



Technical Appendix 5.6

Cumulative Context

Table of contents

5.1	Introduction	3
5.2	Preliminary Assessment	4
5.2.1	Overview	4
5.2.2	Windfarms within the North of the Study Area	4
5.2.3	Windfarms within the South East and East of the Study Area	4
5.2.4	Windfarms within the West and North West of the Study Area	4
5.3	Summary	5

List of Figures

Cumulative ZTVs	
Figure 5.6.1	All Operational Sites
Figure 5.6.2	All Operational and Consented Sites
Figure 5.6.3	All Application Sites
Figure 5.6.4	South East Operational & Consented Group
Figure 5.6.5	North Operational & Consented Group
Figure 5.6.6	West Operational & Consented Group
Figure 5.6.7	North West Operational & Consented Group
Figure 5.6.8	Little Hart Fell
Figure 5.6.9	Faw Side
Figure 5.6.10	West Application Group
Figure 5.6.11	North West Application Group



5 Cumulative Context

5.1 Introduction

1. This appendix provides an overview and preliminary assessment of the operational, consented and application windfarms within the Study Area, providing the context for the focussed cumulative baseline within **Chapter 5: Landscape and Visual Impact Assessment (LVIA)**.
2. The Proposed Development would form an extension to the operational Harestanes Windfarm, which is also directly adjacent to Minnygap Windfarm. Dalswinton Windfarm is approximately 6km to the south west. These three existing windfarms, as operational, are considered as part of the baseline. They have the most potential to be seen with the Proposed Development and the potential effects are addressed in **Chapter 5: LVIA**.
3. A map (**EIA Report Figure 5.7 Cumulative Sites 45km Study Area**) of cumulative wind turbine developments was produced for the 45km Study Area so that a full understanding of the pattern of windfarm development in the landscape could be gained prior to focussing the assessment. This map includes all operational, consented, application, and scoping windfarm developments as of 18 August 2020.
4. Through an initial study of the pattern of windfarm development, taking into account the combination of topography across the Study Area and visibility of the Proposed Development it was considered that the probability of significant cumulative effects between the Proposed Development in addition to any cumulative windfarm developments beyond approximately 30km of the Proposed Development would be very unlikely. Therefore, all cumulative windfarm developments that lie substantially beyond 30km were excluded from the cumulative assessment and have not been considered further. Cumulative windfarm developments within or just beyond the 30km Study Area are shown on **EIA Report Figure 5.8 Cumulative Sites 30km Study Area**, listed below in **Table 5.6.1**, and are discussed further in this appendix.
5. Scoping stage windfarm developments within the Study Area have been shown on **EIA Report Figure 5.7 Cumulative Sites 45km Study Area** for reference but have not been considered further due to design uncertainty at the pre-application stage and the possibility that only some or none of these pre applications would progress onto full applications. There are no scoping sites within 20km of the Proposed Development.

Windfarm development	No. of turbines	Blade Tip Height (m)	Approx. Distance from the Proposed Development (km)	Local Authority	Status: O= Operational; C = Consented; A = Application
Windfarms within 10km of Proposed Development					
Harestanes	68	125.0	0	Dumfries and Galloway Council	O
Minnygap	10	125.0	4		O
Dalswinton	15	120.0	6		O
Windfarms in South East of Study Area					
Minsca	16	122.5	21	Dumfries and Galloway Council	O
Ewe Hill and Extension	22	110.0	24		O
Hopsrigs	12	140.0	23		C

