Dalfad Wind Farm

EIA Scoping Report

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Basis of Report

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Acronyms and Abbreviations

Abbreviation	Definition
AILs	Abnormal Indivisible Loads
APDO	Approved Procedure Design Organisation
ART	Ayrshire Rivers Trust
ATC	Automatic Traffic Count
ATS	Air Traffic Service
AWI	Ancient Woodland Inventory
BDMP	Bird Disturbance Management Plan
BEMP	Biodiversity Enhancement Management Plan
BESS	Battery Energy Storage System
BGS	British Geological Survey
BNG	British National Grid
BoCC	Birds of Conservation Concern
CAA	Civil Aviation Authority
CAS	Controlled Airspace
CAP	Civil Aviation Publication (CAP)
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CMRA	Coal Mining Risk Assessment
CO_2	Carbon Dioxide
CP	Compensatory Planting
CRAA	Collision Risk Analysis Area
CRM	Collision Risk Model
CRTN	Calculation of Road Traffic Noise
CTMP	Construction Traffic Management Plan
CTR	Control Zone
dB	Decibels
DECC	Department for Energy and Climate Change
DfT	Department for Transport
DGC	Dumfries and Galloway Council
DMRB	Design Manual for Roads and Bridges
DTM	Digital Terrain Model
DWPA	Drinking Water Protected Area
EAC	East Ayrshire Council
EALDP	East Ayrshire Local Development Plan
EALWCS	East Ayrshire Landscape Wind Capacity Study
EASR	Environmental Authorisation (Scotland) Regulations

Abbreviation	Definition
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EnvCoW	Environmental Clerk of Works
ES	Environmental Statement
EU	European Union
FCS	Forestry Commission Scotland
FDP	Forest Design Plans
FES	Forest Enterprise Scotland
FLS	Forestry and Land Scotland
FSA	Forestry Study Area
GCN	Great crested newt
GCRS	Geological Conservation Review Sites
GDL	Garden and Designed Landscapes
GLVIA3	Guidelines for Landscape and Visual Assessment, Version 3
GPA	Glasgow Prestwick Airport
GPG	Good Practice Guide
GPP	Guidance for Pollution Prevention
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HEPS	Historic Environment Policy for Scotland
HER	Historic Environment Records
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicles
HRA	Habitats Regulations Assessment
HSI	Habitat Suitability Index
IEFs	Important Ecological Features
IEMA	Institute of Environmental Management and Assessment
IFP	Instrument Flight Procedure
INNS	Invasive non-native species
IOA	Institute of Acoustics
IOFs	Important Ornithological Features
km	kilometres
LBAP	Local Biodiversity Action Plan
LCT	Landscape Character Type
LDP	Local Development Plan
LGV	Light Goods Vehicle
LLA	Local Landscape Area

Abbreviation	Definition
LMP	Land Management Plans
LNCS	Local Nature Conservation Sites
LoS	Line of Sight
LTFP	Long Term Forest Plan
LVIA	Landscape and Visual Assessment
MAVRIC	Mapping Application for Visualising Road Injury Casualties
MB	Mixed Broadleaves
MB MC	Mixed Broadleaves Mixed Conifer
MB OG	Mixed Broadleaves Open Ground
MC	Mixed Conifer
MOD	Ministry of Defence
MW	Megawatts
NAVAIDS	Navigational Aids
NBN	National Biodiversity Network
NCAP	National Collection of Aerial Photography
NCN	National Cycle Network
NERL	National Air Traffic Services En-Route Plc
NFE	National Forest Estate
NHZ	Natural Heritage Zone
NKF	North Kyle Forest Estate
NPF4	National Planning Framework 4
NRTF	National Road Traffic Forecasts
NS	NatureScot
NSA	National Scenic Area
NTS	Non-Technical Summary
NVC	National Vegetation Classification
OG	Open Ground
OL	Other Land
OGL	Open Government Licence
OLS	Obstacle Limitation Surfaces
OWPS	Onshore Wind Policy Statement
PA	Planning Authority
PAC	Pre-Application Consultation
PAN	Planning Advice Notice
PARC	Priority Area for Red Squirrel Conservation
PLHRA	Peat Landslide Hazard and Risk Assessment
PMP	Peat Management Plan
PRA	Preliminary Roost Assessment
PRF	Potential Roost Features

Abbreviation	Definition
PSR	Primary Surveillance Radar
PWS	Private Water Supplies
RMS	Radar Mitigation Scheme
RSR	Route Survey Report
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation
SALWCS	South Ayrshire Landscape Wind Capacity Study
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SF	Scottish Forestry
SLC	South Lanarkshire Council
SNH	Scottish Natural Heritage
SPA	Special Protected Areas
SPP	Species Protection Plan
SPP	Scottish Planning Policy
SRSG	Scottish Raptor Study Group
SS	Sitka Spruce
SS LP	Sitka Spruce Lodgepole Pine
SSR	Secondary Surveillance Radar
SSRS	Saving Scotland's Red Squirrels
SSSI	Site of Special Scientific Interest
UKBAP	UK Biodiversity Action Plan
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UP	Unplanted
VHF	Very High Frequency
VP	Vantage Point
WFD	Waste Framework Directive
WLA	Wild Land Areas
WoSAS	West of Scotland Archaeology Service
WTG	Wind Turbine Generator
ZTV	Zone of Theoretical Visibility

1.0 Introduction

1.1 Background & Context

Brockwell Energy Limited ('The Applicant') intends to apply to the Scottish Ministers via the Scottish Government's Energy Consents Unit (ECU) for permission to construct and operate Dalfad Wind Farm (hereafter referred to as the 'Proposed Development') at a site (the 'Site') approximately 6 kilometres (km) northeast of Cumnock, East Ayrshire, Scotland. The approximate centre of the Site is located at British National Grid (BNG) reference NS 62781 21809.

The Proposed Development will comprise up to 14 turbines with a total generating capacity of approximately 80 to 90 MW.

1.2 The Applicant

The Applicant is Brockwell Energy Limited (BEL), a renewable energy development company based in Scotland, with headquarters in Edinburgh. BEL's main business areas are development of onshore wind, solar and battery energy storage systems. BEL is the developer of the North Kyle Energy Project in East Ayrshire, and the proposed Breezy Hill Energy Project, recently submitted to the Scottish Government's Energy Consents Unit. BEL has also developed two energy-from-waste facilities, one at Earl's Gate Energy Centre, Grangemouth and the other at Westfield, Fife. Since 2018, the Applicant has successfully delivered over £900m of projects in Scotland.

1.3 The Purpose of the EIA Scoping Report

The purpose of this EIA Scoping Report is to request an EIA Scoping Opinion from the Scottish Ministers under Regulation 12(1) of the EIA Regulations. This Opinion will delineate the scope and level of detail required in the Environmental Impact Assessment Report (EIAR) to support the planning application. The EIA Scoping Opinion will be adopted following consultation with the consultation bodies and other interested public bodies. The Applicant recognises the value of the scoping approach, and the purpose of this report is to ensure that information is provided in accordance with Regulation 12(2) of the EIA Regulations.

This EIA Scoping Report:

- describes the location of the Proposed Development;
- describes the nature and purpose of the Proposed Development;
- identifies key organisations to be consulted in the EIA process;
- establishes the format of the EIAR;
- provides baseline information; and
- describes potential significant effects and the proposed assessment methodologies for various technical assessments to be covered in the EIAR.

Each technical section concludes with queries for consultees regarding the information presented in this EIA Scoping Report. Feedback is requested on relevant questions, as not all may apply to every consultee. The list is not exhaustive, and consultees are encouraged to provide input on any issues they find pertinent to the Proposed Development. In cases where consultees choose not to respond, the Applicant will assume satisfaction with the proposed approach.

1.4 Structure of the EIA Scoping Report

The remainder of this EIA Scoping Report is comprised as follows:

- **Section 2**: Approach to EIA, summary of consultation strategy and structure of the EIAR.
- **Section 3**: Description of the Proposed Development including the Site location and context as well as details of the design iteration undertaken to date.
- **Sections 4 to 15**: A consideration of each environmental topic. Topics will either be 'scoped-in' (i.e. assessed within an EIAR chapter), or 'scoped-out'. A summary is provided of the environmental surveys and studies undertaken to date and proposed, assessment methodologies, potential significant effects of the Proposed Development and potential mitigation and enhancement measures.
- **Section 16**: A summary of the topics to be scoped-in and scoped-out of the EIA.

Figures are attached in **Appendix A**.

2.0 Environmental Impact Assessment

2.1 Approach to EIA

The EIA Regulations require that before consent is granted for certain types of development, an EIA must be undertaken. The EIA Regulations set out the types of development which must always be subject to an EIA (Schedule 1 development) and other developments which may require EIA if there is the potential for significant environmental effects as a result of the development (Schedule 2 development).

The Proposed Development falls within Schedule 2 of the EIA Regulations and has the potential to have some significant environmental effects. Therefore, it is the opinion of the Developer that the Proposed Development qualifies as "EIA Development" and therefore the Developer will voluntarily submit an EIAR as part of a Section 36 application and has not requested an EIA Screening Opinion.

EIA is a process which includes the requirement for the preparation of an EIA Report by the Applicant. The EIA will be undertaken in line with the EIA Regulations and current good practice guidance. The results of the EIA will be presented within an EIA Report as per Schedule 4 of the EIA Regulations.

In line with the recently issued Guidelines on Streamlining Environmental Impact Assessment for Onshore Wind Farms (Scottish Renewables, September 2025), the EIA Report will not contain *"generic EIA methodology and topic specific assessment methods or approach where this is 'standard' and in accordance with good practice guidance except by brief cross reference and / or links".* Instead, the focus of any discussion of approach or methodology will be on agreeing any project specific details or deviations from guidance. Furthermore, the guidelines state that the "*EIA Report can rely on agreements on method made through the Scoping process and make brief cross reference to key terms of reference without repeating the content of such guidance*".

2.2 Consultation

Stakeholder engagement is a key part of the EIA process and will be undertaken throughout the EIA process to agree assessment methodologies as well as address concerns consultees may have. Relevant stakeholders consulted will be agreed with the ECU and will vary depending on the technical topic.

Public consultation will also be undertaken by the Applicant following the guidance provided by the ECU and the expectation to hold public consultation events. The Applicant will hold at least two public consultation events following the submission of this EIA Scoping Report and prior to the Proposed Development design freeze. The dates and locations of the events are to be confirmed.

