates views from the burial ground to the north of the Site. During the day, expansive views are obtained towards the sea to the north, west and south, along the coast. The

Operational Development is visible on the skyline to the south. The settlement of Bellochantuy is also visible in this direction. The walled burial ground features in the foreground in westerly coastal views, while views east are contained by bluff slopes. Much of this detail is lost during the hours of darkness as baseline artificial lighting is limited, consisting mainly of domestic lights associated with the settlement of Bellochantuy, and other properties along the coastline, as well as lights of passing vehicles along the A83.

- 4.5.8 The wireline for this VP (see **Figure V3b-1.4a - VP1 A83 at Glenbarr Burial Ground - Proposed Varied Development Wireline**) shows that three of the aviation lights would be visible in southerly views above the bluff slopes in relatively close proximity, where they would form a new and relatively noticeable feature in nighttime views. Although there is some baseline artificial lighting present, this is mainly at lower level, and the aviation lights of the Proposed Varied Development would introduce lights into a different part of the view, seen above the skyline, when travelling south along the A83. However dark skies would still be experienced in other directions.
- 4.5.9 The introduction of aviation lighting on the Proposed Varied Development would result in a low - medium magnitude of change to a viewpoint with medium visual sensitivity. It was assessed that this introduction would form a noticeable feature within the view and result in a **minor - moderate** (not significant) effect to the viewpoint.

VP2 - Glenbarr War Memorial

- 4.5.10 This VP is representative of views from northern Glenbarr and illustrates views from receptors visiting this memorial or travelling along the A83, to the north of the Site. During daytime there are panoramic views, although the principal view for travellers is in the direction of travel (i.e. north or south). Side views to the east feature the monument as a primary focus in the foreground, with the turbines at Beinn an Tuirc Phase (Phase 1), Auchadaduie and Blary Hill seen inland, on the skyline. Views west are toward the sea, with Gigha, Jura and Islay visible in the distance. As the sun sets, views are more likely to be focused to the west towards the sea as other features fade. Some baseline artificial lighting is present, consisting of lights from nearby properties, and passing vehicles along the A83, and more distant lights along the coast to the south, around Machrihanish, as well as on Gigha to the west. The aviation lights of Auchadaduie and Blary Hill are also visible to the east.
- 4.5.11 Four of the lit hubs would be visible from this viewpoint above the skyline to the south, at a distance of approximately 7km. While it would introduce lights to a new part of this view, it would be experienced in the context of domestic lights at lower level in this direction, and the aviation lights of other wind farms further to the east. As such, the introduction of aviation lighting on the Proposed Varied Development would result in a low - medium magnitude of change to a viewpoint with low-medium visual sensitivity. It was assessed that this would result in a **minor - moderate** (not significant) effect to the viewpoint.

VP5 - Gigha (South Pier)

- 4.5.12 This VP is illustrative of open views from the coast of southern Gigha, to the north of the Site (but is not representative of views from Ardminish). Daytime views are expansive to the south and east, towards the islands of Gigha and Cara in the midground and the Kintyre coast and uplands in the distance. At night domestic lights from some nearby

properties are visible in views west, with more distant lights visible along the Kintyre Coast, from properties and possibly distant headlights of vehicles along the A83. There are flood lights on the nearby pier which could be on if the pier is in use at night. The aviation lights of Auchadaduie, Beinn an Tuirc (Phase 3) and Blary Hill may be visible on the along the spine of Kintyre, although they are likely to appear as small and distant sources of light.

- 4.5.13 The aviation lights on all five lit turbines would be visible from this viewpoint, seen above the skyline to the south-east, at a distance of approximately 16km. Considering the distance, and the presence of existing aviation lights on the Kintyre skyline, this would represent a barely perceptible change to the view, affecting a small part of the overall expansive views obtained from this VP. This would result in a low magnitude of change to a viewpoint with medium visual sensitivity. It was assessed that this would result in a **minor** (not significant) effect to the viewpoint.

Machrihanish (Little Scone)

- 4.5.14 This VP is representative of views from Machrihanish settlement. During daytime, main views are north along the sandy beach and west coastline of Kintyre and westward over the sea. Views include scattered properties along the distant coast and more concentrated development at Campbeltown airport and nearby agricultural buildings. Oblique, side and rear views also include the buildings of Machrihanish settlement and the B843 road. As the sun sets, views are more likely to be focused to the west towards the sea as other features fade. At nighttime, this is a relatively well-lit landscape, with baseline artificial light from nearby properties and streetlights within Machrihanish, as well as passing headlights along the B843. Distant lights are visible along the coastline to the north, and existing aviation lights are visible on the skyline.
- 4.5.15 All five lit hubs would be visible from this VP, seen above the skyline in main northerly views, at a distance of approximately 8km (see **Figure V3b-5.6: VP6 Machrihanish Seating Area (Little Scone) - Visible Aviation Lighting Photomontage**). While existing aviation lighting is already visible within this part of the view, the aviation lights of the Proposed Varied Development would introduce additional lights within the view.
- 4.5.16 The introduction of aviation lighting on the Proposed Varied Development would result in a medium magnitude of change to a viewpoint with low-medium visual sensitivity. It was assessed that this introduction would form a somewhat noticeable feature given the existing baseline lighting within Machrihanish and result in a **minor - moderate** (not significant) effect to the viewpoint.

VP8 - Southend Road

- 4.5.17 This VP is representative of elevated views from the B842 approaching Stewarton, including those nearby scattered properties with similar views, to the south of the Site. During daytime, there are elevated expansive views to the north across Aros Moss, including scattered farmsteads and settlement amongst low flat fields. At nighttime, this is generally a dark landscape, with some baseline artificial lighting present in the form of domestic and agricultural lights from scattered properties and farms, and occasional lights from passing vehicles. More distant lights from settlements around Aros Moss, as well as Campbeltown Airport and nearby agricultural buildings are also visible. The aviation lights of the Operational Development, and Beinn an Tuirc (Phase 3) are visible on the skyline to the north.

