

### Killean Wind Farm

Technical Appendix 5.8

Assessment of the Effects of the Proposed Development on the Special Landscape Qualities of the North Arran National Scenic Area

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# Assessment of the Effects of the Proposed Development on the Special Landscape Qualities of the North Arran NSA

#### 1.1 Introduction

- 1.1.1 This technical appendix to the Landscape and Visual Impact Assessment (LVIA) Chapter presents an assessment of the effects on the Special Landscape Qualities (AESLQ) of the North Arran National Scenic Area (NSA).
- 1.1.2 The boundary of the North Arran NSA is situated approximately 11.7 km from the nearest turbine (T2) to the east of the Proposed Development as illustrated on figures **5.9** and **5.10**. It extends to cover a broad area across the northern part of Arran. It includes mountainous areas within its heart, coastal areas and extends across parts of Kilbrannan Sound and the Sound of Bute at its outer edges.
- 1.1.3 NatureScot is preparing assessment methodology for the assessment of effects on Special Landscape Qualities (SLQ), although it is understood that the final version (expected Spring 2024) is not expected to differ significantly from the draft version. As such this assessment has been carried out following the process set out in the draft assessment methodology.
- 1.1.4 The draft assessment methodology notes that SLQs are "perceptual qualities and are about the way people respond to place." They were defined in 2007/2008 and published in 2010.
- 1.1.5 The draft assessment methodology follows a four-step approach:
  - Step 1 The Proposal a summary of the project description;
  - Step 2 Define the Study Area and Scope of the Assessment identifying the area likely to be affected;
  - Step 3 Analysis of Impacts and Effects on SLQs; and
  - Step 4 Summary of Impacts on the SLQs, implications for the North Arran NSA and possible future effects on SLQs and recommendations for mitigation.

1.1.6 The draft assessment methodology also suggests the use of a tabular approach for the assessment to aid transparency.

#### 1.2 The Special Qualities of the North Arran NSA

- 1.2.1 SNH (now NatureScot) Commissioned Report No. 374 "The special qualities of the National Scenic Areas" defined the SLQs of the North Arran NSA as follows:
  - A mountain presence that dominates the Firth of Clyde;
  - The contrast between the wild highland interior and the populated coastal strip;
  - The historical landscape in miniature;
  - A dramatic, compact mountain area;
  - A distinctive coastline with a rich variety of forms;
  - One of the most important geological areas in Britain;
  - An exceptional area for outdoor recreation; and
  - The experience of highland and island wildlife at close hand.

## 2 Step 1 - The Proposal

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A detailed description of the Proposed Development is set out in EIAR Chapter 2: Proposed Development Description.

The Proposed Development would comprise the following visible features which may have an impact on the North Arran NSA SLQs:

- up to 9 three-bladed horizontal axis wind turbines of up to 180 m tip height. Turbines would be be painted an off-white colour with a low reflectivity semi-matt finish;
- at each wind turbine, associated low to medium voltage transformers and related switchgear;
- permanent wind turbine foundations;
- hardstand areas for erection cranes at each wind turbine location;
- a network of on-site tracks including an access track, site entrance from the public road network, watercourse crossings, passing places and turning heads;
- up to four borrow pit search areas (dependent on availability of stone within the site);
- a substation compound containing electrical infrastructure, control building, welfare facilities and a communications mast;
- a network of buried electrical and communication cables to be routed alongside the access tracks;
- 'keyhole' felling and replanting of forestry;
- temporary construction compound(s);
- signage; and
- habitat management and biodiversity enhancement (see EIAR Chapter 7: Ecology Assessment for details).

The Proposed Development would require the removal of a small amount of moorland vegetation and forestry woodland to make way for the construction of the proposed turbines and the above associated infrastructure.