Windfarm development	No. of turbines	Blade Tip Height (m)	Approx. Distance from the Proposed Development (km)	Local Authority	Status: O= Operational; C = Consented; A = Application
Crossdykes	10	176.5	22		C
Solwaybank	15	126.5	28		C
Little Hart Fell	9	160.0	18		C
Loganhead (Resubmission)*	8	179.9	27		C + A
Faw Side	45	200.0	28		A
Windfarms in North of Study Area					
Clyde	148	125	23	South Lanarkshire Council	O
Clyde Extension	54	125.5/144.0	27		O
Crookedstane	4	126.5	21		O
Lion Hill	4	126.5	18		C
Glenkerie	11	80.0	30		C
Glenkerie Extension	6	100.0	31		C
Whitelaw Brae	14	136.5	25		C
Windfarms in West of Study Area					
Blackcraig	23	110.0	29	Dumfries and Galloway Council	O
Wether Hill	14	91.0	30		O
Mochrum Fell	7	149.9	31		C
Knockman Hill	5	81.0	34		C
Glenshimmeroch (Resubmission)*	10	160.0/180.0	34		C + A
Trostan Loch	14	149.9	29		A
Fell	9	200.0	26		A
Cornharrow	8	149.9	31		A
Windfarms in North West of Study Area					
Sanquhar	9	130.0	30	Dumfries and Galloway Council	O
Hare Hill	20	64.0	34		O
Hare Hill Extension	35	91.0	34		O
Whiteside Hill	11	120.0	29		O
Sunnyside Farm	2	101.0	28		O
Sanquhar Six Community	6	130.0	33		C
Twentysilling Hill (Resubmission)*	9	140.0	24		C + A

Windfarm development	No. of turbines	Blade Tip Height (m)	Approx. Distance from the Proposed Development (km)	Local Authority	Status: O= Operational; C = Consented; A = Application
Euchanhead	20	225.0	33		A
Sanquhar II	44	200.0	28		A
Sandy Knowe (Resubmission)*	24	125.0	32		C + A
Lorg (Resubmission)*	15	130/ 149.9	35		C + A
*Where windfarms have been consented and subsequently resubmitted as an application with a variation to height, the application's larger height has been modelled into the ZTV and wirelines.					

Table 5.6.1: Cumulative Windfarm list

5.2 Preliminary Assessment

5.2.1 Overview

6. The pattern of visibility of the operational, consented and application windfarms within 30km are clearly within three general areas (in addition to the Site area): to the north within the Southern Uplands; to the west and north west within the upland Ken/Stroan area; and to the south east and east within the Langholm Hills area. All but operational Harestanes, Minnygap and Dalswinton Windfarms, and consented Lionhill and Little Hart Fell Windfarms lie beyond 20km from the Proposed Development. A preliminary assessment is presented below based on the geographical areas, considering operational (baseline), consented (future baseline) and application windfarms.
7. All windfarms within the Study Area have been modelled into the viewpoint wirelines (**Figures 5.11-5.31**) where potentially visible. Grouped and some individual cumulative ZTVs (CZTVs) (**Figures 5.6.1 – 5.6.12**) have been produced which illustrate the theoretical visibility of the operational, consented and application windfarms with the Proposed Development across the Study Area.

5.2.2 Windfarms within the North of the Study Area

5.2.2.1 Baseline and Future Baseline

8. The operational Clyde Windfarm and its extension lie beyond 23km north from the Proposed Development, and the consented Whitelaw Brae, Crookedstane, Lionhill and Glenkerie Windfarms lie in close vicinity to Clyde. There are no application windfarms in this area.
9. The Lowther Hills lie between the Proposed Development and these windfarms, so that the potential combined visibility is limited to a narrow extent to the south east of the Study Area, between Moffat and the lower Annandale area, as illustrated on **Figure 5.6.5: CZTV North Operational and Consented Group**.
10. The viewpoint assessment (**Appendix 5.2: Viewpoint Assessment**) demonstrated that the Proposed Development in views from the north and north east would be largely seen behind the operational Harestanes and Minnygap windfarms with the varying elevation of the Site area causing the proposed hub and blade heights to be seen at a similar height to the existing turbines. The Proposed Development would not be particularly distinguishable from the context of the operational turbines in these views and Low or Negligible scale of effects were assessed from viewpoints in these areas (including Viewpoint 11 near Moffat: **Visualisation Figure 5.21** and Viewpoint 15 Hart Fell: **Visualisation Figure 5.25**). On this basis, where combined visibility with operational and consented windfarms would be possible in these north eastern areas, there would be no potential for significant cumulative effects.