4.5.18 All five lit turbines would be visible on the skyline to the north-west from this VP, at a distance of approximately 10km. While existing aviation lighting is already visible within this part of the view, the aviation lights of the Proposed Varied Development would introduce additional lights within the view. However, they would occupy a relatively small part of the overall view.

4.5.19 Therefore, the introduction of aviation lighting on the Proposed Varied Development would result in a low - medium magnitude of change to a viewpoint with medium visual sensitivity. It was assessed that this would result in a **minor - moderate** (not significant) effect to the viewpoint.

VP9 - Campbeltown (Ralston Road)

4.5.20 This VP is illustrative of open views from the south-western periphery of Campbeltown, to the south-east of the Site, although it is not representative of views from most of Campbeltown. During daytime, main views are to the north-west across Ralston Road, over adjacent fields with areas of low-lying housing and further rolling pasture beyond, towards rugged open moorland and conifer plantation on the skyline. The Operational Development turbines are barely perceptible in the distance. Views in other directions are contained and framed by nearby housing. At nighttime, this is a relatively well-lit landscape, with baseline artificial lighting present in the form of streetlights along the road, lights from surrounding properties, and the lights from passing cars.

4.5.21 Three lit hubs would be visible along the skyline to the north-west, at a distance of approximately 9km. They would be experienced in the context where a relatively high degree of baseline artificial lighting is already present in views, although they would be seen in the context of the less developed upland interior, in a part of the view where lights are currently not present. It is anticipated that this would result in a low magnitude of change to a viewpoint with low sensitivity. It was assessed that this introduction would result in a **minor** (not significant) effect to the viewpoint.

VP10 - Beinn Ghuilean

4.5.22 This VP is illustrative of elevated views from a hillside seating area south of Campbeltown and south-east of the Site. During daytime there are panoramic views to the north over Campbeltown, with Campbeltown Loch and Crosshill Loch, Aros Moss and the upland interior of Kintyre visible beyond. At nighttime, while the immediate surroundings of this VP are relatively dark, the lights of Campbeltown are visible to the north, resulting in a large concentration of artificial light. Beyond this, more scattered lights from smaller settlements and individual properties can be seen within Aros Moss, as well as distant lights from cars along the A83 and B843 roads which traverse Aros Moss. The aviation lights of the Operational Development, Beinn an Tuirc (Phase 3) and Blary Hill are perceptible on the skyline to the north.

4.5.23 All five lit hubs would be visible on the skyline in views north, at a distance of approximately 10km. The ZTV indicates that these would be experienced at their full intensity. While they would be experienced in the context of a landscape where a relatively high degree of baseline artificial lighting is already present around Campbeltown and Aros Moss, and within the context of the existing aviation lighting, the aviation lights of the Proposed Varied Development would introduce additional lighting, forming a perceptible feature within the view.

4.5.24 As such, the introduction of aviation lighting on the Proposed Varied Development would result in a medium magnitude of change to a viewpoint with low - medium visual

sensitivity. It was assessed that this would result in a **minor - moderate** (not significant) effect to the viewpoint.

VP12 - Bord a Dubh (Kintyre Way)

4.5.25 This VP is illustrative of views from an elevated point north-east of the Site on the Kintyre Way (on the Carradale to Campbeltown section) near Bord a Dubh. During daytime, there are main elevated views south-west along a forested valley, towards Lussa Loch and a loch side property, and the meandering river along the valley floor. Rear and side views are contained by valley sides and mature plantation. The details of the view would fade during the hours of darkness leaving a generally dark landscape, with little artificial light apart from the lights of the loch side property.

4.5.26 Two of the lit hubs would be visible in views south-west, on the skyline above Lussa Loch, above forest, in relatively close proximity (approximately 4km away). They would result in a relatively noticeable change within a view where there is limited baseline artificial lighting. The introduction of aviation lighting on the Proposed Varied Development would therefore result in a medium magnitude of change to a viewpoint with medium - high visual sensitivity. It was assessed that this would result in a **moderate** (significant) effect to the viewpoint.

VP16 – Kilbrannan

4.5.27 This VP illustrates views from a point on the ferry route between Ardrossan and Campbeltown, an important transport route for residents and tourists, to the south-east of the Site. In daytime, there are 360° open panoramic views in multiple directions. At night, this is a relatively dark landscape, although some baseline artificial lighting is present from settlements including Campbeltown, Peninver and Carradale along the Kintyre coastline, with some lights also visible along the coast of Arran to the north-east. Occasional lights from passing cars along the B842 which follows the east Kintyre coast, and the A841 along the coast of Arran may also be visible as well as any passing marine vessels. The lighthouse on Island Davaar is visible in close proximity to the west. The aviation lights of Beinn an Tuirc (Phase 3) are visible above the Kintyre skyline to the north-west.

4.5.28 Three of the lit hubs would be visible from this VP, seen above the skyline to the north-west in a dip in the landform, at a distance of approximately 16km. While the ZTV indicates that they would be experienced at a medium-high intensity, this would likely be reduced by distance. The aviation lights would be experienced within a context with some existing baseline lighting, including aviation lights from existing wind farms in a similar part of the view. It is therefore anticipated that the introduction of the aviation lights would result in a low magnitude of change to a viewpoint with medium visual sensitivity. It was assessed that this would result in a **minor** (not significant) effect to the viewpoint.

VP17 - Breakachy

4.5.29 This VP is representative of close-range elevated views from the south-west of the Site. During daytime, main views are to the north, where the Operational Development turbines are prominent nearby. The details of the view would fade during the hours of darkness leaving a generally dark landscape, although some baseline artificial lighting is present, including domestic and agricultural lights from nearby properties, the aviation light on one of the Operational Development turbines, and the aviation lights of Beinn an Tuirc (Phase 3) further in the distance.