The main elements of the Proposed Development that have the potential to influence the SLQs are the nine wind turbines, four of which are proposed to be fitted with visible aviation lighting (T3, T6, T8, T9, with no intermediate tower lighting). Although not a defined SLQ, the visible aviation lights have the potential to effect the perception of dark skies from the NSA and thus influence the perception of the NSA's SLQs during dusk and the hours of darkness.

The associated infrastructure would have very limited potential to influence the SLQs due to these elements being at either ground-level or low in height compared to the proposed turbines and the distance from the NSA. As such it is considered that it is the proposed turbines that would have the greater potential to influence the perception of the NSA's SLQs.

## 3 Step 2 -The Study Area and Scope of the Assessment

#### The Proposed Development's location relative to North Arran NSA

- The Proposed Development is located approximately 11.7 km to the west of the NSA (based on the distance between T2 and the boundary of the NSA at a point in Kilbrannan Sound) and approximately 13.3 km from the nearest point on the west coast of Arran at Whitefarland Point;
- Wild Land Area 03 North Arran is located approximately 14.6 km to the east of the nearest turbine (T2);
- North Arran LLA is located approximately 13.3 km to the east of the nearest turbine (T2); and
- Arran Coastal Way is also located approximately 13.3 km to the east of the nearest turbine (T2).

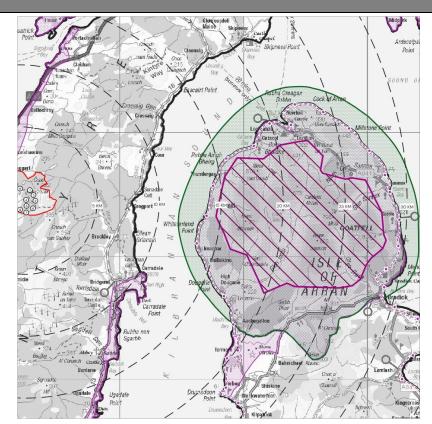


Image 1 - The Proposed Development location relative to North Arran NSA

#### Theoretical Visibility of the Proposed Development from the NSA

- Referring to Figure 5.3 illustrating the blade tip ZTV to 35 km (extract provided at Image 2), theoretical visibility extends around western coastline of Arran from the Cock of Arran in the north to Machrie Bay in the south west;
- Theoretical visibility extends inland and is confined to areas comprising:
  - high ground at Torr Meadhonach to the north east and Doire Buidhe to the south west of Lochranza;
  - the western coastline from Catacol in the north to Imachar Point in the west to Machrie Bay in the south west (represented by Viewpoint 17);
  - the west-facing slopes to the east of Pirnmill at Meall nan Damh and Beinn Bharrain that form part of the western hills of Arran (represented by viewpoints 10 and 16);
  - the high valley sides to the north west and south east of Glen Lorsa to the north east of Machrie Bay;
  - there is some very limited patchy theoretical visibility from isolated elevated areas further east within the vicinity of Goat Fell.

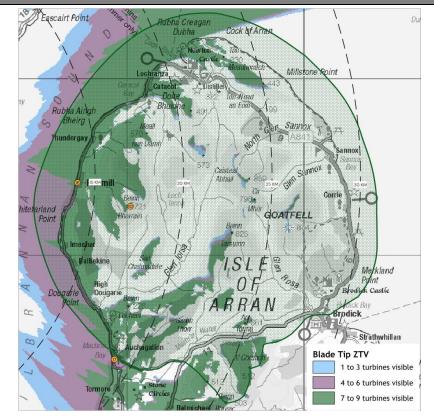


Image 2 - Theoretical blade tip visibility from the NSA

 Referring to Figure 5.5 illustrating the hub height ZTV to 35 km (extract provided at Image 3), views of a limited number of hubs are available from the lower west-facing slopes and from the western coast, with views of all turbine hubs available from more elevated locations;

#### **Relevant Studies**

• SNH (now NatureScot) Commissioned Report No. 374 "The special qualities of the National Scenic Areas"