2.3 EIA Report Format

The structure of the EIA Report will follow the requirements of the EIA Regulations (Schedule 4) and relevant good practice guidance. The EIA Report will comprise five volumes:

- Volume 1: Non-Technical Summary;
- Volume 2: Main Report;
- Volume 3a: Figures and Drawings;
- Volume 3b: Visualisations;
- Volume 4: Technical Appendices; and

- Volume 5: Confidential Information.

Volume 2 will be streamlined to follow the Scoping Opinion, and will include the following chapters:

- Introduction;
- Project Description;
- Design Evolution and Alternatives;
- Specialist Topic Chapters, including:
  - Landscape and Visual Impact including Residential Amenity;
  - Cultural Heritage;
  - Ecology;
  - Ornithology;
  - Geology, Hydrogeology, Hydrology and Peat, including Outline Peat Management Plan and Carbon Balance;
  - Noise;
  - Access, Traffic and Transport.
- Summary of Significant Effects and Schedule of Environmental Commitments (including Summary of Mitigation Measures).[1]

The Section 36 Application will be accompanied by the following standalone documents:

- A Planning Statement assessing the Proposed Development against all relevant planning and energy policy;
- A Pre-Application Consultation (PAC) Report explaining the consultation carried out with the local communities about the Proposed Development; and
- A Socio-Economic, Recreation and Tourism Report.

Early consultation is key in the development process, and throughout the design and EIA process, the Applicant will ensure that local communities and stakeholders are given the opportunity to provide feedback.

In addition to the technical appendices relating to each technical topic, the following will be set out in Volume 4 of the EIA Report (Technical Appendices):

- Aviation and Radar;
- Shadow Flicker; and
- Telecommunications and Utilities.

[1] In line with the Guidelines on Streamlining EIA for Onshore Wind Farm (Scottish Renewables, September 2025), chapter-specific mitigation measures will be clearly presented at the end of each chapter and also collated into a single chapter for ease of reference by decision makers; where possible, this will be accompanied by map-based information, e.g. identifying areas where specific additional measures are required.

3.0 Proposed Development

3.1 Site and Surrounds

Located approximately 6 km north-east of Cumnock, and 28 km east of Ayr, the Site falls within the East Ayrshire Council (EAC) administrative area, as shown on **Figure 3.1**. The Site centre can be found at British National Grid (BNG) reference NS 62781 21809, with the northern part of the Site located on the former Dalfad Opencast Mine and the southern part of the Site consisting of agricultural land. The Dalfad Opencast Mine is a poorly restored brownfield site which is currently owned by Caledonian Rural, and is one of the mining sites that formed part of EAC's priority area for restoration[2].

The Site is situated in a predominantly rural environment, characterised by agricultural land, forestry and former coal mining sites with several remaining open mining voids in the local area, one of which is located within the Site. The northern section of the Site includes the former Dalfad Coal Mine and part of the former Duncanziemere Coal Mine. The coal in these areas was formerly mined using both opencast and underground methods. While the mining companies abandoned the mining operations on the Site in 2013, leaving the sites derelict, the EAC worked with the landowners to undertake restoration work to *"Make Safe, Make Good, Make New"*[3]. In 2021, the Dalfad Coal Mine was identified by the EAC in their report titled, "Opencast Coal Mining in East Ayrshire – Completion of Restoration and Recovery Activity"[3] as being fully restored. Aftercare of the Dalfad Coal Mine is being carried out by the landowner, and is being monitored by EAC[3]. Whilst EAC's works have ensured a safe site and restoration works have been delivered by EAC and the current site owners, there remains significant opportunity to improve the restoration and ecology of the site. The Duncanziemere Coal Mine has undergone limited restoration works in association with the extraction of remaining coal reserves but the mine was identified by the EAC in their 2021 report as undergoing ''Aftercare'. The Duncanziemere Coal Mine is still considered brownfield and in need of restoration betterment.

An area of plantation conifer forestry is immediately adjacent to the east.

There are a number of residential and commercial properties located within 5 km of the Site, with most being along the route of the A70 which runs north-east to south-west, to the west of the Site.

The settlement of Cronberry is approximately 1.5 km to the west of the Site, and Lugar is approximately 3 km west of the Site. Muirkirk is approximately 6.5 km to the northeast of the Site.

The Site is in the northern reaches of the Galloway and Southern Ayrshire Biosphere, a UNESCO site which includes iconic wildlife and natural habitats which are recognised as being of international importance[4]. The Biosphere encompasses communities with distinct cultural identities, as well as historic landmarks and heritage sites.

[2] East Ayrshire Council, 2013. "Opencast Mining in East Ayrshire –Steps to Recovery, Council". https://www.east-ayrshire.gov.uk/CouncilAndGovernment/About-the-Council/MinutesAgendasAndReports/OpencastCoalUpdate.aspx

[3] East Ayrshire Council, 2021. "Opencast Coal Mining in East Ayrshire –Completion of Restoration and Recovery Activity". https://www.east-ayrshire.gov.uk/CouncilAndGovernment/About-the-Council/MinutesAgendasAndReports/OpencastCoalUpdate.aspx

[4] Galloway and Southern Ayrshire Biosphere (2002). https://www.gsabiosphere.org.uk/ [Accessed 04/11/2025]

Ecological designations near the Site include:

- Muirkirk and North Lowther Uplands Special Protection Area (SPA) which slightly overlaps the northern Site boundary;
- Muirkirk Uplands Site of Special Scientific Interest (SSSI) which is coincident with the Muirkirk and North Lowther Uplands SPA;
- Airds Moss Special Area of Conservation (SAC) approximately 500 m north-west of the Site;
- Airds Moss RSPB Reserve which is mostly within the Airds Moss SAC;
- Low Moss Local Nature Conservation Site (LNCS), which overlaps the western Site boundary; and
- Glenmuir Water: Lugar to Kyle Castle LNCS, which slightly overlaps the south-western Site boundary.

There are a number of small and isolated areas of ancient woodland located within 5 km of the Site, three within the Site boundary and one immediately adjacent to the southeast of the Site.

There are several undesignated cultural heritage sites within the Site boundary that are directly related to historical coal mining. Within the wider area, the Lugar Conservation Site is approximately 2 km to the west of the Site. There are a number of Category B and C listed buildings within 5 km of the Site, the closest being Glenmuir Bridge (approximately 450 m west of the Site) and Lugar Viaduct (approximately 2 km west of the Site). The closest Scheduled Monument is Kyle Castle, approximately 1.2 km southeast of the Site.

3.2 Proposed Development Description

The Proposed Development will consist of up to 14 standalone, three bladed horizontal axis turbines. An indicative Site layout, including indicative turbine locations, is provided in **Figure 3.2**. The indicative turbine locations and key parameters are noted in **Table 3.1**.

Table 3.1: Indicative Proposed Turbine Locations and Key Parameters

Turbine Number	Easting	Northing	Height to Tip (m)	Indicative Hub Height (m)	Indicative Rotor Diameter (m)
1	263469	623815	200	119	162
2	263351	623260	200	119	162
3	262799	623243	200	119	162
4	262944	622710	200	119	162
5	263425	622587	200	119	162
6	262314	622631	200	119	162
7	262925	622109	200	119	162
8	262875	621607	200	119	162
9	263075	621176	200	119	162
10	263236	620709	200	119	162
11	262497	621005	200	119	162

Turbine Number	Easting	Northing	Height to Tip (m)	Indicative Hub Height (m)	Indicative Rotor Diameter (m)
12	262269	621346	200	119	162
13	262647	620567	200	119	162
14	263079	619990	149.9	82	136

New access tracks would connect each of the turbines and would provide access and egress from the A70 at Welltrees. The Proposed Development would include a substation compound and buried cables between the turbines. Grid connection will be a separate application and does not form part of the Proposed Development for the purposes of this EIA process. Areas of ecological enhancement will be provided, the detail of which will be established following site surveys as part of the iterative design process.

3.3 Design Evolution

The indicative proposed layout as shown in **Figure 3.2** was generated using an environmentally-led approach which took account of environmental constraints, technical requirements and economic factors as they are currently understood.

3.3.1 Baseline Surveys

Several baseline surveys have been undertaken on the Site to date including:

- Ecology habitat and protected species surveys;
- Ornithology surveys;
- Phase I peat surveys;
- Initial desktop landscape and visual design appraisal.

The results of these baseline surveys and appraisal were used to inform the Scoping design.

3.3.2 Design Principles

The overarching principles guiding the design of the Proposed Development aim to maximise renewable energy generation while:

- minimising the land disturbance needed for constructing the wind farm infrastructure as much as possible;
- reducing potential impacts on sensitive receptors wherever possible;
- minimising the number of watercourse crossings;
- applying the waste management hierarchy, such as reusing materials on site rather than removing and disposing of them in landfill; and
- identifying potential opportunities for environmental enhancement, access improvement and community benefits.

These design principles have been employed by the Applicant in forming the Scoping layout presented in **Figure 3.2**, and will continue to be used throughout the iterative design process.

3.3.3 Design Objectives

The overall design objectives are to maximise the renewable energy yield, while minimising potential adverse impacts on the receiving environment, while also identifying opportunities to enhance the natural environment and benefit the local communities.

The design of the Proposed Development is being informed by a robust design iteration process, considering potential environmental, landscape and visual impacts and their effects, physical constraints, safe and efficient operation of the development, and health and safety considerations. The information used to inform the design iteration process includes baseline data (desk studies and field surveys), review of preliminary visualisations, impact assessments and consultation feedback.

The overarching aim is to design the Proposed Development layout in such a way as to represent the most appropriate design, considering acceptable limits for potential environmental impacts and physical constraints, while maximising the renewable energy generating capability of the Site and maintaining financial viability of the Proposed Development.

Key design considerations and drivers for change throughout the environmentally led design iteration process will be set out in the EIAR. At this stage, it is anticipated that the design will mainly be influenced by the following factors (listed in no particular order of importance), although this may change as the design evolves:

- residential amenity of residential properties in relatively close proximity to the Site;
- presence of peat deeper than 0.5 m in parts of the Site;
- hydrology;
- ecology;
- ornithology; and
- aviation.