- 4.5.30 All five lit hubs would be visible from this VP in close proximity to the north (approximately 1km away). While they would be seen in a similar part of the view as the existing aviation light of the Operational Development, which they would be replacing, they would introduce additional lighting into this part of the view. Although the perceived intensity of the lighting would be somewhat reduced, due the change in vertical angle, given to the close proximity, they are likely to appear very noticeable.
- 4.5.31 It is therefore anticipated that the introduction of the aviation lights would result in a medium – high magnitude of change to a viewpoint with medium visual sensitivity. It was assessed that this would result in a **moderate - major** (significant) effect to the viewpoint.

VP18 - Skeroblingarry (Kintyre Way)

- 4.5.32 This VP is representative of views from a section of public road and the Kintyre Way near Skeroblin Cruach, to the south-east of the Site, which during the daytime has 360° views of undulating fields and farmsteads within the agricultural fringe of Kintyre's upland interior. Coniferous plantations and moorland, characteristic of the upland forest-moor mosaic, are visible nearby, with areas of felling. At nighttime, this is a dark landscape, with some baseline artificial lighting present in the form of domestic lights from nearby scattered properties, and occasional lights from vehicles accessing these properties.
- 4.5.33 One lit turbine (T5, which would be permanently reduced to 200 candela) would be visible from this VP on the skyline in views to the north-east in relatively close proximity (approximately 2.5km). The perceived intensity of the lighting would be reduced, due the change in vertical angle. While it would introduce lights into a landscape where there is little baseline lighting, it would represent a change to a small part of the overall view. This would result in a low magnitude of change to a viewpoint with medium visual sensitivity. It was assessed that this would result in a **minor** (not significant) effect to the viewpoint.

VP19 – Drumlemble

- 4.5.34 This VP is representative of views from the northern periphery of Drumlemble settlement on the A83 road, to the south of the Site. During the daytime, main views from this settlement are to the north across Aros Moss. The details of the view would fade during the hours of darkness, leaving a somewhat dark landscape, although baseline artificial lighting is present, associated with domestic lights from properties within this settlement, more distant scattered properties on Aros Moss, streetlights, lights from passing vehicles along the A83 road, and the lights of Campbeltown Airport and large agricultural buildings. Existing aviation lights are visible on the skyline to the north.
- 4.5.35 All five lit turbines would be visible from this VP on the skyline in views north across Aros Moss, at a distance of approximately 8km. While they would be seen in a similar part of the view as the existing aviation light of the Operational Development, which they would be replacing, and in the context of the Beinn an Tuirc (Phase 3) aviation lights, they would introduce additional lighting into this part of the view resulting a noticeable but distant change.
- 4.5.36 As such, the introduction of aviation lighting on the Proposed Varied Development would result in a medium magnitude of change to a viewpoint with low - medium visual sensitivity. It was assessed that this would result in a **minor - moderate** (not significant) effect to the viewpoint.

VP21 - B842 North of Peninver

- 4.5.37 This VP is illustrative of views from a short section of the coastal B842 road to the east of the Site and views from some scattered properties to the north of Peninver. During daytime there are main open coastal views to the east, across Kilbrannan Sound to Arran. To the south, views are along the road towards the settlement of Peninver. At night this is a relatively dark landscape, although some baseline artificial lighting is present in the form of domestic lights from Peninver and surrounding scattered properties and occasional lights from passing vehicles along the B842.
- 4.5.38 Three lit turbines would be theoretically visible from this VP in inland views to the north-west, however they would be screened by forest on the skyline. As such, the introduction of aviation lighting on the Proposed Varied Development would result in a negligible magnitude of change to a viewpoint with medium visual sensitivity. It was assessed that this would result in a **negligible** (not significant) effect to the viewpoint.

VP23 - Beinn Bharrain

- 4.5.39 This VP is illustrative of elevated views from a mountain summit on Arran, to the north-east of the Site, within the North Arran NSA and WLA. During daytime, elevated 360° panoramic views can be obtained, looking out towards Kilbrannan Sound to the west, to the Kintyre peninsula with Islay and Jura visible on the horizon beyond. At night, this is a dark landscape, with low levels of artificial light. Distant lights from settlements along the coast of Arran, and along the coastline of Kintyre are visible, and aviation lights feature on some of the wind farms along the Kintyre skyline to the west. Anyone accessing this VP during hours of darkness would be likely to carry their own light source.
- 4.5.40 All five lit turbines would be visible on the skyline in views to the south-west from this VP. At a distance of approximately 24km the perceived intensity of the lights would be greatly reduced. The aviation lights would occupy a small part of the expansive overall view, where dark skies would still be experienced in other directions. They would be experienced in the context of aviation lights from other wind farms along the Kintyre skyline and are considered likely to result in a barely perceptible change in the view.
- 4.5.41 As such, the introduction of aviation lighting on the Proposed Varied Development would result in a negligible magnitude of change to a viewpoint with medium - high visual sensitivity. It was assessed that this would result in a **negligible** (not significant) effect to the viewpoint.

VP24 - Sea near Machrihanish

- 4.5.42 This VP is representative of views from water-based users in Machrihanish Bay, to the south-west of the site. During daytime, there are 360° panoramic main views from the open water. At night, this is a dark landscape, although some baseline lighting is present around Machrihanish Bay from the settlement of Machrihanish and scattered properties along the coastline, associated with domestic lights, streetlights within Machrihanish, occasional lights from passing vehicles on the B843, as well as the lights of Campbeltown Airport and large agricultural buildings near the airport. The aviation light on one of the Operational Development turbines is visible on the skyline to the north.
- 4.5.43 All five lit turbines would be visible from this VP, seen above the skyline in northerly views, at a distance of approximately 7km. While they would be seen in a similar part of the view as the existing aviation light of the Operational Development, which they would be replacing, they would introduce additional lighting into this part of the view, which

may appear somewhat noticeable at this distance. However, due to the panoramic nature of the views obtained from this VP, they would occupy a relatively small part of the overall view.

