

## **Chapter 13: Summary of Significant Effects**



# Chapter 13

## Summary of Significant Effects

### Introduction

**13.1 Chapters 4 to 12** of the Environmental Impact Assessment (EIA) Report present the findings of the predicted effects of Dunside Wind Farm (hereafter referred to as the 'Proposed Development') on a topic-by-topic basis. The significance of these effects has been assessed using criteria defined in the topic chapters. Where appropriate, the significance of effects has been categorised as **Major**, **Moderate**, Minor or Negligible. In the context of the Environmental Impact Assessment under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (the 'EIA Regulations'), effects assessed as being of '**Major**' or '**Moderate**' significance are considered to be significant effects. Where this differs for certain topic chapters this has been clearly stated, and details are provided for how significant effects have been defined for that assessment.

**13.2** In line with Schedule 4 of the EIA Regulations, PAN 1/2013, and other relevant EIA guidance, the EIA Report has focused on identifying significant environmental effects (both positive and adverse) of the Proposed Development, during construction, operation and decommissioning (including cumulatively).

**13.3 Tables 13.1 to 13.4** below summarise the predicted significant effects of the Proposed Development prior to and following the implementation of committed mitigation. All effects are adverse unless otherwise stated.

### Summary of Significant Effects

**13.4** Prior to committed mitigation, significant effects are predicted in relation to the following topics:

- **Chapter 4: Landscape and Visual Impact Assessment;**
- **Chapter 5: Cultural Heritage;**
- **Chapter 10: Access, Traffic and Transport;**
- **Chapter 11: Aviation;** and
- **Chapter 12: Other Issues (Climate Change) (positive).**

**13.5** Prior to committed mitigation, significant effects are not predicted in relation to the following topics and these are therefore not discussed further in this chapter.

- **Chapter 6: Ecology;**
- **Chapter 7: Ornithology;**
- **Chapter 8: Hydrology, Hydrogeology, Geology and Peat;** and
- **Chapter 9: Noise and Vibration.**

**13.6** Following mitigation, significant residual effects are predicted for the following topics:

- **Chapter 4: Landscape and Visual Impact Assessment;**
- **Chapter 5: Cultural Heritage;** and
- **Chapter 12: Other Issues (Climate Change) (positive).**

## Landscape and Visual Amenity

**13.7** It should be noted that wind turbines, as tall man-made structures, introduce features which are likely to bring about landscape and visual changes. Measures to reduce effects upon the landscape resource and upon views and visual amenity are predominantly achieved through the design of the Proposed Development, as described in **Chapter 2: Site Selection and Design Strategy** and the supporting **Design and Access Statement**. As all mitigation for landscape and visual effects is embedded within the final design for the Proposed Development, all effects discussed in this section are effectively residual effects as no further mitigation is proposed. Potential significant effects on landscape and visual amenity are set out below and summarised in **Table 13.1**.

### Significant Landscape Effects

**13.8** Significant effects on the landscape of the Site will be experienced during the construction period. During operation, significant effects on landscape character are predicted to extend across the Site and the surrounding landscapes within approximately 7 km of the nearest turbine. There will be **Major** and significant effects on the 'host' Landscape Character Type (LCT) (LCT 90 - Dissected Plateau Moorland) within the Site, through the introduction of up to 15 turbines and ancillary infrastructure including tracks into the open moorland landscape. The effect on LCT 90 will reduce to **Moderate** and significant outside of the Site, where effects will be indirect. **Moderate** and significant effects will also extend to the adjacent LCTs 105 - Upland Fringe Moorland with Hills and 266 – Plateau Moorland – Lothians.

### Significant Visual Effects

**13.9** Significant effects have been identified at nine of the 24 representative viewpoints, up to a distance of approximately nine kilometres from the Site. Significant effects will be experienced by recreational receptors on the Southern Upland Way (Viewpoints 1, 2, 4 and 11) including at Twin Law Cairns which overlooks the Site. Significant effects will also be experienced by users of the local road network, travelling on the minor roads (Viewpoints 3 and 5) and the B6456 (Viewpoint 8). Recreational receptors at local hill summits will also experience significant effects, including Spartleton Hill (Viewpoint 6) and Darrington Great Law (Viewpoint 9). Users of Core Paths and Rights of Way within and up to a distance of approximately 5 km of the Site will also experience a significant effect. No significant effects will be experienced from settlements, including the closest settlements of Westruther and Longformacus.