11. Further south, in lower Annandale where larger areas of potential combined visibility are illustrated on the CZTV, the distance increases to the northern windfarms and taking into account the treed and settled nature of much of this area there would be very limited opportunities for combined views. This is demonstrated by lack of any visibility of the northern windfarms shown on Viewpoints within Annandale (Viewpoint 9: **Visualisation Figure 5.19**, Viewpoint 16: **Visualisation Figure 5.26**, and Viewpoint 17: **Visualisation Figure 5.27**). Viewpoint 20 on Burnswick Hill (**Visualisation Figure 5.30**), an elevated viewpoint, south east of the Annandale area, near Lockerbie illustrates that the Proposed Development would have a Negligible effect, and none of the consented northern windfarms would be visible and Clyde Windfarm would be appear on the distant skyline, over 27km away.
12. It is considered that the Proposed Development in addition to a baseline with the north operational sites, and future baseline with the north consented sites would not create any significant effects on landscape or visual receptors.

5.2.3 Windfarms within the South East and East of the Study Area

5.2.3.1 Baseline and Future Baseline

13. Operational windfarms at Minsca and Ewehill lie in the area between Lockerbie and Langholm, approximately 23-25km from the Proposed Development. The consented Little Hart Fell Windfarm lies west of Ewehill, at 18km from the Proposed Development. Consented windfarms at Loganhead, Crossdykes, Hopsrig and the in-construction Solway Bank windfarm also lie in this area between 23-30km from the Proposed Development.
14. Minsca windfarm can be seen from the south east facing slopes of the Site, discernible but a small proportion of the overall wider panoramic views. Ewehill and the other consented windfarms in this area lie further within the hills and uplands and there is little potential for combined visibility with the Proposed Development except for nearby summits such as Burnswark Hill (Viewpoint 20, **Visualisation Figure 5.30**) which have 360 degree views. A negligible scale of effect was assessed for the Proposed Development at this viewpoint.
15. **Figure 5.6.4: CZTV South East Operational and Consented Group** illustrates that there would be combined visibility across middle and lower Annandale, although orientation of the windfarms from each other would mean they would only be visible in successional views from static viewpoints or sequentially. However, the nature of Annandale is that it is a low, gently rolling landscape with much tree cover which limits open and expansive views. Combined with distance between the windfarms, it is considered that the Proposed Development in addition to a baseline with the south east operational sites, and future baseline with the south east consented sites would not create any significant effects on landscape or visual receptors.

5.2.3.2 Application windfarms

16. The application Faw Side Windfarm is 29km east of the Proposed Development and lies in the uplands at the edge of the Study Area. As shown on **Figure 5.6.9: CZTV Faw Side**, the main areas of combined visibility would be largely around the Site and western edge of Annandale. Based on the upland topography around Faw Side, and lack of visibility of Faw Side shown within the wirelines for viewpoints across the Study Area, it is anticipated that many of the Faw Side turbines would not be seen or only the blade tips. In addition, these areas of visibility would be beyond 25km from Faw Side. Taking into account the treed and settled nature of Annandale, the opportunities for combined views of the Proposed Development and Faw Side would be very limited. It is considered that there would be no potential for significant cumulative effects with the Proposed Development in addition to the application Faw Side Windfarm.
17. The application for increasing the height of the consented Loganhead Windfarm is not considered to change the assessment made above. It would sit within an existing area of windfarms, in an upland landscape, 27km to the south east of the Proposed Development.