- 4.5.44 As such, the introduction of aviation lighting on the Proposed Varied Development would result in a medium magnitude of change to a viewpoint with medium visual sensitivity. It was assessed that this introduction would result in a **moderate** (significant) effect to the viewpoint.

VP27 - Machrihanish Dunes

- 4.5.45 This VP is representative of views from Machrihanish Dunes golf course, taken from near the clubhouse. During daytime, there are wide panoramic views across open dunes, coastal views to the west and south and northerly views towards the Kintyre uplands. This is a relatively dark landscape at night, although there is some baseline artificial lighting present from nearby properties, large agricultural buildings and Campbeltown Airport. The aviation light on one of the Operational Development turbines is visible on the skyline to the north.
- 4.5.46 All five lit turbines would be visible from this VP on the skyline in northern views, at a distance of approximately 4km. While they would be seen in a similar part of the view as the existing aviation light of the Operational Development, which they would be replacing, they would introduce additional lighting into this part of the view, which may appear noticeable at this distance.
- 4.5.47 As such, the introduction of aviation lighting on the Proposed Varied Development would result in a medium magnitude of change to a viewpoint with medium visual sensitivity. It was assessed that this introduction would result in a **moderate** (significant) effect to the viewpoint.

Settlements and Residential Receptors

R3 – Drumlemble

- 4.5.48 This grouping is representative of views obtained from the settlement of Drumlemble, situated along the B843. These properties have main views during the day north across Aros Moss towards Campbeltown Airport and the Operational Development on the skyline. Baseline artificial lighting comprises lights from the properties themselves and more distant scattered properties on Aros Moss, streetlights and lights from passing vehicles along the A83, and the lights of Campbeltown Airport and large agricultural buildings near the airport. Existing aviation lights are visible on the skyline to the north. This residential grouping is considered to have a medium sensitivity.
- 4.5.49 The ZTV shows that all five lit hubs would be visible from this receptor grouping, on the skyline across Aros Moss, at a distance of approximately 8km. While they would be seen in a similar part of the view as the existing aviation light of the Operational Development, which they would be replacing, and in the context of the Beinn an Tuirc (Phase 3) aviation lights, they would introduce additional lighting into this part of the view. It is considered that this would result in a low - medium magnitude of change, leading to a **minor - moderate** (not significant) effect to the residential grouping.

R4 - Glenbarr

- 4.5.50 This grouping is representative of views obtained from a range of properties located to the east of the A83, divided into two distinct clusters. During daytime main views from

receptors in northern Glenbarr are elevated and looking south, across an adjacent field, to the forested ridge and slopes at Blary Hill, south of Barr Glen, with the Operational Development seen above coniferous forest plantation. Main views from receptors in southern Glenbarr are more contained and are oriented east-west, with some views of the Operational Development in views from side windows and from public areas. Some baseline artificial lighting is present within the area, consisting of lights from nearby properties, and more distant lights along the coast from properties with more open aspects, as well as passing vehicles along the A83 and streetlights within southern Glenbarr. The aviation lights of Auchadaduie and Blary Hill are visible from some properties with open views to the east. This residential grouping was considered to have a low - medium sensitivity.

- 4.5.51 The ZTV shows that up to four of the aviation lights would be theoretically visible from parts of this receptor grouping. They would be seen on the skyline, above coniferous forest plantation from receptors within northern Glenbarr, in a manner similar to VP2. From the more elevated parts of southern Glenbarr, they would be seen in side views from properties partially screened by neighbouring buildings and/or vegetation. They would not be visible from the southernmost properties. They would be seen in a part of the view where no artificial lighting is currently visible, although aviation lights from other wind farms would be visible in a different direction. It is considered that this would result in a low - medium magnitude of change, leading to a **minor - moderate** (not significant) effect to the residential grouping.

R5 - Kilchenzie

- 4.5.52 This grouping is representative of views obtained from a group of properties situated on either side of the A83 forming two distinct clusters. During daytime main views are in a mixture of directions, generally open onto the surrounding pastoral farmland. At night, this is a relatively dark landscape where baseline lighting is generally limited to domestic lights from nearby properties, and passing lights from vehicles along the A83, and access roads to these properties. This residential grouping was considered to have a medium sensitivity.
- 4.5.53 The ZTV shows that 1-2 lit turbines would be theoretically visible from some properties within the southern and western part of this receptor grouping. They would be seen in relatively close proximity, albeit the perceived intensity of the lighting would be reduced, due the change in vertical angle. They would be seen on the skyline in main and side views to the north from those properties and gardens which experience north-easterly views. This would result in a perceptible change to a part of the view with limited baseline artificial lighting, although it would affect a small part of the overall view. It is considered that this would result in a low magnitude of change, leading to a **minor** (not significant) effect to the residential grouping.

R7 - Machrihanish

- 4.5.54 This grouping is representative of views obtained from a linear coastal settlement, located on the B843, by Machrihanish Bay. During daytime, main open views are to the north along the coast, across the Links of Machrihanish, towards Aros Moss, the Kintyre Uplands and the Operational Development. As the sun sets, views are more likely to be focused to the west towards the sea as other features fade. There is a general level of baseline artificial light from properties and streetlights within this settlement, as well as passing headlights along the B843. Distant lights are visible along the coastline to the

north, and the aviation lights of the Operational Development and Beinn an Tuirc (Phase 3) are visible on the skyline. This residential grouping was considered to have a medium sensitivity.