- Referring to Figure 5.7 illustrating the lit turbine ZTV to 20 km (extract provided at Image 4), theoretical visibility of the turbines proposed to be fitted with visible aviation lighting occurs in the same geographical area but with fewer hubs visible due to the reduced number of turbines proposed to be fitted with visible aviation lights (four turbines are proposed to be fitted with visible aviation lighting;
- Referring to Figure 5.8 illustrating the intensity of the lit turbines, while
  the light would be perceived at a lower intensity from lower elevations
  around the western coast, from higher elevations receptors would also
  experience the lights at a reduced intensity due to the distance of these
  areas from the Proposed Development; and
- Further detail about the production of the lit turbine ZTVs is included in **Technical Appendix 5.7**. It should be noted that when light travels from its source it diminishes in intensity, limiting the area that its source can illuminate, a process known as 'light attenuation' or 'fall-off'. Therefore, whilst the turbine lighting intensity ZTV at **Figure 5.8** provides an indication of the reduction in intensity of the visible aviation lights due to the differences in elevation between the aviation lights and a point on the ground, it is not able to account for 'light attenuation' or 'fall-off'. Therefore, the lit turbine ZTV should be considered a worst-case extent of theoretical visibility and not an indication of the extent of effects.

https://www.nature.scot/sites/default/files/2017-07/Publication 2010 - SNH Commissioned Report 374 - The Special Qualities of the National Scenic Areas.pdf;

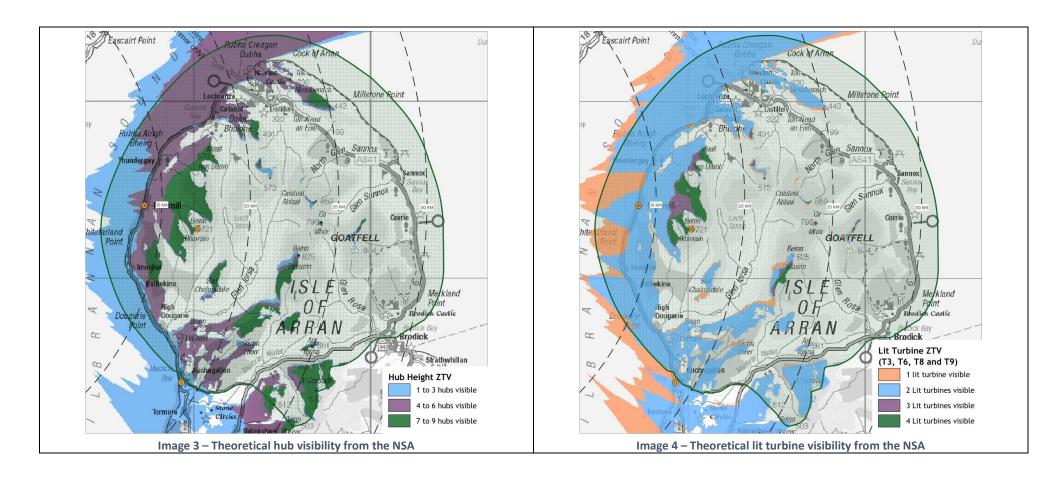
• North Ayrshire Landscape Wind Capacity Study (not available online); NatureScot National Landscape Character Types (2019) https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

#### Study Area

- With reference to **Figure 5.3**, the full extent of the NSA is covered within a 30 km radius of the Proposed Development;
- Therefore, the Study Area for this AESLQ is defined as a 30 km radius from the Proposed Development;
- This extent also includes the intervening Kilbrannan Sound with which the NSA has a strong relationship due to the contrast between its upland interior, the coastal edge and the water.

#### **Assessment Scope**

- Any effects would be indirect and focussed on those SLQs which are more strongly expressed within the western part of the NSA;
- Therefore, the SLQs considered in this AESLQ are:
  - o A distinctive coastline with a rich variety of forms
  - $\circ$  An exceptional area for outdoor recreation.