5.2.4 Windfarms within the West and North West of the Study Area

5.2.4.1 Baseline and Future Baseline

18. The operational and consented windfarms within the west and north west of the Study Area cover an area known as Ken/Stroan, and generally sit around 30km from the Proposed Development. They lie within an upland landscape that largely contains their visibility within a small proportion of the Study Area as illustrated on **Figure 5.6.6: CZTV**

West Operational and Consented Group, and **Figure 5.6.7: CZTV North West Operational and Consented Group**. Potential combined visibility is generally within a small area in lower Nithsdale, north east and south east of Dumfries. The assessment in **Chapter 5: LVIA** has shown that potential visibility of the Proposed Development from these areas around Dumfries are limited by settlement and the treed nature of the area, and where visible, the Proposed Development would appear in the context of operational Dalswinton and Harestanes Windfarms. The operational and consented windfarms in the north west and west would all be approximately 25km at closest from these main areas of visibility which would limit the potential for significant cumulative effects.

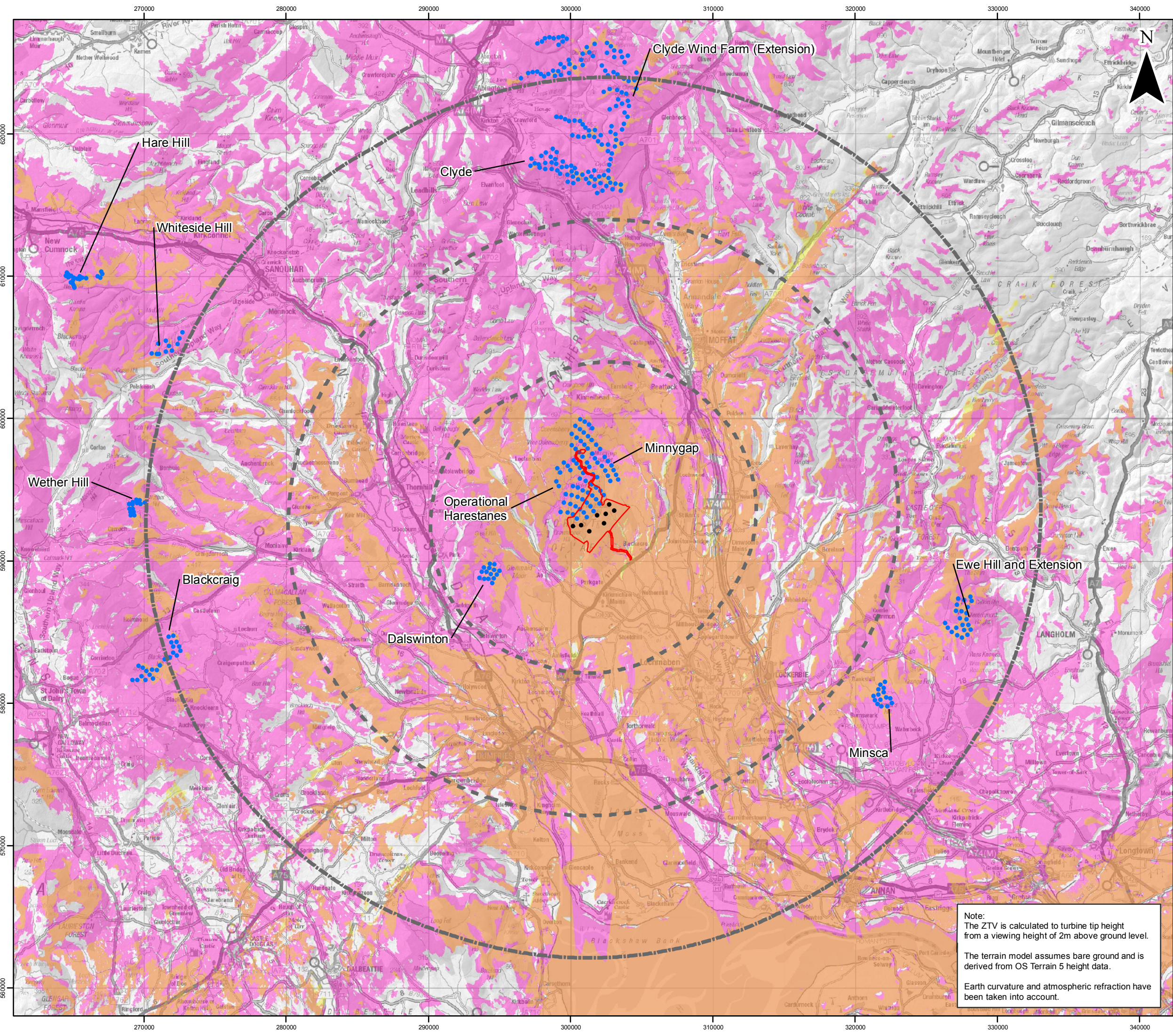
19. Sequential effects on the A76 as the main road within this area would be very limited as the Proposed Development is only potentially visible from the lower stretch near Dumfries, and would be seen obliquely, in the context of the operational windfarms, as demonstrated by the Low scale of effect assessed at Viewpoint 18: Hollywood, A76 (**Figure 5.28**). Vegetation and settlement along much of the A76 also precludes clear views out to the wider landscape.
20. It is considered that the Proposed Development in addition to a baseline with the west and north west operational sites, and future baseline with the west and north west consented sites would not create any significant cumulative effects on landscape or visual receptors.