### Significant Effects on Designated Landscapes

**13.10** The Proposed Development will result in direct and indirect changes to the landscape character of the Lammermuir Hills Special Landscape Area (SLA), due to the location of up to 15 turbines and associated tracks and infrastructure within the designated area. This is assessed as a **Major** and significant effect on landscape character within the Site, and a **Moderate** and significant effect on landscape character outside of the Site, up to a distance of around 7 km. Significant visual effects are also recorded within the SLA, including from locations along the Southern Upland Way and at the summit of Darrington Great Law. The Proposed Development would have a significant effect on some of the special qualities of the SLA, most notably its *"remote, wild qualities, despite its managed nature"* and *"The extent and uninterrupted openness of the landscape [which] lend scenic value"*<sup>1</sup>. However, effects on these qualities are not anticipated to affect the integrity of the designated landscape. This is due in part to the local area being affected by wind farm development at Fallago Rig.

### Cumulative Effects

**13.11** The cumulative assessment focuses on the additional cumulative change which may result from the introduction of the Proposed Development into the present or future baseline (i.e. in addition to other development which may or may not be present). The Proposed Development is located within the central part of the Lammermuir Hills which contains the operational Fallago Rig Wind Farm, such that the character of the local landscape is already influenced by this type of development. Other groups of operational and planned wind farms lie at the eastern and western ends of the Lammermuir Hills and are separate both spatially and visually.

**13.12** Scenario 1 of the cumulative assessment considers the addition of the Proposed Development to a landscape with operational, under construction and consented wind farms. Crystal Rig Phase 4 Wind Farm is the only consented wind farm

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<sup>1</sup> Scottish Borders Council (2012) Supplementary Planning Guidance: Local Landscape Designations.

within 20 km of the Proposed Development, and will form part of an existing group, resulting in minimal changes to the future baseline when considered against the existing baseline. Thus, effects in Scenario 1 are typically found to be the same as in the primary assessment.

**13.13** Scenario 2 of the cumulative assessment considers the addition of the Proposed Development to a landscape with operational, under construction, consented, undetermined valid planning applications, appeal and Scoping stage schemes (in close proximity to the Site). Cumulative landscape and visual effects are most likely to arise when the Proposed Development is considered in addition to Newlands Hill Wind Farm, which is the only proposed wind farm within 20 km of the Proposed Development. Newlands Hill is at Scoping stage and located approximately 4 km to the north of the Proposed Development. In most views the effect will remain as in the primary assessment, except where Newlands Hill is in front of the Proposed Development and they occupy the same field of view. In this scenario the additional effect of the Proposed Development is typically lessened from the primary assessment.

### Effects Relating to Aviation Lighting

**13.14** When visible, aviation lighting on the turbine nacelles would tend to be seen in closer proximity views from the minor roads which cross the Lammermuir moorland plateau to the east of the Site, or from the rolling farmland to the south, beyond forested horizons. In terms of visual effects, significant visual effects are predicted for one assessment viewpoint, under the 2,000 candela (cd) situation only. In the 200 cd situation, which is more likely to be experienced by people at this viewpoint, no significant effects are predicted.

**Table 13.1: Summary of Significant Effects Landscape and Visual Amenity**

Landscape and Visual Amenity		
Receptor	Significance of Residual Effect	Cumulative Effect
<b>Construction Effects</b>		
The Site	<b>Major (significant)</b>	n/a
<b>Operational Effects on Landscape Character</b>		
The Site	<b>Major (significant)</b>	n/a
LCT 90 - Dissected Plateau Moorland)	<b>Major (significant) (within the Site)</b> <b>Moderate (significant) (within 5 km)</b>	Scenario 1 and Scenario 2: <b>Major (significant) (within the Site)</b> <b>Moderate (significant) (within 5 km)</b>
LCT 105 - Upland Fringe Moorland with Hills	<b>Moderate (significant) (within 7 km)</b> Minor (not significant) (beyond 7 km)	Scenario 1 and Scenario 2: <b>Moderate (significant) (within 7 km)</b> Minor (not significant) (beyond 7 km)
LCT 266 – Plateau Moorland – Lothians	<b>Moderate (significant) (within 5 km)</b> Minor (not significant) (5-10 km)	Scenario 1 and Scenario 2: <b>Moderate (significant) (within 5 km)</b> Minor (not significant) (5-10 km)
<b>Operational Effects on Views and Visual Amenity</b>		
Viewpoint 1: Twin Law Cairns, Southern Upland Way	<b>Major (significant)</b>	Scenario 1 and Scenario 2: <b>Major (significant)</b>
Viewpoint 2: Nun Rig, Southern Upland Way	<b>Major (significant)</b>	Scenario 1 and Scenario 2: <b>Major (significant)</b>