Other major considerations driving the design and layout of the Proposed Development include sustainability principles such as:

- reusing existing infrastructure wherever possible;
- minimising infrastructure footprint and potential impacts on sensitive environmental receptors; and
- identifying potential opportunities to enhance biodiversity as well as public access and recreation.

It is expected that further iterations of the design will occur as part of the EIA process. The evolution of the design will be discussed in the EIAR, as will the various alternatives that have been considered during the design process.

3.3.4 Scoping Layout

The initial (Scoping) layout of the Proposed Development is shown on **Figure 3.2**. Since key information such as peat depths, ecological and ornithological baseline data was available early on, it was decided that it would be most efficient and effective to use this data to inform the Scoping design, along with information from an initial landscape and visual design review. A pre-scoping workshop was held which was attended by all EIA team leads as well as design engineers and the Applicant. Using the available information and preliminary design review feedback, the Scoping Layout (presented in **Figure 3.2**) was designed.

There are several components of the design which are under review, with various alternatives being investigated. These include, but are not limited to, the following:

- Location, number and dimensions of construction compounds;
- Location of substation;
- Potential alternative access;
- Potential heritage enhancements and public recreational access.

Initial comment on the Scoping design from EAC and consultees is welcomed.

3.4 Lifecycle Phases

3.4.1 Construction

Construction phase impacts would relate primarily to activities which would alter the existing environment, such as excavation, importing of materials and erection of infrastructure, to name a few. The main concerns from an EIA perspective during construction are the potential effects on sensitive receptors which include nearby residents, sensitive habitats and protected species, birds, peat and downstream hydrology receptors. The temporal as well as spatial effects on these receptors will be considered in depth in the EIAR.

3.4.2 Operation

Once the construction phase is completed, the Proposed Development would be operational for a period of approximately 40 years. The potential effects on sensitive receptors during this phase of the lifecycle of the Proposed development will also be considered in the EIAR.

3.4.3 Decommissioning

Activities during decommissioning would be similar to those of the construction phase, except in reverse. In line with the Scottish Renewables guidance on streamlining wind farm EIAs, it is proposed to **not** include any specific assessment of the effects of decommissioning. This is because:

- The effects would be similar to or less than the effects of the construction phase; and
- The effects would occur many years in the future and therefore the baseline conditions at the time of decommissioning cannot be accurately known at the time of assessment.

3.5 Cumulative Developments

The EIA Regulations state that cumulative effects should be considered as a part of the EIA. It will therefore be important to consider the cumulative effects of the Proposed Development with other developments in the area, including those that are currently operational (part of the existing baseline), under construction, consented and those that are the subject of a live planning application or a live application under the Electricity Act 1989. The cumulative assessment will also consider the cumulative effects of different elements of the Proposed Development on environmental media and sensitive receptors.

The methodology to be adopted for assessing the cumulative effects of wind energy developments will be in accordance with the NatureScot (NS, 2021) Guidance ‘Assessing Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments’. The scope of the cumulative assessment for each technical topic is set out in the respective sections of this Scoping Report and will be agreed as required through further consultation with regulators including EAC and NatureScot.

It should be noted that the record of relevant developments to be included in the cumulative impact assessment will be updated throughout the EIA process, up to an agreed point prior to submission of the application. We welcome any further information from stakeholders on additional proposed wind farm developments that should be considered.

3.6 Questions for Consultees

Q3.1 Do consultees have any initial comments or concerns regarding the Scoping layout?

Q3.2 Do consultees agree that the effects of decommissioning can be scoped-out of the EIA?

Q3.3 Is the general approach to assessment of cumulative effects acceptable?

4.0 Landscape and Visual

4.1 Introduction

This chapter sets out the proposed approach to assessing the potential effects of the Proposed Development on landscape character and visual amenity through a Landscape and Visual Impact Assessment (LVIA).

The LVIA will consider effects on landscape fabric, landscape character, the special qualities of designated landscapes, and on visual receptors. Cumulative effects will also be considered, i.e. the incremental effects of the Proposed Development in combination with other existing and proposed wind farm developments.

It will examine the nature and extent of effects arising from the introduction of the proposed turbines, as well as the ancillary infrastructure (i.e. substation, access tracks, etc.) which will be assessed during the construction and operational phases of the Proposed Development.

The primary guidance for LVIA is the Landscape Institute and the Institute of Environmental Assessment's 2013 Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3) as updated by LI-TGN-2024-01 Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3). In addition, NatureScot has published several documents that have been adopted as industry standard good practice for landscape and visual assessments of wind farm proposals.

4.2 Baseline Conditions & Scope of Assessment

4.2.1 The Site and Wider Context

The Site includes areas of previous open cast coal mining and moorland, and forms part of a gently undulating area of higher ground between the River Ayr and A70 corridor, and the valleys of Glenmuir Water and Gass Water. A block of forestry lying directly to the east of the Site was the subject of an application for the Drum wind farm, which was refused planning permission by EAC in October 2025.

The nearest settlement is a linear hamlet at Cronberry, approximately 1.5 km to the west and there are a number of larger settlements within 5-10 km to the west of the Site, including Lugar, Logan, Cumnock and Auchinleck. A pattern of nucleated settlements continues to the northwest and west. In other directions, settlement is more sparse with New Cumnock (including Pathhead and Mansfield) approximately 5.6 km to the south and Smallburn and Muirkirk 5-6 km to the northeast.

There are few Core Paths within 5 km of the Site, with the closest being short routes through the edges of Cumnock, and the long distance River Ayr Way which follows the river approximately 3 km to the north of the Site.

There are consented and operational wind farms within 10-15 km in all directions except to the west of the Site.

4.2.2 Study Area

As shown by **Figure 4.2**, there is extensive operational and consented wind farm development within 10-15 km from the Site in all directions except to the west, northwest and north. The bare ground ZTV study provided in **Figure 4.1** illustrates that visibility would be relatively limited beyond 10-15 km except to the southwest, west and northwest, where visibility becomes increasingly patchy beyond 20 km. Given the distribution of operational and consented wind farms and theoretical visibility (including from designated landscapes as shown on **Figures 4.1** and **4.2**), a 25 km study area is proposed as shown on **Figure 4.2**.

4.2.3 Landscape Character

The Site and most of the area of theoretical visibility are within East Ayrshire as shown by **Figure 4.2**. The landscape character types (LCTs) identified within the East Ayrshire Landscape Wind Capacity Study (2018)[5] (EALWCS) will be considered as the relevant receptors within this area, with baseline description drawn from the equivalent LCTs within the NatureScot national landscape character assessment (2019)[6].

Most of the Site and proposed turbine locations would be within LCT 18a Plateau Moorlands, with lower lying areas and turbine locations to the south and west bordering or within LCT10 Upland River Valley.

Part of the study area to the west of the Site is within South Ayrshire. The landscape character types identified within the South Ayrshire Landscape Wind Capacity Study (2018)[7] (SALWCS) will be considered as the relevant receptors within this area, with baseline description drawn from the equivalent LCTs within the NatureScot national landscape character assessment (2019).

As shown by **Figure 4.2**, the presence of operational and consented wind farms and limited visibility of the Proposed Development indicate that effects on landscape character within South Lanarkshire and Dumfries and Galloway would be expected to be negligible. Effects on landscape character in these areas are proposed to be scoped out of assessment.

4.2.3.1 Landscape Character – Summary of Proposed Scope

Landscape Character Types (LCTs) within East Ayrshire and South Ayrshire will be considered within the assessment where they:

- lie within the proposed 25 km study area;
- would have more than limited visibility of the Proposed Development; and
- are not influenced by existing and consented wind farms to the degree that further effects from the Proposed Development are unlikely to arise.

Based on the scoping stage design, this would be expected to include the following LCTs within East Ayrshire:

- LCT 18a Plateau Moorlands (includes Site);
- LCT 10 Upland River Valley (includes Site, and 2.2 km north and 4.3 km south);
- LCT 15 Upland River Basin (4.3 km, southwest);
- LCT 7c East Ayrshire Lowlands (1.5 km, north and other areas within 8 km to the west and northwest);
- LCT 9 Lowland River Valley (4.5 km, west); and
- LCT 19 East Ayrshire Plateau Moorlands (4.1 km, north).

Based on the scoping stage design, this would be expected to include to the following LCTs within South Ayrshire:

[5] East Ayrshire (2018). Landscape Wind Capacity Study. Available at: https://www.east-ayrshire.gov.uk/Resources/PDF/L/Landscape-wind-capacity-study.pdf

[6] NatureScot (2019). Landscape character Assessment. Available at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

[7] South Ayrshire (2018). Landscape Wind Capacity Study. Available at: https://www.south-ayrshire.gov.uk/media/8247/South-Ayrshire-Landscape-Wind-Capacity-Study-Final-August-2018/pdf/South_Ayrshire_Landscape_Wind_Capacity_Study_-_Final_August_2018.pdf?m=1678826246583

- LCT 7d South Ayrshire Lowlands (14.3 km and 17.7 km west);
- LCT 9 Lowland River Valley (14.7 km, west); and
- LCT 16 Lowland Hills (17.6 km, west).

All other LCTs are to be scoped out of assessment as not meeting the criteria set out above.

4.2.4 Landscape Designations

There are no National Parks or National Scenic Areas within 45 km from the proposed turbine locations.

There are Local Landscape Areas (LLA) designated within East Ayrshire. The most recent baseline evaluation of these is provided within the Local Landscape Areas draft Supplementary Guidance (2024)[8] which will be used to inform the assessment. As shown by **Figure 4.2**, the closest of these is LLA 2 Uplands and Moorlands, directly to the east of the proposed turbine locations. LLA 1 River Ayr Valley is located approximately 3 km to the northwest.

LLA 3 River Doon Valley is also within the proposed 25 km study area, but as shown by **Figure 4.2** would have limited visibility and lies on the far side of extensive consented and operational wind farm development. Given this context, effects would be expected to be negligible and are proposed to be scoped out of assessment.

Part of the study area to the west is within South Ayrshire and includes the locally designated Ayr Valley Local Landscape Area. The most recent baseline evaluation of this area is provided in the South Ayrshire Local Landscape Designations Review[9] which will be used to inform the assessment.

As shown by **Figure 4.2**, the presence of operational and consented wind farms and limited visibility of the Proposed Development indicate that effects on locally designated landscapes within South Lanarkshire and Dumfries and Galloway would be expected to be negligible and are proposed to be scoped out of assessment.