- 4.5.55 All 5 lit hubs would be visible from this grouping, seen above the skyline in main northerly views. They are likely to be screened by buildings from receptors in properties in southern Machrihanish. Views from VP6 are illustrative of more open views from this settlement (see **Figure V3b-5.6: VP6 Machrihanish Seating Area (Little Scone) - Visible Aviation Lighting Photomontage**). While existing aviation lighting is already visible within this part of the view, the aviation lights of the Proposed Varied Development would introduce additional lights within the view. It is considered that this would result in a low - medium magnitude of change, leading to a **minor - moderate** (not significant) effect to the residential grouping.

R9 – RAF Machrihanish

- 4.5.56 This grouping is representative of views obtained from a settlement, comprising generally terraced and semi-detached two storey properties, on both sides of a local access road between Craigs and the former air base facilities. During daytime, these properties have views across open fields to the Kintyre Uplands or to Aros Moss and nearby airport infrastructure. Properties on the northern and northern-east fringe with views to the north have limited views of the Operational Development turbine tips. During the hours of darkness, the details of the surrounding landscapes would fade. There is some baseline artificial lighting present, from properties within this settlement, as well as from other scattered properties, from streetlights and from the nearby Campbeltown Airport and large agricultural buildings. This residential grouping was considered to have a medium sensitivity.
- 4.5.57 Between one and five lit turbines would be theoretically visible from this grouping, seen above the skyline from those properties and open spaces, generally situated on the edge of the settlement, which experience northerly views, while they are unlikely to be perceptible from properties with more inward-facing views. They would be seen within a part of the view where currently no artificial lighting is visible, resulting in a perceptible ranging to a noticeable change. It is considered that this would result in a low - medium magnitude of change, leading to a **minor - moderate** (not significant) effect to the residential grouping.

R10 – Stewarton

- 4.5.58 This grouping is representative of views obtained from a group of buildings mainly occupying an area around the junction of B842 and the B843, with main views mostly in an east/west direction. During daytime properties in the northernmost part of Stewarton, near the junction with the B843, have open main or oblique views to the north, across Aros Moss, with the Operational Development visible on the skyline. At nighttime, there is some baseline artificial light present, including lights from properties and streetlights within this settlement, lights from passing cars on the B842 and B843 roads, and lights from scattered properties on Aros Moss, as well as the lights of Campbeltown Airport and large agricultural buildings near the airport. This residential grouping was considered to have a medium sensitivity.
- 4.5.59 2-3 lit turbines would be theoretically visible from properties within this grouping, seen above the skyline in main or oblique views to the north from properties in the northernmost part of Stewarton which have open views out across Aros Moss. While

some artificial lighting is present within this view at lower level, the aviation lights would be seen above the hills where other lights are not currently visible. They would usually be perceived in the context of artificial lighting within the settlement. This would result in a low - medium magnitude of change, leading to a **minor - moderate** (not significant) effect to the residential grouping.

R11 - Tangy Village and other properties to the east of the A83

- 4.5.60 This grouping is representative of views obtained from properties to the east of the A83 consisting of a row of single storey terraced houses, individual detached properties and farms. During daytime, the majority of buildings are orientated such that main views are mostly in an east/west direction with eastern views over agricultural land and western views of the sea. At night, views would be out towards a relatively dark landscape, with low levels of baseline artificial lighting generally limited to the properties themselves, and occasional lights from vehicles accessing these properties. In coastal views west/south-west, distant lights would be visible around Machrihanish Bay. From some of the properties immediately to the south, the aviation light on one of the Operational Development turbines is visible in close proximity. This residential grouping was considered to have a medium sensitivity.
- 4.5.61 The ZTV shows that between one and five lit turbines would be visible from properties within this grouping, with higher numbers of turbines visible from properties within the southern part of this grouping. They would be seen in close proximity, albeit the perceived intensity of the lighting would be reduced, due the change in vertical angle. From some of the properties they would be replacing the aviation light of the Operational Development but adding new aviation lights within the view. From other properties they would represent a new feature in the view, seen in an otherwise dark part of the view. This would result in a medium - high magnitude of change, leading to a **moderate - major** (significant) effect to the residential grouping.

Routes

A83, including Core Path C304

- 4.5.62 This is the principal road north and south for those on the Kintyre Peninsula, connecting Campbeltown with Corranbuie, near West Tarbert. During daytime it has varied views, often focussed out to the sea, where the islands of Gigha, Islay and Jura are prominent features, with views inland usually enclosed by landform. From the southern section of the route there are views across Aros Moss over farmed fields. The level of baseline artificial lighting varies throughout this route. As the sun sets, views are more likely to be focused west towards the sea as other features fade. The main sources of artificial lights are from coastal settlements and scattered properties along this route, and from passing vehicles. From the southern section, lights from scattered properties and from Campbeltown Airport and large agricultural buildings are visible in views out towards Aros Moss. Near VP2 (see **Figure V3b-2.6: VP2 Glenbarr War Memorial - Visible Aviation Lighting Photomontage**) the aviation lights of Auchadaduie and Blary Hill are visible to the east. While sensitivity would vary, the overall sensitivity for this route is considered to be low - medium.
- 4.5.63 The ZTV shows that visibility of the aviation lights would be very intermittent along this route, focused mainly along a section of the route near Glenbarr, and in the vicinity of Drum Farm and Kilchenzie. Near Glenbarr, up to four lit turbines would be visible on the skyline in southerly views above the bluff slopes. Although there is some baseline artificial

lighting present around this section, this is mainly at lower level, and the aviation lights of the Proposed Varied Development would introduce lights into a different part of the view, seen above the skyline, which may be distracting for those travelling southward along this route (see VP1 and VP2). However other existing aviation lights would be visible in side views to the east. Around Kilchenzie, 1-2 lit turbines would be visible in side views, on the skyline to the north, generally at a reduced intensity, within an otherwise dark part of the view.