#### How is the North Arran NSA used and experienced by people?

The North Arran National Scenic Area (NSA) is used and experienced by people in various ways from visitors, to people who live and work within its boundary.

There is a scattered pattern of settlement mainly found dotted parts of the low-lying coastal areas and within occasional glens, such as Gleann an t-Suidhe within the southern part of the NSA. Occasional larger settlements are interspersed along the coastline including Lochranza in the north and Brodick at the south eastern edge of the NSA, linked by the A841 that circles the island. These settlements also have ferry terminals that connect to the mainland, providing key access points for travellers.

The NSA provides an exceptional area for active outdoor recreation attracting walkers, hikers and climbers drawn to the dramatic North Arran mountains, particularly Goatfell, which is a classic hill walk offering panoramic views across the Firth of Clyde as well as other recreational activities including golf and water-based activities within its surrounding waters. The NSA also provides an area for more passive recreation activities such as observing wildlife such as eagles, hen harriers, deer on the moors as well as spotting wildlife around its shores and within its coastal waters.

The NSA provides a popular tourist and visitor destination allowing cultural and historical exploration with different periods of historic land use evident from stone circles and chambered cairns to ruined houses and field systems. Visitors can also explore the designed landscape of Brodick Castle and gardens, as well as other historical sites such as Lochranza Castle. The area's rich cultural heritage attracts painters, poets, writers, and those interested in Scottish history.

From within the NSA, it provides opportunities for dramatic and panoramic views to landscapes beyond, while also providing a striking focal point that draws the eye towards it from areas beyond its boundaries across the Firth of Clyde, the North Ayrshire Coast and the Kintyre peninsula.

Appreciation of the SLQs would be reduced during dark sky hours. There are no defined dark sky parks, or dark sky discovery sites located within the NSA. Most people would experience dark sky views from the lower-lying, more settled coastal areas rather than the remote upland interior which would be difficult to access during the hours of darkness. From such areas the presence of occasional light sources both along the settled coast within the NSA and along the east Kintyre coast across Kilbrannan Sound would be visible. The dark form of the Kintyre peninsula would be visible in views from the NSA and similarly the mountainous outline of Arran would be seen across the Firth of Clyde and across Kilbrannan Sound from the Kintyre peninsula.

## 4 Step 3 - Analysis of Impacts and Effects on SLQs

Relevant SLQ	Key Landscape Characteristics that underpin the SLQ	Effects of the Proposed Development on the key landscape characteristics	Proposed Mitigation and Level of Residual Effect
A distinctive coastline with a rich variety of forms  "Geology, glacial and coastal processes have created a coastline of constant change in terms of shape, form, texture and colour - cliffs, rocky shores, shingle and sandy beaches.  Ancient beaches raised above the surrounding sea abound, with relic cliffs, stacks and caves on their inland edge. In many places, the old cliffs have become colonised by scrub of ivy and birch.  Roads often follow the raised beach above the modern shore, enabling both the detail of the coastline and distant views over the sea to be enjoyed."	<ul> <li>Raised Beach Coast and Cliffs</li> <li>Raised beach, visible as a level shelf backed by a steep, sometimes craggy escarpment representing the former cliff line, above which lies more gently rising land.</li> <li>Rocky coastline, sometimes with cliffs, with narrow sand and shingle beaches, and mud flats in estuarine location;</li> <li>Varied land uses but mainly farmed; the raised beaches also provide a level terrace for settlement and communication;</li> <li>Large parts of the former cliff line are also characterised by dense, often wind sheared broadleaf woodland;</li> <li>A number of hillforts, promontory forts, mottes and castles reflecting the strategic importance of this coastal landscape;</li> <li>Small, historic settlements sit comfortably against the steep former cliff line and use building</li> </ul>	The Proposed Development would not result in any effects to the 'distinctive coastline' or its 'rich variety of forms' which would still be strongly expressed and clearly perceived.  The indirect effects of the Proposed Development on this SLQ would be focussed on the "distant views over the sea" that tend to be long-range and focussed out to sea with the Kintyre peninsula the focus of views west from coastal areas.  With reference to the blade tip ZTVs at figures 5.3 and 5.4, theoretical visibility of up to all nine turbines is predicted to extend from the north of Arran, around the western coastline, south to Machrie Bay.  Referring to the hub height ZTVs at figures 5.5 and 5.6, theoretical visibility is predicted across this area of between four and six turbine hubs.  The lit turbine ZTV at Figure 5.7 indicates that up to two lit turbines would be visible. The turbine lighting intensity ZTV at Figure 5.8 indicates that, although visible, the intensity of	Overall, during daylight hours the Proposed Development would result in a low magnitude change and a minor moderate non-significant effect to the "distant views over the sea" component of this SLQ.  During the hours of darkness the Proposed Development would result in a very low magnitude change and a minor non-significant effect to the "distant views over the sea" component of this SLQ.