4.2.4.1 Other Landscapes with Recognised Qualities

There are a number of Gardens and Designed Landscapes (GDL) within the proposed study area. Effects on these will primarily be considered within the Cultural Heritage chapter of the EIA Report. Where a GDL is open to the public as a visitor destination and visibility would arise, visual effects on visitors will be considered (see section 4.2.5 below).

There are no Wild Land Areas within 30 km of the Site and a Wild Land Assessment is not considered to be required.

4.2.4.2 Landscape Designations – Summary of Proposed Scope

East Ayrshire:

- LLA 1 River Ayr Valley (3.1 km, northwest), and
- LLA 2 Uplands and Moorlands (0.1 km, east).

[8] East Ayrshire (2024). Local Landscape Areas Draft Supplementary Guidance. Available at: https://www.east-ayrshire.gov.uk/Resources/PDF/P/planning-sg-local-landscape-area.pdf

[9] South Ayrshire (2018). South Ayrshire Local Landscape Designations Review. Available at: https://www.dpea.scotland.gov.uk/Document.aspx?id=731137

South Ayrshire:

- The River Ayr LLA (14.9 km, west).

All other designated landscapes to be scoped out of assessment for the reasons set out above.

4.2.5 Visual Receptors

Visual receptors will be considered within the proposed 25 km study area where they would have visibility of the Proposed Development and where operational and consented wind farms do not intervene such that visual effects would be negligible.

Visual receptors considered within the assessment will include residents of and visitors to settlements and dispersed settlement; recreational walkers, equestrians and cyclists using long distance routes, rights of way and Core Paths; road users on local roads and key routes; and visitors to recognised destinations and viewpoints.

4.2.5.1 Key Routes

Based on the scoping stage design it is proposed that effects on users of the Southern Upland Way (18.1 km, southeast) would be scoped out of assessment due to limited visibility, distance and the presence of intervening wind farms where visibility would arise. Effects on users of the River Ayr Way (2.9 km, north) will be considered in the assessment.

As shown by **Figure 4.2**, the only National Cycle Network routes in the study area are located more than 23 km from the proposed turbines and would have limited or no visibility. It is proposed that effects on users of these routes are scoped out of the assessment.

Based on the scoping stage design it is proposed that effects on users of the A719 (18.7 km, northwest) and A71 (13.4 km, north) would be scoped out of assessment due to limited visibility and distance; whist effects on users of the A70 (0.7 km, north), A76 (5 km, southwest) and railway between Kilmarnock and New Cumnock (4 km southwest) will be considered in the assessment.

4.2.5.2 Visitors to GDLs

As shown by **Figure 4.2**, the only GDL with notable visibility within the proposed study area would be Dumfries House and visual effects on visitors to the gardens will be considered in the assessment.

4.2.5.3 Representative Viewpoints

Representative viewpoints will be used to inform the assessment of effects and will represent a range of distances, directions and receptors as set out in **Table 4.1**. The locations of the proposed viewpoints are shown on **Figures 4.1** and **4.2** in **Appendix A**.

Table 4.1: Proposed Representative Viewpoints

VP	Location	Distance*, Direction	Receptors
1	A70	0.9 km, NW	Road users
2	Cronberry	1.9 km, W	Residents and visitors
3	Glenmuir valley	0.7 km, SW	Local road users and residents
4	Logan	3.7 km, W	Residents and visitors
5	Barshare	4.6 km, W	Residents and visitors
6	Craigens	4.6 km, SW	Residents and visitors

VP	Location	Distance*, Direction	Receptors
7	Cairn Road	7.7 km, SW	Core Path users, local road users
8	Auchinleck	6.7 km, W	Residents and visitors
9	Dumfries House	8.9 km, W	Visitors
10	Ochiltree	12.2 km, W	Residents and visitors
11	Tarbolton	19.1 km, NW	Residents and visitors
12	B743	4.4 km, N	Road users
13	River Ayr Way	3.0 km, NE	Walkers
14	Smallburn	5.7 km, NE	Residents and visitors
15	Cairn Table	9.0 km, E	Walkers
16	New Cumnock	7.2 km, S	Residents and visitors

* Distances in **Table 4.1** have been approximated from the proposed viewpoint location to the nearest turbine of the Scoping Layout.

Additional views may also be provided to illustrate points in the assessment but will not be treated as representative viewpoints. These will include Catrine, Mauchline, Coylton and Drongan, where the ZTV studies indicate extensive visibility but, in reality, visibility would be very limited.

4.2.6 Night-time Impacts

The study area and receptors for night-time impacts are proposed to be the same as for effects during the day.

The Galloway Dark Sky Park is located approximately 21 km to the southwest but would have no hub height visibility (where aviation lights may be visible) within 25 km as indicated by **Figure 4.2** and is proposed to be scoped out of the assessment. There are no other recognised or promoted Dark Sky locations within the study area.

Wireline visualisations will include indications of lit turbines for all representative viewpoints. Additional night-time photomontages will be provided for viewpoints 2 (Cronberry), 5 (Barshare) and 14 (Smallburn) to represent views from settlements in different directions and at different distances. Lights on turbines within cumulative developments will be included in visualisations where relevant.

4.2.7 Cumulative Impacts

Effects with operational and consented developments which are expected to be constructed will be considered in the main assessment.

If there are consented developments which are less likely to be constructed, these will be considered in the assessment of cumulative effects, along with developments in planning.

Wind farms at earlier stages (screening or scoping) will not be considered in the assessment unless:

- There is good reason to do so – such as proximity or the expectation of an imminent application, and
- there is sufficient information available on which to base an assessment.

All wind farms in the study area which comprise three or more turbines of greater than 50 m in height will be included. Smaller schemes will only be included where they are within 5 km of the proposed turbines.

4.2.8 Residential Visual Amenity

A 2 km study area from the turbine locations is proposed for the consideration of effects on residential visual amenity. This area includes homes along the A70 corridor to the north of the Site; at Cronberry to the northwest, and those accessed via the local roads to the west, southwest and south of the Site.

4.3 Approach to Assessment

No deviation from established guidance is proposed for either the assessment methodology or preparation of visualisations.

4.4 Potential Sources of Impact

The selection of receptors to include in the assessment is based on the requirement for EIA to consider the likely significant effects. Effects that are not likely to be significant do not require assessment under the EIA Regulations.

Effects arising from the Proposed Development will be considered at the following key stages. The nature of the potential effects relevant to the assessment for each stage will be:

4.4.1 Construction

The construction of the Proposed Development would involve the delivery of materials and components to Site; groundworks to form the tracks, turbine foundations and hardstanding areas and the construction of the substation and control building. Cranes would be used to erect the turbines and would be on site for a small part of the short-term construction period.

Effects during construction on landscape fabric would be expected arise from:

- Groundworks for the turbine foundations, crane hardstandings, control building, substation and associated hardstanding areas and access tracks.

Effects during construction on landscape character would arise from:

- Short-term construction activity within the Site.
- Changes to landscape fabric as described above.
- Changes to views towards the Site which would include large cranes (when on site), completed and partially completed turbines.

Effects during construction on visual receptors would arise from:

- Short-term movement of vehicles and plant, including large cranes, within and travelling to and from the Site to deliver and install the turbines and other site infrastructure.
- Changes to views towards the Site which would include the cranes (when on site), completed and partially completed turbines, with increasing similarity to the operational scheme as turbine construction is completed.

Effects during construction on designated landscapes would arise from:

- Short-term changes to the special qualities as a result of views of the construction activity taking place within the Site.

4.4.2 Operation

It is expected that the Proposed Development would be in operation for around 40 years. Effects during operation on landscape fabric would arise from:

- Changes as a result of the implementation of any proposed habitat management.
- The presence of the wind farm infrastructure.

Effects during operation on landscape character would arise from:

- Physical changes to host landscape, as set out above.
- The presence and motion of the wind turbines and the presence of associated infrastructure within the Site.

Effects during operation on visual receptors would arise from:

- Changes to views towards the Site to include the presence and motion of the wind turbines and other on-site infrastructure, both from static locations and when moving along routes.

Effects during operation on designated landscapes would arise from:

- Changes to the special qualities as a result of vulnerability of the wind turbines when viewed from designated landscapes.

4.5 Consultation

No consultation has been undertaken to date. NatureScot and East Ayrshire Council will be consulted with regards to agreeing the scope of the LVIA as proposed within this chapter, to finalise agreement on study areas, documented baseline and viewpoint locations.

4.6 Matters Scoped Out

The following matters are proposed to be scoped out of assessment:

- Consideration of landscape and visual receptors beyond 25 km.
- Consideration of cumulative developments beyond 25 km.
- Consideration of cumulative developments with fewer than three turbines, or less than 50 m in heigh, unless located within 5 km.
- Consideration of effects on landscape receptors within 25 km, except those listed at section 4.2.3.1.
- Consideration of effects on designated landscapes within 25 km, except those listed at section 4.2.4.2.
- Consideration of effects on users of the A719 and A71 – due to distance and limited visibility.
- Consideration of effects on users of the Southern Upland Way – due to distance, limited visibility and the presence of intervening wind farms where visibility would arise.
- Consideration of effects on users of National Cycle Network routes – due to distance and limited visibility.
- Consideration of effects on visitors to GDLs (except for Dumfries House) – due to limited visibility.
- Consideration of effects on the Galloway Dark Sky Park – due to no hub visibility within 25 km.
- Consideration of effects on residential visual amenity beyond 2 km.

4.7 Questions for Consultees

Q4.1 Is the proposed 25 km study area adequate to identify all potentially significant effects?

Q4.2 Do you agree with the proposed viewpoint locations?

Q4.3 Do you agree with the proposed night-time photomontage locations?

Q4.4 Do you agree with the list of matters to be scoped out?

Q4.5 Are there any cumulative developments at scoping which you consider should be included (noting the requirements for inclusion of such schemes as set out at section 4.2.7)?

Q4.6 Is the proposed 2 km study area for the consideration of residential visual amenity acceptable?

5.0 Cultural Heritage

5.1 Introduction

This section outlines the proposed scope and methodological approach for the archaeology and cultural heritage chapter of the EIA Report. The chapter will assess the potential effects resulting from the Proposed Development on archaeology and cultural heritage assets, which include:

- World Heritage Sites;
- Scheduled Monuments;
- Listed Buildings;
- Inventoried Gardens and Designated Landscape (GDLs);
- Inventoried Battlefields;
- Conservation Areas; and
- non-designated heritage assets, such as locally and regionally important heritage features.