- 4.5.64 This would result in a locally medium magnitude of change near Glenbarr, a low magnitude of change in other areas where the aviation lights would be visible, and negligible magnitude of change elsewhere where aviation lights would not be visible. The resultant effect would be locally **moderate** (significant) near Glenbarr and **minor** (not significant) in other areas where the turbine lights would be seen, and **negligible** (not significant) elsewhere along this route.

B842, including Core Path C084 and part of NCR78

- 4.5.65 This route is a B-road which runs along the east coast of Kintyre, from Claonaig in the north down towards Campbeltown (where it is also the National Cycle Route 78), before turning west to west to Stewarton (where it is also Core Path C084) and then south to Southend (on the south coast of Kintyre). Daytime views feature a mix of more enclosed sections through woodland, with some open coastal views. West and south-west of Campbeltown there are open views across Aros Moss. South of Killellan, the road passes through the Conieglen Water valley with views focussed out to sea beyond Southend. Wind farms (including the Operational Development) can be seen from parts of the route. These views would be more limited during the hours of darkness. This road is generally dark, although streetlights are present for brief sections when driving through settlements, and in the area around Campbeltown there is a concentration of light from nearby properties and Davaar lighthouse. The aviation lights of Beinn an Tuirc (Phase 3) would be visible from some sections of this road south of Stewarton, on the skyline north of Aros Moss. Generally driving this road during the hours of darkness or even low light, requires the full attention of the driver on the road ahead, given the narrow, undulating and winding nature of the road (particularly between Claonaig and Campbeltown). The sensitivity of the route is considered to be medium.

- 4.5.66 The ZTV indicates some theoretical visibility of the aviation lights from sections of the route around Peninver and between Campbeltown and Killellan. Around Peninver, 1-3 lit turbines would be theoretically visible in side views west along Glen Lussa from a short section of this route, however they are likely to be mostly screened by forest on the skyline (see VP21). To the south of Campbeltown, between one and five lit turbines would be visible, with higher numbers of aviation lights becoming visible as the road climbs up towards Killellan. They would be visible on the skyline north of Aros Moss, in main or rear views depending on the direction of travel. While some baseline artificial lighting, including existing aviation lighting from some sections, is already visible within this part of the view, the aviation lights of the Proposed Varied Development would introduce additional lights within the view. It is considered that this would result in a localised low - medium magnitude of change to a section of this road to the south of Stewarton (near VP8) with a negligible magnitude of change elsewhere, predicted to result in a localised **minor – moderate** (not significant) effect for this section, and a **negligible** (not significant) effect elsewhere.

B843 and Core Path C085

- 4.5.67 This is a short road and Core Path C085 (Stewarton to Machrihanish) connecting the settlements of Stewarton and Machrihanish, passing through the settlement of Drumlemble. During daytime, main views are generally in the direction of travel, to the east and west, but there are also open oblique and side views to the north and south, to the southern hills and towards the Kintyre uplands to the north. These views would be more limited during the hours of darkness with attention focussed on the road ahead. Some baseline lighting is present along this route, from streetlights and properties when driving through settlements, although other parts of this route are relatively dark. Some scattered light sources can be seen within the surrounding, generally dark landscape, from properties as well as Campbeltown Airport and large agricultural buildings near the airport. Existing aviation lights are visible on the skyline to the north from some sections of this route. The sensitivity of the route is considered to be low - medium.
- 4.5.68 The ZTV indicates that the aviation lights would be visible from all of this route, with 3-5 lit turbines being visible. Higher numbers of aviation lights would become visible from the western parts of this route, with all five turbines visible from the section between Dalivaddy and Machrihanish. They would be seen in side views to the north, above the skyline across Aros Moss. They would be seen in a similar part of the view as the existing aviation light of the Operational Development, which they would be replacing, and in the context of the Beinn an Tuirc (Phase 3) aviation lights from parts of this route, although they would introduce additional lights. Whilst the drivers' attention would generally be focused on the immediate area in front of the car illuminated by the headlights, the aviation lighting would be somewhat more likely to be perceptible by passengers in side views as part of the wider background. This would result in a low -medium magnitude of change. The resultant effect would be **minor - moderate** (not significant) for this route.

Kintyre Way: Carradale to Campbeltown and Section of Core Path C088

- 4.5.69 This route comprises a section of the Kintyre Way between Carradale and Campbeltown. During daytime, there are varied views of the shoreline and broadleaf woodland estate in the north. From A'Cruach to Lussa Loch, views are generally enclosed by coniferous forest plantation but some elevated and more open views are afforded through felled areas and clearings, including across Lussa Loch. During hours of darkness, views would often be out across a relatively dark landscape, often enclosed by woodland or forest plantation, particularly between A'Cruach and Lussa Loch. To the south of Lussa Loch, there may be some low-level baseline artificial lighting from nearby properties, and distant lights across Aros Moss from some open, elevated sections. From the southernmost sections, the lights of Campbeltown would be visible. Anyone walking this route during hours of darkness would be likely to carry their own light source. The aviation lights of Beinn an Tuirc (Phase 3) are visible from parts of this route. The sensitivity of the route is considered to be medium - high.
- 4.5.70 The ZTV indicates that between one and five lit turbines would be intermittently visible from this route, between A'Cruach and Ballywilline Hill, with landform and forest occasionally restricting views. They would be seen in some main, side and rear views, in close proximity. From some sections (e.g. near Lussa Loch) the lighting intensity would be reduced. However, due to their close proximity (1.5km at the closest point), they are likely to become a noticeable feature within an otherwise primarily dark landscape. However, from the wider route the presence of the Beinn an Tuirc (Phase 3) aviation lights mean that aviation lights already feature in other views. The aviation lights would

result in a medium magnitude of change within 6km, where there are clear open views towards the Proposed Varied Development, low elsewhere within 6km, and negligible beyond 6km. This would result in a locally **moderate** (significant) effect for this route within 6km, where there are clear open views towards the Proposed Varied Development, **minor** (not significant) elsewhere within 6km, and negligible beyond 6km.