Relevant SLQ	Key Landscape Characteristics that underpin the SLQ	Effects of the Proposed Development on the key landscape characteristics	Proposed Mitigation and Level of Residual Effect
	<ul> <li>materials which reflect the local geology;</li> <li>Some modern growth has taken the form of ribbon development and includes caravan parks and holiday development; tall structures such as masts are relatively few;</li> <li>Landscape of visual drama and contrast with a strong sense of seclusion, and where less accessible a strong sense of remoteness; and</li> <li>Views tend to be longer distance and focussed seaward.</li> </ul>	the lights would be greatly reduced due to the difference in elevation between the turbine lights and the much of the western coastal areas where this SLQ is strongly expressed. The Proposed Development would be seen on the Kintyre peninsula in distant views over Kilbrannan Sound at distances ranging from 13.6 km to over 20 km distance. The Proposed Development would be seen in the context of large-scale commercial forestry and other operational wind farms comprising Deucheran Hill and Cour and the consented High	
	This is a narrow landscape where the cliffs and headlands can appear higher than they are. This emphasised vertical scale creates a sense of visual drama. Well-settled sections of the coast contrast with secluded and dramatic sections of headlands and cliffs. The rocky, rugged coastline and semi-natural vegetation reinforce the sense of naturalness. This is a highly visible landscape around the coastal edge, with the coastal headlands (e.g. the Heads of Ayr) forming highly visible prominent landmark features in views along the coast and from the sea. The abrupt upper edge of the	The Proposed Development's location towards the western edge of the Kintyre peninsula, further from the NSA than Deucheran Hill, Cour and High Constellation, means that despite their taller height, the proposed turbines would appear similar in scale to those of High Constellation once built, in views from the northern part of the coastline near Lochranza. The proposed turbines would appear in the same part of the view as the Deucheran Hill turbines and would maintain visual separation with the Cour turbines.	

Relevant SLQ	Key Landscape Characteristics that underpin the SLQ	Effects of the Proposed Development on the key landscape characteristics	Proposed Mitigation and Level of Residual Effect
	raised beach creates a very prominent skyline when viewed from much of the coastal road. Views tend to be long distance and focused out to sea and the landmark islands of Arran and Ailsa Craig often form the focus of the view. From Arran, views back towards the mainland, islands and peninsulas around the Firth of Clyde form the focus of views.	In views experienced from the north western part of the coastline near Rubha Airigh Bheirg, the proposed turbines would appear smaller and less prominent than the operational Cour turbines that are located closer to the NSA.  In views from the west at Pirnmill (Viewpoint 16), the turbines would be set beyond and appear smaller in scale than the operational Deucheran Hill turbines.  In views from the south western part of the western coastline at Viewpoint 17, the turbines would be largely screened by the landform of the Kintyre peninsula with only a limited	
		number of turbine blades and hubs experienced at distances in excess of 18 km.  During the hours of darkness, there	
		are few other light sources present in views across Kilbrannan Sound with only very occasional lights on the Kintyre peninsula visible. The Proposed Development would	
		introduce a change to dark sky views west across Kilbrannan Sound but due to the distance from this part of the coast together with a limited number	