Landscape and Visual Amenity		
Receptor	Significance of Residual Effect	Cumulative Effect
Viewpoint 3: Minor road near Wanside Rig junction	<b>Moderate (significant)</b>	Scenario 1: <b>Moderate (significant)</b> Scenario 2: <b>Major (significant)</b>
Viewpoint 4: Watch Water Reservoir, Southern Upland Way	<b>Moderate (significant)</b>	Scenario 1 and Scenario 2: <b>Moderate (significant)</b>
Viewpoint 5: Minor road near Wrunk Law	<b>Moderate (significant)</b>	Scenario 1 and Scenario 2: <b>Moderate (significant)</b>
Viewpoint 6: Spartleton Hill	<b>Moderate (significant)</b>	Scenario 1 and Scenario 2: <b>Moderate (significant)</b>
Viewpoint 8: B6456 near Bedshiel	<b>Moderate (significant)</b>	Scenario 1 and Scenario 2: <b>Moderate (significant)</b>
Viewpoint 9: Durrington Great Law	<b>Moderate (significant)</b>	Scenario 1 and Scenario 2: <b>Moderate (significant)</b>
Viewpoint 11: Edgarhope Wood, Southern Upland Way	<b>Moderate (significant)</b>	Scenario 1 and Scenario 2: <b>Moderate (significant)</b>
Operational Effects on Routes		
Minor road via Longformacus	<b>Moderate (significant)</b>	Scenario 1 and Scenario 2: <b>Moderate (significant)</b>
Southern Upland Way	<b>Major (significant) (within 5 km)</b>	Scenario 1 and Scenario 2: <b>Major (significant) (within 5 km)</b>
Core Paths and Rights of Way within around 5 km of the Site	<b>Major (significant)</b>	Scenario 1 and Scenario 2: <b>Major (significant)</b>

## Cultural Heritage

**13.15** Significant residual effects are predicted for the Mutiny Stones (SM361) and Byreclough Farmstead (SM4549) due to setting change resulting from the operation of the Proposed Development (**Moderate**). The evolution of the design process has sought to minimise the potential for impacts on heritage assets resulting from setting change. This has included a reduction in the number of turbines and their re-siting. However, for developments of this sort, it is difficult to fully mitigate impacts to heritage assets resulting from setting change during the operation beyond those changes to the design and layout identified as the Proposed Development evolves. Therefore, no specific additional mitigation to reduce the potential effects to heritage assets due to setting change resulting from the operation of the Proposed Development has been identified.

**13.16** Significant effects on cultural heritage are summarised in **Table 13.2**.

**Table 13.2: Summary of Significant Effects on Cultural Heritage**

Cultural Heritage			
Receptor	Significance of Effect	Mitigation	Significance of Residual Effect

Operational Effects			
Mutiny Stones, Long Cairn 1100m NNW of Byrecleugh (SM361)	<b>Moderate (significant)</b>	N/A	<b>Moderate (significant)</b>
Byrecleugh Farmstead 1900m WNN of (SM4549)	<b>Moderate (significant)</b>	N/A	<b>Moderate (significant)</b>

## Access, Traffic and Transport

**13.17** The maximum traffic impact associated with construction is predicted to occur in Month 11 of the programme. During this month, an average of 68 HGV movements are predicted per day and it is estimated that there will be a further 42 car and light van movements per day to transport construction workers to and from the Site. The greatest magnitude of effect will occur along the D52 which is the proposed Site access road and the B6456.

**13.18** The assessment of significance suggests that the following receptors are considered likely to experience Significant effects in accordance with the EIA Regulations, prior to the application of mitigation measures:

- D52 Proposed Site Access Road Users;
- B6456 Users; and
- Core Path / Public Right of Way Users.

**13.19** It should be noted that the impacts relate solely to the peak of construction activities and that the construction period is short lived and the effects transitory in nature.

**13.20** The following measures will be implemented to mitigate any adverse effects of construction traffic during the construction phase:

- Construction Traffic Management Plan;
- Abnormal Load Transport Management Plan;
- Access Management Plan (AMP); and
- A Staff Sustainable Access Plan.

**13.21** Residual effects are all Minor and not significant. Significant traffic and transport effects are summarised in **Table 13.3**.