The cultural heritage impact assessment will:

- identify cultural heritage assets that may be subject to significant effects, both within the limits of the Proposed Development and within a defined Study Area;
- establish the potential for currently unknown archaeological assets to survive buried within the Site;
- assess the predicted effects on these assets; and
- propose a programme of mitigation where appropriate.

The assessment will consider direct effects (such as physical disturbance or changes to an asset's setting), indirect effects (such as increased pollution or changes in water draining patterns which can indirectly affect the preservation of heritage materials), and cumulative effects (where assets affected by the Proposed Development are also likely to be affected by other unrelated development proposals).

This section is supported by the following:

- Appendix B: Cultural Heritage Appraisal
- Figure 5.1: Heritage Designations

5.2 Environmental Baseline

A high-level review of the baseline conditions has been undertaken with reference to the publicly available historic environment data, the Site boundary and the scoping turbine layout. This may be subject to change according to subsequent design iterations.

5.2.1 Established Baseline Conditions

5.2.1.1 Assets within the Site Boundary

There are no designated heritage assets within the Site boundary, however, there are 23 non-designated heritage assets within the Site boundary.

The assets within the Site are demonstrative of the varied ways that the land within the Site has been used throughout multiple time periods.

There is evidence of historic agricultural use of the land, through the presence of the remains of sheepfolds, farmsteads and enclosures. This agricultural land use continues to the present day within the south of the Site.

The most notable remains within the Site are those related to the industrial activity from the later post-medieval and early modern periods. These include the Gass Water Baryte Mine, Gass Water Lime Works and Cairn Water Colliery, as well as associated infrastructure.

The northern portion of the Site has been subject to five archaeological surveys and investigations[10], due to planning applications for the extension of the pre-existing open cast mining activity. Some of the assets within **Table 5.1** may no longer be extant due to the mining that has taken place previously within the Site. Their presence or absence will be confirmed during the walkover survey.

A full commercial Historic Environment Records (HER) data search will be undertaken ahead of the baseline survey and used to inform an understanding of key constraints.

Table 5.1: Heritage Assets within the Site Boundary

HER Reference	Asset Name	Asset Type	Period
46693	Welltrees	Building	Post-medieval
46692	Welltrees	Farmstead	Post-medieval
14250	Welltrees/Auchinleck	Enclosure	Undated
14254	Welltrees/Auchinleck	Enclosure	Undated
46690	Gass Water	Building	Undated
50637	Gass Water / Gass Water Barytes Mine	Aerial ropeway	Modern
9114	Gass Water	Barytes Mine	Modern
14320	Gass Water	Enclosure	Undated
46694	Gass Water	Sheepfold	Undated
22051	Cairn Hill 1 and 2, Colliery	Coal Mine	Modern
12208	Gass Water	Building; Lime Kilns; Railway; Coal Mine	Modern
46687	Gass Water	Bell Pits	Undated
46695	Gass Water	Building	Undated
12207	Gass Water	Buildings; Stables; Race Course	Post-medieval
46696	Dalfad	Industrial; Coal Mine	Undated
46686	Dalfad	Farmstead	Undated
46683	Gass Water	Industrial; Coal Pit	Undated
46884	Glenmuir Limeworks	Industrial; Quarry; Limekiln	Post-medieval
9047	Whiteholm	Cist	Undated

[10] These works were undertaken in 1995, 1998, 1999, 2011, and 2012 (WoSAS Event ID: 904, 929, 177, 4738, and 4875).

HER Reference	Asset Name	Asset Type	Period
9045	Dornal Moat	Earthwork	Undated/Natural
66241	Hillhead	Farmstead	Post-medieval
66242	Back o'Hill	Farmstead	Medieval to Post-medieval
61695	Laigh Glenmuir	Schoolhouse	Modern

5.2.1.2 Assets outwith the Site Boundary

Within 10 km of the proposed turbine layout there are 152 designated heritage assets (shown on **Figure 5.1**), comprising the following:

- Eight Scheduled Monuments;
- 138 Listed Buildings;
    - Nine Category A
    - 65 Category B
    - 64 Category C
- One Inventoried Garden and Designated Landscape; and
- Five Conservation Areas.

There are no Inventoried Battlefields or World Heritage Sites within 10 km of the proposed turbine locations.

5.3 Potential Sources of Impact

5.3.1 Potential Sources of Impact within the Site boundary

The 21 non-designated recorded assets recorded within the Site boundary (**Table 5.1**) will be confirmed via a full commercial HER search ahead of the walkover survey. Whilst positioned outside of the current placement of the turbines, these known cultural heritage assets may be susceptible to a high level of direct or indirect impact as a result of the construction of the associated infrastructure (e.g. internal access tracks, substation) and any design changes will need to take into consideration the location of these assets to avoid any potential direct impacts on the heritage assets as far as possible.

Furthermore, there is the potential for direct impact on any unrecorded cultural heritage assets within the Site as a result of the construction process. A targeted site walkover is proposed, to visit the locations of the proposed turbines and other associated infrastructure and inspect for any visible unrecorded assets. The potential for impact on unrecorded cultural heritage assets will be assessed within the chapter.

Relevant mitigation measures will be embedded within the design of the Proposed Development as design progresses. Potential mitigation is discussed in **Section 5.4.4**.

If there are any further ground-breaking works undertaken during operation of the wind farm (e.g., track widening), then there is the potential for further impact on recorded or unrecorded heritage assets. If this is the case, then further mitigation methods may be required.

5.3.2 Potential Sources of Impact outwith the Site boundary

Direct impacts to an asset's setting are most likely to occur as part of the construction and operational phases of development.

The preliminary list of designated assets that are within the scope of assessment and within 10 km of each proposed turbine of Scoping Layout were subject to an initial appraisal (**Appendix B**). No designated heritage assets with long-distance views as part of their setting were identified beyond 10 km of the Proposed Development.

The appraisals are intended to create a proportionate scope for the assessment, and each asset will be subject to repeated appraisals throughout the EIA process, subject to changes to the proposed turbine layout. Assets that have been scoped in may be scoped out and vice versa, dependent on the final layout and as a result of consultee comments.

All designated cultural heritage assets within 10 km of each Scoping Layout, along with the ZTV indicating their visibility of the proposed turbines, are depicted on **Figure 5.1**.

Following the appraisal of assets set out in **Appendix B**, eight designated cultural heritage assets have been identified as requiring a detailed settings assessment within the EIA Report, as there is the potential for the Proposed Development to have a significant effect upon them.

The assets scoped in for further assessment within the EIA Report after the initial heritage appraisal are outlined in **Table 5.2**. Furthermore, the locations of visualisations are proposed in **Table 5.2**. If any viewpoints cannot be accessed and photos cannot be taken, wirelines will be produced. These visualisation locations are approximate, and final locations will depend on access and visibility of the final layout of the Proposed Development. Any changes in visualisation locations will be communicated to the appropriate consultees. The visualisations will include the developments considered for cumulative assessment.

Table 5.2: Assets Scoped In for Further Assessment due to Potential Impacts

Asset Reference	Asset Name	Type of Asset	Proposed Visualisation Location
SM3311	Kyle Castle,200 m E of Dalblair	Scheduled Monument	A photomontage will be produced from NS 64731 19209
SM4631	Cairn Table, two cairns	Scheduled Monument	A photomontage will be produced from NS 72464 24231, which shows the view from the eastern most cairn looking towards the western most cairn.
LB14413	Dumfries House	Category A Listed Building	A photomontage will be produced from the south of the asset at NS 54154 20340.
LB96	The Temple, In Policies Of Dumfries House.	Category A Listed Building	A wireline will be produced from NS 53798 20643
LB14414	Avenue Bridge, Dumfries House Policies	Category A Listed Building	A wireline will be produced from NS 53908 2138s
LB14416	Dovecote Dumfries House	Category A Listed Building	A wireline will be produced from NS 53951 20350.
GDL00149	Dumfries House	Inventoried Garden and Designed Landscape	A photomontage will be produced from NS 54216 20394, at the western edge of the no longer extant historic avenue through Shaw Wood.

Asset Reference	Asset Name	Type of Asset	Proposed Visualisation Location
LB14273	Sorn Castle	Category A Listed Building	A photomontage will be produced from NS 54779 26937, to the northwest of the asset.

5.4 Method of Assessment and Reporting

5.4.1 Proposed Sources

The sources to be consulted in the production of the EIA chapter include, but are not limited to, those outlined in **Table 5.3**.

Table 5.3: Proposed Cultural Heritage Sources to be Consulted

Subject	Author Summary	Source
Designated Cultural Heritage Assets	The database of HES	HES digital data download.
Conservation Areas	EAC and HES	HES digital data download, Conservation Area Appraisal from EAC
Non-designated cultural heritage assets (Local HER)	Data held by the West of Scotland Archaeology Service (WoSAS) and EAC	Digital data purchased from WoSAS and EAC as a download
Non-designated cultural heritage assets (National database)	Trove online database curated by HES	Trove Online Database
Historic Mapping	National Library of Scotland	National Library of Scotland website
LiDAR Data – Publicly Available	Scottish Government	Scottish Remote Sensing Portal
Unpublished reports	Various	Various
Published works of synthesis	Various	Various
Aerial Photography	HES	HES database Trove Online Database and National Collection of Aerial Photography (NCAP) (online)
Historic Land Use Assessment	HES	HES digital data download

5.4.2 Study Area

For the assessment, a Study Area (**Figure 5.1**) of 10 km from the location of the proposed turbines has been defined. There is no guidance defining what the extent of an appropriate ‘study area’ should be for the archaeological and cultural heritage assessment of wind farms. The proposed Study Area, therefore, represents an exercise in professional judgement, using the Zone of Theoretical Visibility (ZTV) and the scale of the development, and will be refined to a point of agreement between stakeholders during consultation.

Assets recorded within the Site and 1 km of the Site boundary will be analysed to inform the archaeological potential of the Site.

5.4.3 Scope of the Assessment

5.4.3.1 Assets within the Site

All cultural heritage assets within the Site boundary will be assessed in order to determine any direct and indirect impacts. Should WoSAS identify any non-designated assets that they consider to be of national/regional significance, and which they consider to derive cultural significance from their setting, these would be made known to the Applicant via consultation.