Relevant SLQ	Key Landscape Characteristics that underpin the SLQ	Effects of the Proposed Development on the key landscape characteristics	Proposed Mitigation and Level of Residual Effect
		of lit turbines being visible, effects would be limited.	
An exceptional area for outdoor recreation  "Reflecting its accessibility and its dramatic scenery, the island has long been popular with visitors. Over the years it has attracted painters, poets and writers as well as the day-tripper and walker.  The ascent of Goatfell from Brodick is a classic hill walk, providing spectacular panoramic views of the Firth of Clyde, while a visit to Brodick Castle and its beautiful gardens provides a less strenuous alternative.  North Arran provides an 'island adventure' for people throughout southern Scotland."	<ul> <li>LCT 83 Rugged Upland Ayrshire</li> <li>Dramatic, craggy, mountainous scenery;</li> <li>Scarce signs of human influence, limited to tracks and walkers' footpaths with roads running around the fringes; and</li> <li>Grand, large scale, remote landscape with wild character, from the summits there are dramatic and extensive views in all directions.</li> <li>The north Arran Mountains are among the most spectacular mountains in Scotland, providing a remarkable skyline when viewed from the mainland, from Kintyre, or from vessels travelling through the Firth of Clyde. They are widely appreciated and visited, partly reflecting their proximity to centres of population on the mainland. They are popular for walking and cycling and provide respite from nearby more developed landscapes.</li> <li>The eastern peaks are much more rugged than those to the west and are</li> </ul>	With reference to the blade tip ZTVs at figures 5.3 and 5.4, theoretical visibility of up to all nine turbines is predicted to extend from the north of Arran, around the western coastline, south to Machrie Bay and across the west-facing hills to the east of Pirnmill. There would also be very limited theoretical visibility from high peaks further east, including Goatfell with is vantage point located over 26 km to the east of the Proposed Development.  Referring to the hub height ZTVs at figures 5.5 and 5.6, theoretical visibility is predicted across parts of this area of between four and six turbine hubs, while at some elevated peaks potentially all turbine hubs would be visible but experienced at considerable distance. At Goatfell between one and three turbine hubs would be visible in theory.  The lit turbine ZTV at Figure 5.7 indicates that up to two lit turbines would be visible across much of the western hills, with only the most elevated high points where up to all four lit turbines would be visible.	Overall, during daylight hours the Proposed Development would result in no greater than a low magnitude change and a minor moderate nonsignificant effect to this SLQ.  During the hours of darkness the Proposed Development would result in a very low magnitude change and a minor non-significant effect to this SLQ.

Relevant SLQ	Key Landscape Characteristics that underpin the SLQ	Effects of the Proposed Development on the key landscape characteristics	Proposed Mitigation and Level of Residual Effect
	popular as a hill walking and mountaineering destination.  These mountains provide challenging terrain relatively close to Brodick and thousands of walkers follow the constructed footpaths to ascend Goat Fell each year.  There is a sharp contrast between the rugged eastern mountains, including Goat Fell, Caisteal Abhail and Beinn Tarsuinn and the more rounded moorland hills of Beinn Bharrain, Mullach Buide, Beinn Bhreac and Beinn Tarsuinn, which lie to the west of Glen Iorsa.  The eastern peaks form a cluster of very rugged mountains, linked by a heavily serrated and sometimes knifeedge ridge.  Although not as high as peaks in other WLAs, their elevation and steepness seem exaggerated by their proximity to the sea.  The combination of steep slopes, crags, cliffs, scree and boulder fields makes access to these peaks physically challenging and exposed bealachs and ridges provide a strong sense of awe and high risk.	Due to elevation of the hills compared to the lit turbines, the reduction in turbine lighting intensity, illustrated at Figure 5.8, would be less and in some locations there would be no reduction. However, such areas are located over 15 km from the Proposed Development and as such the intensity of the lights would be reduced in any case due to the distance between these locations and the turbine lights through 'light fall-off'.  With reference to the blade tip ZTV at Figure 5.3 there would be no visibility experienced by people visiting Brodick Castle or its gardens.  People accessing Goatfell would only experience very long range views (in excess of 26 km) at its summit.  People accessing the less frequented western hills around Beinn Bhreac, Beinn Bhararain and Mullach Buidhe would experience a greater degree of visual change due to the closer proximity of these western hills to the Proposed Development. However, views would still be experienced at distances in excess of approximately 15 km.  During daylight hours, the Proposed Development would introduce	