Kintyre Way: Southend to Machrihanish and Section of Core Path C090

- 4.5.71 This section of the Kintyre Way runs from Southend to Machrihanish, passing through remote moorland and atop the exposed coastline where there is little shelter. During daytime, views are directed out to sea and along the coastal cliffs, and from the northernmost section, over Machrihanish Bay and north to Aros Moss and the Operational Development. During the hours of darkness, views from much of this route would be out over a dark landscape, particularly from the more remote moorland sections, while lights from properties and nearby transport routes would become visible upon the approach to the settlements of Machrihanish and Southend. Near Machrihanish, views towards Aros Moss would feature more distant lights from scattered properties. The aviation lights of the Operational Development and Beinn an Tuirc (Phase 3) would also be visible on the northern skyline. Anyone walking this route during hours of darkness would be likely to carry their own light source. The sensitivity of the route is considered to be medium - high.
- 4.5.72 The ZTV indicates that there would be some theoretical visibility of the aviation lights from the northern section of this route, from near Creag nan Cuilean to Machrihanish, where up to five lit turbines would be visible from more elevated sections. They would be seen in main views on the skyline when travelling north along this route, in the context of the Beinn an Tuirc (Phase 3) aviation lights, in a similar part of the view as the aviation light on one of the Operational Development turbines, which they would be replacing, and in the context of other lights at lower level, including the lights of Machrihanish. While they likely to be perceptible in the view, they would therefore be seen in a context where baseline artificial lighting is already present.
- 4.5.73 This would result in a locally low - medium magnitude of change between Creag nan Cuilean and Machrihanish, and negligible elsewhere where aviation lights would not be visible. The resultant effect would be locally **minor - moderate** (not significant) between Creag nan Cuilean and Machrihanish and **negligible** (not significant) elsewhere along this route.

Core Path C086

- 4.5.74 This route is a coastal path that runs along the Links of Machrihanish. During daytime there are open views along the beach, across the golf course and out to sea. The Operational Development is visible on the skyline to the north and Machrihanish settlement is visible to the south. These views are more limited during the hours of darkness, with views being focused west as the sun sets. Some baseline artificial lighting is present nearby, around the settlement of Machrihanish, Campbeltown Airport and large agricultural buildings near the airport, although the beach itself is likely to be dark at night. The aviation lights of the Operational Development and Beinn an Tuirc (Phase 3) are also visible on the northern skyline from parts of the southern section of this route. The sensitivity of the route is considered to be medium - high.
- 4.5.75 The ZTV indicates that up to five lit turbines would be visible from most of this route, with visibility reducing to the north. They would be seen on the skyline to the north and are

likely to become a noticeable feature, although they would be seen in a part of the view where existing aviation lighting is present. This would result in a medium magnitude of change. The resultant effect would be **moderate** (significant) for this route.

Core Path C089

- 4.5.76 This route is a circular coastal path where there are open, slightly elevated views in all directions over the surrounding landscape. During daytime, main views are oriented north towards the sea, open fields, some properties and the Marine Environmental Research Laboratory Building. The Operational Development is visible in the distance. During hours of darkness, views are out across a relatively dark landscape, although lights are visible to the east in the direction of Machrihanish from some parts of the route. Views are likely to be focused out west towards the sea as the sun sets. Existing aviation lights are also visible on the northern skyline from this route. The sensitivity of the route is considered to be medium - high.
- 4.5.77 The ZTV shows visibility of all five lit turbines from the majority of this route. They would be visible on the skyline across Machrihanish Bay when travelling north along this route and would be seen in the context of the aviation lights of Beinn an Tuirc (Phase 3) turbines in a similar part of the view, but would still represent a perceptible change to views in this direction and thus a low-medium magnitude of change. The resultant effect would be **moderate** (significant) for this route.

Core Paths C087, C447 & C448

- 4.5.78 These Core Paths connect the coastal Core Path C086 (Links of Machrihanish) with the B843/Core Path C085, passing the 'RAF Machrihanish' settlement, and Campbeltown Airport terminal building. During daytime there are varied views, which are generally long-range, extending across the flat bay farmland. The Operational Development is visible on the skyline to the north. As much of the route passes close to the airport buildings, large agricultural buildings and the nearby settlement, there is a relatively high degree of baseline artificial lighting. Streetlights are present along the section of the route which passes through the 'RAF Machrihanish' settlement, however other parts of this route have less baseline artificial lighting. Views out towards surrounding landscapes, particularly towards upland areas to the north, are across a relatively dark landscape, with scattered lights from buildings. The aviation light on one of the Operational Development turbines is visible from a section of the C087, and the aviation lights of Beinn an Tuirc (Phase 3) may be visible from a short section of the C448. The sensitivity of the route is considered to be low - medium given the presence of baseline lighting.
- 4.5.79 The ZTV indicates that the aviation lights would be visible from the majority of this route, with between one and five lit turbines being visible, at varying distances, with higher numbers of aviation lights being visible from the northern sections of this route. The aviation lights would occasionally be screened by buildings, such as when passing through RAF Machrihanish. From C087 and C447 they would be seen in relatively close proximity to the north, from some sections in a similar part of the view as the aviation light on one of the Operational Development turbines, which they would be replacing. From other sections they would be seen in an otherwise dark part of the view, although in the context of nearby lights along the route, with all five lit turbines often visible. For the C448 section of the route, the aviation lights would be seen in main views when travelling northward, with two to three aviation lights visible. This would represent a low - medium magnitude of change. The resultant effect would be **minor - moderate** (not significant) for this route.