5.2.4.2 Application windfarms

21. Application windfarms in this area include Sanquhar II, Eucharhead, Trostan Loch and Fell which as shown on wirelines from Viewpoint 6 at Rashy Heights (**Visualisation Figure 5.16**), Viewpoint 7 at Queensberry (**Visualisation Figure 5.17**), and Viewpoint 21 at Bishop Forest Hill (**Visualisation Figure 5.31**) would be visible on the skyline behind the foothills and uplands that contain Nithsdale. At all these viewpoints, the Proposed Development was assessed to have Low or Negligible effects. The application windfarms are more clearly associated with the distant upland landscape, separate to that which contains the visibility of the Proposed Development. It is considered that the Proposed Development in addition to application windfarms which lie to the west and north west would not have any potential for creating significant cumulative effects.

5.3 Summary

22. The distance and location of the windfarms (excluding operational Harestanes, Minnygap and Dalswinton) in relation to the Proposed Development within the Study Area would considerably limit the potential for significant cumulative effects on landscape or visual receptors. The upland topography would limit the intervisibility within the windfarms to the north; the windfarms to the south east and east and also those in the west and north west lie distant and clearly associated with the foothills and uplands beyond the main areas of visibility of the Proposed Development. Whilst there would be potential opportunities for visibility of the Proposed Development in addition to the operational, consented and application windfarms in successive views from static viewpoints and potentially some sequential views, as an extension windfarm, the Proposed Development would have limited effects on its own, reducing the potential for any significant cumulative effects.



Legend

Application Boundary

30km Radius Study Area

10km Buffer Bandings

Proposed Turbine Location

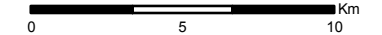
Operational Turbine

Operational Theoretical Visibility: Ewe Hill, Blackcraig, Clyde, Clyde Extension, Minsca, Minnygap, Dalswinton

Combined Theoretical Visibility

Proposed Development Theoretical Visibility

© Crown Copyright 2020. All rights reserved.
Ordnance Survey Licence 0100031673.



B	11/11/2020	BG	Second Issue.
A	10/08/2020	CW	First Issue.
Rev	Date	By	Comment



Harestanes South Windfarm Extension
Figure 5.6.1: Cumulative ZTV - All Operational Sites

Drg No

HARESTANES_WSP_I_088

Rev

B

Date

11/11/2020

Scale

1:250,000 @ A3

Note:
The ZTV is calculated to turbine tip height from a viewing height of 2m above ground level.

The terrain model assumes bare ground and is derived from OS Terrain 5 height data.

Earth curvature and atmospheric refraction have been taken into account.