Relevant SLQ	Key Landscape Characteristics that underpin the SLQ	Effects of the Proposed Development on the key landscape characteristics	Proposed Mitigation and Level of Residual Effect
	By contrast, the hills to the west are less accessible and more rounded. They tend to be less popular with walkers or climbers seeking the challenge of the eastern mountains and consequently provide a greater sense of remoteness and isolation. These qualities combine with the proximity to Brodick and the main ferry services to make Goat Fell and adjacent peaks very popular with walkers and climbers.  (extracts from WLA 03 Description)	additional structures into a part of the landscape that is already influenced by the existing operational wind farms on the Kintyre peninsula comprising Cour, Deucheran and the Beinn an Tuirc schemes.  However, the 'sense of remoteness and isolation' would remain due to the considerable separation distance between these hills and the Proposed Development with this separation further reinforced by Kilbrannan Sound.  During the hours of darkness, there are few other light sources present in views across Kilbrannan Sound with only very occasional lights on the Kintyre peninsula visible. The Proposed Development would introduce a change to dark sky views west towards the Kintyre peninsula but due to the distance from the hills together with a limited number of lit turbines being visible, effects would be limited.	

## Summary of the Effects of the Proposed Development on the SLQs and the Integrity of North Arran NSA

Overall, it is not considered that there would be any significant effects on the relevant SLQs of the North Arran NSA considered in this AESLQ. There would be some limited non-significant effects on the "A distinctive coastline with a rich variety of forms" and the "An exceptional area for outdoor recreation" SLQs. The Proposed Development would be experienced in views mainly obtained from the coastline extending around the western edge of the NSA and from the more elevated hills and west-facing slopes to the east of Pirnmill.

The change would be mainly experienced at distances in excess of 13.6 km, although it is acknowledged that boaters within the coastal waters around the western edge of the NSA would potentially experience closer-range views. The change would occur in a part of the Kintyre peninsula that has already been modified by commercial forestry and the introduction of other wind farms, which are located further eastwards on the Kintyre peninsula than the Proposed Development which is set towards the western edge of the upland hills.

With reference to the blade tip ZTV at **Figure 5.3**, theoretical visibility is concentrated around the western edges of the NSA and from the north western and western hills. The majority of the NSA further east would not experience any visibility, with only very limited visibility from the most elevated locations which are located at distances in excess of 20 km to the east.

The SLQs do not make reference to dark sky views. However, such views would be experienced by people in the NSA during the hours of darkness, mainly from lower-lying coastal areas due to the difficulty of accessing the hills during the hours of darkness. In many locations, the limited number of turbine lights together with the reduction in intensity in many locations due to the difference in elevation between the turbine lights and the western parts of the NSA and the considerable intervening distance would mean that effects during the hours of the darkness would be limited.

Given the distance between the Proposed Development and the NSA, the location of the Proposed Development in a part of the Kintyre peninsula where other wind farms are already located, it is not considered that the Proposed Development would result in any significant effects to the NSA SLQs. Overall, it is not considered that the effects that would occur to the two relevant SLQs would be of such a scale as to undermine the overall integrity of the NSA and the reasons for its designation.