Core Path C083

- 4.5.80 This core path runs from the B842 in Campbeltown up the slopes of Beinn Ghuilean (to VP10) and then east to join the public road, Kintyre Way and Core Path C081. During daytime there are elevated main views to the north over the settlement of Campbeltown, and east over Campbeltown Loch towards Island Davaar. The Operational Development is visible from some sections of the route. During the hours of darkness, the lights of Campbeltown are visible in main views. Beyond this, more scattered lights from smaller settlements and individual properties can be seen within Aros Moss, as well as distant lights from cars along the A83 and B843 roads which traverse Aros Moss. The sections leaving/heading into Campbeltown are relatively well lit, while in the vicinity of VP10 the immediate surroundings are relatively dark, with views contained by surrounding forest. Therefore, anyone walking this route during hours of darkness would be likely to carry their own light source. The aviation lights of the Operational Development, Beinn an Tuirc (Phase 3) and Blary Hill are perceptible on the skyline to the north. The sensitivity of the route is considered to be low - medium.
- 4.5.81 The ZTV indicates that the aviation lights would be visible from much of this route, with between one and five visible. However, from some parts of this route, the aviation lights are likely to be screened by surrounding forest. Around VP10, all five lit turbines would be visible on the skyline in views north, at a relatively high intensity. While they would be experienced in the context of a relatively high degree of baseline artificial lighting around Campbeltown and Aros Moss, they would be seen within the context of the less developed upland interior beyond these more settled landscapes. Although existing aviation lighting is present within this context, the aviation lights of the Proposed Varied Development would introduce additional lighting, forming a perceptible feature within these views. This would represent a low magnitude of change. The resultant effect would be **minor** (not significant) for this route.

Core Path C091

- 4.5.82 This is a core path which forms a circular route which comes off from the Kintyre Way along the coast to the south of Machrihanish. During daytime, views are directed out to sea, and along the coastal cliffs, with existing wind development, including the Operational Development, visible from the southern section of this route. At nighttime, views are generally across a dark landscape and would be focused out west to the sea as the sun sets and light fades in other directions. Views from some sections are enclosed by landform. Baseline artificial lighting would be limited to distant lights from properties to the north-east. Existing aviation lights are also visible on the northern skyline from some sections of this route. Anyone walking this route during hours of darkness would be likely to carry their own light source. The sensitivity of the route is considered to be medium - high.
- 4.5.83 The ZTV indicates that up to five lit turbines would be visible from some of the southern and western sections of this route, seen above the skyline, in the context of the aviation lights of Beinn an Tuirc (Phase 3) turbines in a similar part of the view. While they may form a perceptible ranging to noticeable feature in this part of the view, dark skies are likely to be experienced in other directions. It is therefore considered that this would represent a low - medium magnitude of change. The resultant effect would be **minor - moderate** (not significant) for this route.

Table 6: Visible Aviation Lighting Effects on Visual Receptors Summary

	Not Significant			Significant		
	Negligible	Minor	Minor - Moderate	Moderate	Moderate - Major	Major
Viewpoints						
VP1 - A83 at Glenbarr Burial Ground			x			
VP2 - Glenbarr War Memorial			x			
VP5 - Gigha (South Pier)		x				
VP6 - Machrihanish (Little Scone)			x			
VP8 - Southend Road			x			
VP9 - Campbeltown (Ralston Road)		x				
VP10 - Beinn Ghuilean;			x			
VP12 - Bord a Dubh (Kintyre Way);				x		
VP16 – Kilbrannan;		x				
VP17 – Breakachy;					x	
VP18 - Skeroblingarry (Kintyre Way)		x				
VP19 – Drumlemble			x			
VP21 - B842 North of Peninver	x					
VP23 - Beinn Bharrain	x					
VP24 - Sea near Machrihanish				x		
VP27 - Machrihanish Dunes				x		
Residential Receptors						
R3 – Drumlemble			x			
R4 – Glenbarr			x			
R5 – Kilchenzie		x				
R7 – Machrihanish			x			
R9 – RAF Machrihanish			x			
R10 – Stewarton			x			
R11 - Tangy Village and other properties to the east of the A83					x	

	Not Significant			Significant		
	Negligible	Minor	Minor - Moderate	Moderate	Moderate - Major	Major
Routes						
A83, including Core Path C304	x	L		L		
B842, including Core Path C084 and part of NCR78	x		L			
B843 and Core Path C085			x			
Kintyre Way: Carradale to Campbeltown and Section of Core Path C088	x	L		L		
Kintyre Way: Southend to Machrihanish and Section of Core Path C090	x		L			
Core Path C086				x		
Core Path C089				x		
Core Paths C087, C447 & C448			x			
Core Path C083		x				
Core Path C091			x			

Note: L denotes an effect which would be localised only.

5. Conclusion

- 5.1.1 While the aviation lights would be theoretically visible from large parts of the Study Area, the majority of landscape and visual receptors are located over 5km away, meaning that they would only ever perceive the aviation lighting at lower levels of intensity. The aviation lights would generally represent a small but perceptible change within the wider landscape and views, often experienced in the context of other baseline lighting including existing aviation lighting from other wind farms in the area. Given the rural nature of the Study Area, there are relatively few places outside of the settlements and routes, where receptors would regularly be present to experience the effects of the aviation lights.
- 5.1.2 As summarised in **Tables 5** and **6** above, significant effects (i.e. moderate or above) were identified for one LCT, and for localised parts of two LCTs and two Designated Areas. Significant effects were also identified for four viewpoints, one residential group and two routes, and to localised sections of two routes included in the assessment of visible aviation lighting. These effects would largely be due to the proximity of these receptors to the Proposed Varied Development, open views towards the Site and the limited presence of other artificial light within the surrounding area.