5.4.3.2 Assets outwith the Site

All nationally significant designated assets within the 10 km Study Area, and all regionally significant designated assets within 5 km, have been subject to an initial setting assessment in order to determine any potential impacts (**Appendix B**). Assets considered to be of national importance by WoSAS and EAC, including non-inventoried designed landscapes, will be subject to an appraisal and considered for further assessment once HER data has been obtained. A final scope of assets that have the potential for significant effects as a result of the Proposed Development will be agreed with the relevant consultees and assessed in full within the EIA Report.

5.4.3.3 Consultation

Based on the results of the baseline study, constraint mapping, using GIS software, shows mapped heritage assets in relation to a ZTV (**Figure 5.1**). This filters out those assets that do not require further assessment. These figures are provided to identify and agree on the most potentially sensitive assets which may then require computer-generated visualisations to be produced as part of their assessment. Consultees (including HES, WoSAS and EAC) are invited to comment on the current scope of assets to be assessed in the EIA.

HES is also invited to comment in relation to the method of assessment employed in assessing those heritage assets within their remit; these include Scheduled Monuments, Category A Listed Buildings, Inventoried Gardens and Designed Landscapes (GDLs), and Inventoried Battlefields.

WoSAS and EAC is invited to comment in relation to non-designated heritage assets and designated heritage assets of regional significance, and any non-designated assets which they consider to be of higher significance.

Additional follow up consultation, post-scoping, will be undertaken as required with HES, WoSAS and EAC to agree on the scope of assessment for the final design layout of the Proposed Development.

5.4.3.4 Field Surveys

A targeted Site inspection will be carried out in relation to all recorded assets within the Site boundary; the aim of this would be to establish the condition of any recorded assets and identify the potential for any additional presently unrecorded assets. This will also establish the presence/absence of assets identified **Table 5.1**.

Targeted field inspection of assets scoped in for further assessment will also be undertaken following a desk-based comparison of asset mapping with ZTV and satellite imagery. This survey will inspect any designated heritage assets potentially susceptible to impact from change to their setting a result of the Proposed Development.

5.4.3.5 Zone of Theoretical Visibility

The setting impact assessment will be assisted by the ZTV[11] as presented on **Figure 5.1**. The ZTV is based upon the maximum level of theoretical visibility, i.e. the maximum height of the turbine blade tips.

5.4.3.6 Assessment and Types of Impact

Impacts have the potential to be caused by the Proposed Development where it changes the baseline condition of either the asset itself or its setting; it being noted that change does not necessarily result in a negative impact.

In accordance with best practice EIA guidance[12], the cultural heritage assessment will identify impacts and effects as either direct or indirect, adverse or beneficial, and short-term, long-term or permanent. The definition of impact is described below:

- Direct impacts (physical) occur where the physical fabric of the asset is removed or damaged, or where it is preserved or conserved, as a direct result of the Proposed Development. Such impacts are most likely to occur during the construction phase and are most likely to be permanent.
- Indirect (physical) impacts are those which would affect the heritage significance of an asset by causing change to its fabric indirectly, such as increased pollution or changes in water draining patterns which can indirectly affect the preservation of heritage materials.
- Direct setting impacts result from the Proposed Development causing change within the setting of a heritage asset that affects its cultural significance or the way in which it is understood, appreciated, and experienced. Such impacts are generally, but not exclusively, visual, occurring directly as a result of the appearance of the Proposed Development in the surroundings of the asset. Setting impacts may also relate to other senses or factors, such as noise, odour or emissions, or historical relationships that do not relate entirely to intervisibility, such as historic patterns of land-use and related historic features. Such impacts may occur at any stage of a Proposed Development's lifespan and may be permanent, reversible, or temporary.
- Cumulative impacts: can relate to the physical fabric or setting of assets. They may arise as a result of impact interactions, either of different impacts of the Proposed Development itself, or additive impacts resulting from incremental changes caused by the Proposed Development together with other projects already in the planning system or allocated in a Local Development Plan.

Assessment will be undertaken separately for direct physical impact, indirect impact and direct setting impacts and will consider the level of their heritage significance (where known) and the magnitude (extent) of the identified impacts.

Potential impacts on cultural heritage assets will be identified and assessed with reference to guidance set out by NatureScot and HES[13] and HES[14], specifically HEP3 and HEP4. Assessment will be carried out in the following stages:

[11] A ZTV shows the predicted degree of visibility of a proposed development from all points within a proportionate, defined study area around the Site, as would be seen from an average observer's eye level (2m above ground level)

[12] NatureScot and HES. (2018) Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment Process in Scotland.

[13] ibid

[14] Historic Environment Scotland. (2019a) Historic Environment Policy for Scotland

- initial consideration of intervisibility and other factors leading to the identification of potentially affected assets;
- assessment of the cultural heritage significance of potentially affected assets;
- assessment of the contribution of setting to the cultural heritage significance of those assets;
- assessment of the extent to which change to any contributing aspects of the settings of those assets, as a result of the Proposed Development, would affect their cultural heritage significance (magnitude of change); and
- determination of the significance of any identified effects.

Assessment on the potential impacts on the setting of cultural heritage assets will be carried out following the three-stage approach outlined in Managing Change in the Historic Environment: Setting[15]:

- Stage 1: identify the historic assets that might be affected by the Proposed Development;
- Stage 2: define and analyse the setting by establishing how the surroundings contribute to the ways in which the historic asset or place is understood, appreciated and experienced; and
- Stage 3: evaluate the potential impact of the proposed changes on the setting, and the extent to which any negative impacts can be mitigated.

5.4.3.7 Cultural Heritage Significance

The categories of cultural heritage significance to be referred to are presented in **Table 5.4**, which will act as an aid to consistency in the exercise of professional judgement and provide a degree of transparency for others in evaluating the conclusions drawn.

The significance categories consider factors such as designation, status and grading. For non-designated assets, consideration will be given to their inherent heritage interests, intrinsic, contextual, and associative characteristics. In relation to these assets, the assessment will focus upon an assessment of the assets' inherent capability to contribute to our understanding of the past; the character of their structural, decorative and field characteristics as informed by the HER and Trove (HES) records and / or site visit observations; the contribution of an asset to their class of monument, or the diminution of that class should an asset be lost; and how a site relates to people, practices, events, and/or historical or social movements. Assessments of the cultural significance of specific assets, where recorded within the HER, will be considered where appropriate.

Table 5.4: Cultural Heritage Significance

Cultural Heritage Significance	Example
Very High	Sites of international importance, including World Heritage sites.
High	Site of National importance, including: Scheduled Monuments; Category A Listed Buildings; Gardens and Designed Landscapes included on the national inventory;

[15] Historic Environment Scotland. (2020) Managing Change in the Historic Environment

Cultural Heritage Significance	Example
	Designated Battlefields Conservation areas containing nationally important buildings; and Non-designated assets of equivalent significance.
Medium	Sites of Regional/local importance, including: Category B and C Listed Buildings; Conservation Areas containing buildings that contribute significantly to its character; and Non-designated assets of equivalent significance.
Low	Assets of local importance Heritage assets compromised by poor preservation and/or poor survival of contextual associations or with little of the asset remaining to justify a higher importance.
Negligible	Assets that are of very little or no heritage interest. Heritage assets where the ability to interpret their archaeological context has been removed/eroded.
Unknown	Further information is required to assess the significance of these assets.

In addition to identifying the significance of a heritage asset, it is essential, where changes to setting are being assessed, to understand the contribution that setting makes towards the significance of an asset. Elements of setting may make a positive, neutral or negative contribution to the significance of an asset. In determining the nature and level of effect upon an asset and its setting by the Proposed Development, the contribution that setting makes to an asset's significance, and thus its sensitivity to changes to its setting, need to be considered.

This approach recognises the importance of avoiding significant adverse effects on the integrity of the setting of an asset in the context of the contribution that setting makes to the understanding, appreciation and experience of an asset. It recognises that setting may be key in characterising, understanding and appreciating some, but not necessarily all, assets. Indeed, assets of High or Very High significance do not necessarily have High sensitivity to changes to their settings.

An asset's relative sensitivity to alterations to its setting refers to its capacity to retain its ability to contribute to an understanding and appreciation of the past in the face of changes to its setting. The ability of an asset's setting to contribute to an understanding, appreciation and experience of it and its significance also has a bearing on the sensitivity of that asset to changes to its setting.

While certain cultural heritage assets of High or Very High importance are likely to be sensitive to impacts, not all will have a similar sensitivity to impacts on their setting; this would be true where setting does not appreciably contribute to their significance. HES's guidance on setting makes clear that the level of effect may relate to "*the ability of the setting of an asset to absorb new development without eroding its key characteristics*"[16]. Assets with high relative sensitivity of setting may be vulnerable to any changes that affect their settings and even slight changes may erode their key characteristics or the ability of their settings to contribute to the understanding, appreciation or experience of them. Assets where relative sensitivity of setting

[16] Historic Environment Scotland. (2020) Managing Change in the Historic Environment

is lower may be able to accommodate greater changes to their settings without key characteristics being eroded.

The determination of an asset's relative sensitivity to changes to its setting is first and foremost reliant upon the determination of its setting and how setting aligns with other key characteristics which contribute to cultural significance. While cultural significance is defined by the criteria set out in **Table 5.4**, the sensitivity of setting criteria for each asset will be defined using professional judgement and, where appropriate, by a site visit conducted by the assessor. The resulting sensitivity of setting will then be defined and referenced within the assessment for use in applying professional judgement to determine whether the resulting effects are in line with policy.

5.4.3.8 Magnitude of Impact

Determining the magnitude of impact includes consideration of the nature of the activities proposed during the construction and operational phases of the Proposed Development. Activities could potentially include ground disturbance, and result in visual change, as well as noise, vibration, smell, dust, traffic movements etc. which could result in changes to setting.

Considering all embedded mitigation measures, which will be developed throughout the design process, the magnitude of impact will be assessed using professional judgement, with reference to the criteria set out in **Table 5.5**.

Table 5.5: Magnitude of Impact

Magnitude of Impact	Explanatory Criteria
High Beneficial	The Proposed Development would considerably enhance the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Medium Beneficial	The Proposed Development would enhance, to a clearly discernible extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Low Beneficial	The Proposed Development would enhance, to a minor extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Very Low Beneficial	The Proposed Development would enhance, to a very minor extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate, and experience it.
Neutral/None	The Proposed Development would not affect the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Very Low Adverse	The Proposed Development would erode, to a very minor extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect impact would not be considered to affect the integrity of the asset's setting.
Low Adverse	The Proposed Development would erode, to a minor extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect impact would rarely be considered to affect the integrity of the asset's setting.
Medium Adverse	The Proposed Development would erode, to a clearly discernible extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect impact might be considered to affect the integrity of the asset's setting.