**Table 13.3: Significant traffic and transport effects**

Receptor	Potential Effect	Significance of Effect	Significance of Residual Effect
D52 Proposed Site Access Road Users	Severance	<b>Major (Significant)</b>	Minor Not significant
	Driver Delay	<b>Moderate / Minor (Significant)</b>	Minor Not significant
	Pedestrian Delay	<b>Major (Significant)</b>	Minor Not significant
	Pedestrian Amenity	<b>Major (Significant)</b>	Minor Not significant
	Fear & Intimidation	<b>Major (Significant)</b>	Minor Not significant

	Accidents & Safety	<b>Moderate (Significant)</b>	Minor Not significant
B6456 Users	Pedestrian Delay	<b>Moderate (Significant)</b>	Minor Not significant
	Pedestrian Amenity	<b>Major / Moderate (Significant)</b>	Minor Not significant
Core Path / Public Right of Way Users within the Site	Severance	<b>Major (Significant)</b>	Minor Not significant
	Driver Delay	<b>Moderate / Minor (Significant)</b>	Minor Not significant
	Pedestrian Delay	<b>Major (Significant)</b>	Minor Not significant
	Pedestrian Amenity	<b>Major (Significant)</b>	Minor Not significant
	Fear & Intimidation	<b>Major (Significant)</b>	Minor Not significant
	Accidents & Safety	<b>Major / Moderate (Significant)</b>	Minor Not significant

## Aviation

**13.22** The aviation assessment considered potential aviation effects. There is no agreed definition for assessing significance in an aviation context. Where potential effects on aviation interests have been identified, a mitigation solution has been proposed which will be implemented via a suitably worded planning condition. Following implementation of the mitigation no residual aviation effects are predicted.

## Other Issues: Climate Change Mitigation and Adaptation

**13.23** During operation **Moderate** (positive) effects are predicted for carbon losses and carbon offsetting (climate change mitigation). This increases to a **Major** (positive) effect for cumulative operational effects.

**13.24** Climate Change Mitigation and Adaptation effects are summarised in **Table 13.4**.

Table 13.4: Summary of Significant Effects on Other Issues

Other Issues: Climate Change Mitigation and Adaptation			
Predicted Effect	Significant	Mitigation	Significance of Residual Effect
Operation Effects			
Carbon Losses and Carbon Offsetting (climate change mitigation)	<b>Moderate (positive)</b>	None	<b>Moderate (positive)</b>



Cumulative Operation Effects			
Carbon Losses and Carbon Offsetting (climate change mitigation)	<b>Major (positive)</b>	None	<b>Positive (significant)</b>

## Interrelated Effects

**13.25** The EIA Regulations (Schedule 4, Paragraph 5) require that EIA Reports consider the interrelationships between aspects of the environment likely to be significantly affected by a development. It is considered that the following effects are interrelated:

- As highlighted in **Chapter 5**, relevant heritage assets are also discussed in the Landscape and Visual Impact Assessment (LVIA) presented in **Chapter 4** of this EIA Report. The Cultural Heritage assessment and LVIA consider different kinds of effects and receptors (cultural heritage vs people), and hence can come to differing conclusions on levels of effect relating to the same heritage asset without this indicating an error in either assessment.
- There is also some correlation between potential effects on residential properties resulting from noise effects during construction. Effects on noise are considered in **Chapter 9** and **Chapter 12** for construction traffic noise.
- There are potential relationships between effects on geology, hydrology, hydrogeology and peat and effects on ecology. Specifically, effects on fisheries as a result of construction and operational activities, which can have an effect on watercourse ecology and fish. However good practice design considerations have been implemented (e.g. offsetting all infrastructure from watercourses & waterbodies and using existing tracks where possible) therefore, there will be no significant effects and effects on fisheries remain scoped out of this assessment (see **Chapter 6**). In addition, changes to hydrology resulting from the Proposed Development could result in effects on groundwater dependent terrestrial ecosystems (GWDTEs), peatland habitats, aquatic habitats and other ecological receptors (for example, due to disruption of the hydrological processes that sustain GWDTEs). The potential for such interrelated effects has informed the assessment presented in **Chapter 8**. The bog and heathland restoration work proposed will also have beneficial on habitats and the species they support as detailed in the Outline Restoration and Enhancement Plan (OREP) in **Appendix 6.6**.
- There may be interrelationships between effects on ecology and ornithology in relation to the loss or reduction in quality of suitable habitats for breeding, or indirect effect on foraging due to the changes in conditions for prey items. The relevant effects in this respect have been considered for the purposes of the ornithological assessment presented in **Chapter 7**.
- There is the potential for a variety of effects of different kinds (particularly visual, noise and transport-related effects) to interact in a manner that influences the experience of residential amenity. The potential for such interactions has been taken into account within the EIA process for the Proposed Development. No effects beyond those reported within the relevant EIA Report chapters (**Chapter 4**, **Chapter 9** and **Chapter 10**) are predicted due to such an interaction.