Magnitude of Impact	Explanatory Criteria
High Adverse	The Proposed Development would considerably erode the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect impact would probably be considered to affect the integrity of the asset's setting.

5.4.3.9 Significance of Effect

Table 5.6 provides a matrix that relates the cultural significance of the asset to the magnitude of impact on its cultural significance, to produce an overall anticipated level of effect (significance of effect). Effects may be beneficial or adverse, and may be short term, long term or permanent.

Table 5.6: Significance of Effect Matrix

Magnitude of Impact	Cultural Significance (Excluding Unknown)					
	Highest	High	Medium	Low	Negligible	Highest
High beneficial	Major	Major	Moderate	Minor	Very Minor	Major
Medium beneficial	Major	Moderate	Minor	Very Minor	Negligible	Major
Low beneficial	Moderate	Minor	Very Minor	Very Minor	Negligible	Moderate
Very low beneficial	Minor	Very Minor	Negligible	Negligible	Negligible	Minor
Neutral/None	Neutral/Nil	Neutral/Nil	Neutral/Nil	Neutral/Nil	Neutral/Nil	Neutral/Nil
Very low adverse	Minor	Very Minor	Negligible	Negligible	Negligible	Minor
Low adverse	Moderate	Minor	Very Minor	Very Minor	Negligible	Moderate
Medium adverse	Major	Moderate	Minor	Very Minor	Negligible	Major
High adverse	Major	Major	Moderate	Minor	Very Minor	Major

Once the anticipated effects of the Proposed Development upon cultural heritage assets are defined, professional judgement will be used to determine whether those effects would be either 'significant' or 'not significant' for the purposes of EIA. As part of this determination process, regard will be given to any relevant guidance.

With reference to the matrix presented in **Table 5.6**:

- any effects identified as 'major' would most probably be considered 'significant;'
- any effects identified as 'moderate' might also be considered 'significant,' although professional judgement may determine otherwise on the basis of the associated site-/asset-specific detail; and
- any effects identified as 'minor' or less are unlikely to be considered 'significant,' though again, professional judgement will been exercised.

A clear statement will be made in relation to all affected assets as to whether the identified effects upon them are considered to be 'significant' or 'not significant' for purposes of the EIA.

5.4.3.10 NPF4

Scheduled Monuments

Policy 7h of NPF4 states that development proposals affecting scheduled monuments will only be supported where; "*significant adverse impacts on the integrity of the setting of a scheduled monument are avoided*."

A significant effect in EIA terms does not necessarily equate to a significant impact upon the integrity of setting. Where EIA defined significant effects are found, a detailed assessment of adverse impacts upon the integrity of the setting is made. Whilst non-significant effects are unlikely to significantly impact the integrity of the setting, the reverse is not always true. That is, the assessment of an effect as being significant in EIA terms does not necessarily mean that the adverse effect on the setting of the asset will significantly impact its integrity. Changes to factors of setting that contribute to cultural significance, such that the understanding, appreciation and experience of an asset are not adequately retained will have a significant adverse impact on the integrity of its setting.

Listed Buildings

Policy 7c of NPF4 states that development proposals affecting the setting of listed buildings should "*preserve its character, and its special architectural or historic interest*."

Inventory Gardens and Designed Landscapes

Policy 7i states that development proposals affectedly national important Gardens and Designed Landscapes will be supported where they "*protect, preserve, or enhance their cultural significance, character and integrity and where the proposals will not significantly impact on important views to, from and within the stie or its setting*."

5.4.4 Mitigation

Where adverse effects on cultural heritage assets are possible, the magnitude of impact can be reduced through measures to prevent, reduce and/or, where possible, offset these impacts. Suitable measures for reducing or removing any direct and indirect impacts will be embedded into the design of the Proposed Development where possible, and will be outlined within the EIA Report. Where avoidance of impacts through embedded measures is not possible, a programme of archaeological works will be designed and agreed with the relevant authorities and implemented.

Suitable measures for minimising impacts through ground disturbance might include:

- the micrositing of Proposed Development infrastructure away from sensitive locations;
- the fencing off or marking out of heritage assets or features in proximity to construction activity in order to avoid disturbance where possible;
- a programme of archaeological work where required, such as an archaeological watching brief during construction activities in or in proximity to areas of archaeological sensitivity, or excavation and recording where impact is unavoidable; and/or
- a working protocol to be implemented should unrecorded archaeological features be discovered.

Suitable measures for mitigating any setting impacts during the iterative design process might include:

- alteration of the proposed turbine layout;
- deletion or removal of turbines; and/or
- reduction of proposed turbine heights.

5.4.5 Cumulative Effects

Wind farms that are under construction when the assessment is undertaken are considered as part of the baseline environment for operational impact assessments. Any effect resulting from operational wind farms has been considered as part of the baseline setting of the asset.

Cumulative effects will be assessed in line with the guidance provided in the EIA Handbook[17]. A cumulative effect is considered to occur when there is a combination of:

- a significance of effect on an asset or group of assets due to changes resulting from the Proposed Development; and
- an impact on the same asset or group of assets resulting from other wind farm development (consented or proposed, but not operational) within the surrounding landscape.

Assets with a minor or higher significance of effect resulting from the Proposed Development in isolation will be considered for cumulative assessment, as these assets are most likely to be susceptible to significant cumulative effects.

Wind farm developments will be considered for cumulative impacts as follows:

- wind farm planning application within 15 km of an asset which have been submitted and have a decision pending; and
- wind farm planning applications within 15 km of an asset that have been granted permission but not yet constructed.

All wind farm developments considered as part of the cumulative assessment will be listed in full within the cultural heritage chapter of the EIA Report.

5.4.6 Residual Effects

Residual effects are those that remain even after the implementation of suitable mitigation measures. Residual effects will be identified, and the significance of those residual effects defined with reference to **Table 5.6**.

5.4.7 Matters Scoped Out

On the basis of the work undertaken to date, the professional judgement of the cultural heritage team, and experience of other comparable projects, it is considered that direct (setting), indirect, and cumulative impacts of the Proposed Development on Category C Listed Buildings can be scoped out of the EIA in relation to cultural heritage. As per best practice guidance within the EIA Handbook, Category C Listed Buildings are of local rather than national or regional importance, unless in the opinion of an assessor the importance should be higher.

Category B listed buildings located more than 5 km from the proposed turbines have been excluded from further assessment, as no assets of this type were found to be positioned where turbine views form part of their setting in a way that contributes to their significance or the ability to understand, appreciate, and experience them.

In most cases, the significance of a Conservation Area derives from its character and the assets that it contains, rather than the contribution of the wider landscape. As such, any conservation area outwith 5 km of the Site has been scoped out, with the justification that,

[17] NatureScot and HES. (2018) Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment Process in Scotland

even if visibility between the Proposed Development and the conservation areas may still occur, the conservation areas' significance would not be diminished.

It is also considered that any assets that fall outwith the ZTV (and where important views associated those assets' approaches and third points of appreciation also fall outwith the ZTV) can be scoped out of the EIA in relation to cultural heritage.

5.5 Summary

Cultural heritage assets both within the Site and outwith the Site will be considered for potential for direct, indirect, settings and cumulative impacts as a result of the Proposed Development.

In regard to direct and indirect impacts, mitigation will be embedded into the design of the Proposed Development, in order to avoid impact on known heritage assets. Furthermore, the potential for direct impacts on as yet unrecorded heritage assets will be considered within the EIA Report. If warranted, further mitigation will be agreed with WoSAS.

A high-level appraisal has been undertaken of the designated heritage assets within 10 km of the proposed turbines. This appraisal can be found in **Appendix B**. As a result of the appraisals, the assets scoped in for further assessment to be included within the EIA Report are as follows:

- Kyle Castle, 200 m E of Dalblair (SM3311);
- Cairn Table, two cairns (SM4631);
- Dumfries House (LB1441);
- The Temple, In Policies Of Dumfries House (LB96);
- Avenue Bridge, Dumfries House Policies (LB14414);
- Dovecote Dumfries House (LB14416);
- Dumfries House (GDL00149); and
- Sorn Castle (LB14273).

Furthermore, the potential for cumulative effects as a result of the Proposed Development on any sensitive heritage receptors will be considered.

5.6 Questions for Consultees

Q5.1 Do consultees agree with the methodology set out?

Q5.2 Do consultees agree with assets and matters scoped out?

Q5.3 Are there any assets, not listed in the appraisal, that key consideration should be given to?

Q5.4 Do consultees have any specifications on further visualisations and their locations?

6.0 Ecology

6.1 Introduction

This section sets out the proposed approach to assessing the likely significant effects of the Proposed Development on ecology during construction and operation. It also details the methods that have been and will be used to establish the baseline conditions within the Site and its surroundings, and the process to be used to determine the sensitivity of the habitats and species populations present. The assessment will be undertaken in accordance with legislation and best practice guidance.

6.2 Baseline Description

Baseline ecological conditions have been/will be established through a combination of the following desk-based sources and field surveys:

- a desk study to confirm the location and qualifying features of statutory designated sites[18], non-statutory designated sites[19] [20] and ancient woodland[21] within potential zones of influence of the Proposed Development;
- information from the Carbon and Peatland Map 2016[22];
- information from the National Biodiversity Network (NBN) Atlas[23] on ecological records within 5 km and 10 km[24] of the Site within the last 15 years (since 2010);
- information from the Deer Distribution Survey by the British Deer Society[25];
- information from the Saving Scotland's Red Squirrels (SSRS) website[26] for records of red and grey squirrel sightings;
- Environmental Statements (ES), EIA Reports or technical reports from other relevant developments or proposed developments in the local area;
- results of the ecological surveys undertaken for the Proposed Development between April and September 2025; and

[18] NatureScot (2025a). SiteLink. Available at: https://sitelink.nature.scot/home. [Accessed: 27 November 2025]

[19] East Ayrshire Council (2024). Local Development Plan 2. Local Nature Conservation Sites. Draft Non-statutory Planning Guidance. Available at: https://www.east-ayrshire.gov.uk/Resources/PDF/P/planning-nspg-local-nature-conservation-sites.pdf. [Accessed: 27 November 2025]

[20] Scottish Government (2025a). Local Nature Conservation Sites – Scotland. Available at: https://www.data.gov.uk/dataset/c3460656-74ab-435a-8f77-9a528e24beb1/local-nature-conservation-sites-scotland. [Accessed: 27 November 2025]

[21] Scottish Government (2025b). Ancient Woodland Inventory (Scotland). Available at: https://www.spatialdata.gov.scot/geonetwork/srv/api/records/A091F945-F744-4C8F-95B3-A09E6EF6AE33. [Accessed: 27 November 2025]

[22] Scottish Government (2025c). Scotland's Soils. Available at: https://map.environment.gov.scot/Soil_maps/?layer=10#. [Accessed: 27 November 2025]

[23] National Biodiversity Network Atlas Scotland (2025). Available at: https://scotland.nbnatlas.org/. [Accessed: 27 November 2025]

[24] 10 km applies to bat species only.

[25] British Deer Society (2023). Deer Distribution Survey. Available at: https://bds.org.uk/science-research/deer-surveys/deer-distribution-survey/. [Accessed: 27 November 2025]

[26] Scottish Squirrels (2025). Sightings of Red and Grey Squirrels across Scotland. Available at: https://scottishsquirrels.org.uk/squirrel-sightings/. [Accessed: 27 November 2025]

- results of the Phase I peat probing survey undertaken for the Proposed Development in October 2024 and additional forthcoming Phase II peat probing and peatland condition surveys (see **Chapter 8 Geology, Hydrogeology, Hydrology and Peat**).

6.2.1 Study Area

The ecology assessment will incorporate the following study areas:

- designated sites: the Site as a whole and a 5 km study area from the Site boundary (see **Figure 6.1**);
- protected species: the Site plus any species-specific buffers as necessary and as defined in guidance;
- electrofishing surveys: watercourses within the Site boundary and downstream as deemed relevant;
- potential bat roost features: the Site and a 200 m plus turbine blade length buffer (as per NatureScot et al., 2021);
- habitats and potential Groundwater Dependent Terrestrial Ecosystems (GWDTE): the Site;
- bat collisions: static bat data from fixed locations will be processed through the online Ecobat tool[27]; and
- cumulative assessment (if required): the Site and a 5 km study area from the Site boundary.

6.2.2 Desk Study

6.2.2.1 Designated Sites

There are no statutory designated sites with ecological (non-avian) qualifying interests within the Site. There are two statutory designated sites with ecological (non-avian) qualifying interests within 5 km of the Site boundary: Muirkirk Uplands Site of Special Scientific Interest (SSSI) is located on the Site boundary in the northeast of the Site; and Airds Moss Special Area of Conservation (SAC) is north/northwest of the Site boundary[28] (see **Figure 6.1** and **Table 6.1**).

There are two non-statutory Local Nature Conservation Sites (LNCS) within/overlapping with the Site: Low Moss LNCS and Glenmuir Water: Lugar to Kyle Castle LNCS; and numerous within 5 km of the Site[29] [30] (**Figure 6.1** and **Table 6.2**).

[27] The Mammal Society (2017). Ecobat. Available at: https://mammal.org.uk/blog/2017/12/making-sense-of-clicks-and-squeaks-mammal-society-launches-ecobat. [Accessed: 27 November 2025]

[28] NatureScot (2025a). SiteLink. Available at: https://sitelink.nature.scot/home. [Accessed: 27 November 2025]

[29] East Ayrshire Council (2024). Local Development Plan 2. Local Nature Conservation Sites. Draft Non-statutory Planning Guidance. Available at: https://www.east-ayrshire.gov.uk/Resources/PDF/P/planning-nspg-local-nature-conservation-sites.pdf. [Accessed: 27 November 2025]

[30] Scottish Government (2025a). Local Nature Conservation Sites – Scotland. Available at: https://www.data.gov.uk/dataset/c3460656-74ab-435a-8f77-9a528e24beb1/local-nature-conservation-sites-scotland. [Accessed: 27 November 2025]

Table 6.1: Statutory Designated Sites within 5 km of the Site

Designated Site	Qualifying Features	Distance from Site Boundary (km)	Condition (and Date of Assessment)
Muirkirk Uplands SSSI	Upland habitat assemblage	0	Favourable maintained (2 June 2009)
	Blanket bog		Unfavourable, no change (6 October 2009)
Airds Moss Special SAC	Blanket bog	0.44	Unfavourable, no change (11 October 2018)

Table 6.2: Non-Statutory Designated Sites (LNCS) within 5 km of the Site

LNCS	Distance from Site Boundary (km)	Description
Low Moss LNCS	Overlaps with western Site boundary	Primary habitat type: mires and heaths Interest: habitat This site comprises an area of upland habitats of raised bog and grassland. Surrounding land uses comprise of areas of agricultural fields, areas of scrub and woodland. Glenmuir Water: Lugar to Kyle Castle LNCS is located in the west.
Glenmuir Water: Lugar to Kyle Castle LNCS	Overlaps with south-western Site boundary	Primary habitat type: woodland and scrub Interest: habitat The Site broadly follows the Glenmuir Water and associated woodlands and grasslands. The Site overlaps with Lugar Water: Holmhead to Braehead LNCS in the north, and immediately borders Muirkirk South Uplands SSSI.
Guelt LNCS	0.28 south	Primary habitat type: grasslands Interest: habitat This site is comprised of grassland and scrub, with a minor road running along the west and south boundary. Glenmuir Water: Lugar to Kyle Castle LNCS is located to the north, and Muirkirk Uplands SSSI to the south. Protected species could occur either within or in close proximity to site.
Lugar Water: Holmhead to Braehead LNCS	1.02 west	Primary habitat type: woodland and scrub Interest: habitat This site is comprised of woodland, scrub, scattered trees and large areas of grassland of various uses. Several man-made features are present within this site. A proportion of the Site overlaps with woodland listed on the Ancient Woodland Inventory (AWI).
Lugar Loch Wetlands LNCS	1.91 west	Primary habitat type: woodland and scrub: wetlands Interest: habitat This site comprises a mosaic of grassland habitats, with a woodland in the south and four waterbodies of varying

LNCS	Distance from Site Boundary (km)	Description
		sizes in the centre. Waterbodies are connected by Craigston Burn. Open water, swamp, mire, semi-improved grassland and scrub habitats are present. This site overlaps with woodland listed on the AWI.
River Ayr: Mid Heilar to Chapelhouse LNCS	2.35 north	Primary habitat type: woodland and scrub Interest: habitat This site predominantly comprises the River Ayr and surrounding natural broadleaf woodlands and neutral, marshy and improved grasslands. Many native and naturalised species of tree present throughout the woodlands, such as beech, silver birch, sycamore, oak, hawthorn, ash, willow, Scots pine, alder, holly, elm, hazel and rowan.
Crook Moss LNCS	2.65 north	Primary habitat type: composite/blanket bog Interest: habitat Similar vegetation types to the adjacent Muirkirk Uplands SSSI, including a peat bog known as Crook Moss, wet heath known as Lammerlaugh Muir and acid grassland. This area was assessed and considered to merit a Wildlife Site at the time of the last review which was undertaken by East Ayrshire Council in conjunction with Scottish Wildlife Trust in 1982.
River Ayr Floodplain LNCS	3.25 north-east	Primary habitat type: wetlands Interest: habitat This site comprises the River Ayr, a small section of Garpel Water which is a tributary of the River Ayr, and surrounding grasslands and woodlands. This site lies within a B-Line and a proportion of this site overlaps with woodland listed on the AWI.
Marchhouse Hill LNCS	3.36 north-east	Primary habitat type: mires and heaths Interest: habitat This site includes two large areas of wet modified bog which grades through acid grassland to marshy grassland downhill and to the south of the Site. Short, well-grazed ling heather dominated the wet modified bog habitats, with wavy hair grass, tormentil, blaeberry, cross leaved heather, hairs tail cottongrass, deer grass, purple moor-grass and lichen also present within these bogs.
Ryderston Belt LNCS	3.42 south-west	Primary habitat type: grasslands Interest: habitat This site runs alongside Loganhill Road and a railway line and is 750 m from Glaisnock Glen / Velvetere Wood LNCS comprising a mixture of scrub and trees along the river. Surrounding land uses include agricultural farmland, Knockshinnoch Lagoons LNCS, rail lines, pockets of broadleaf woodland.

LNCS	Distance from Site Boundary (km)	Description
Glaisnock Glen / Velvetere Wood LNCS	4.37 south-west	Primary habitat type: woodland and scrub Interest: habitat This site is comprised of natural and planted woodland and grasslands. A proportion of the Site overlaps with woodland listed on the AWI, however this site was not selected for a site survey.
Darconner LNCS	3.43 west	No detailed information available[31]. Associated with Shaw Hill LNCS, which is immediately north of this site.
Shaw Hill LNCS	3.46 north-west	Primary habitat type: composite/blanket bog Interest: habitat The Site is located immediately to the northwest and west of Airds Moss SAC, as well as immediately to the north of Darconner LNCS and in close proximity to River Ayr: Damhead to Nether Heilar LNCS. As such, the Site forms part of a strong habitat network/nature network.
Mansfield Burn LNCS	4.10 south	Primary habitat type: woodland and scrub Interest: habitat The Site consists of a watercourse surrounded by scrub and woodland, which in turn is surrounded by grassland. Mansfield Burn flows through the Site, a tributary of the Nith River. A proportion of the Site overlaps with woodland listed on the AWI.
River Ayr: Damhead to Nether Heilar LNCS	4.69 north-west	Primary habitat type: woodland and scrub Interest: habitat A large portion of the Site overlaps woodland listed on the AWI. This site predominantly comprises the River Ayr and surrounding natural broadleaf woodlands. Beech was generally the most common species, with many other native and naturalised species present throughout the woodlands, such as silver birch, sycamore, oak, elm, ash, Sitka spruce, yew, hazel, lime and rowan.
New Cumnock Wetlands LNCS	4.72 south	Primary habitat type: wetlands Interest: habitat This site comprises a mosaic of grassland habitats, with a woodland in the south and four waterbodies of varying sizes in the centre. These waterbodies are connected by the Craigston Burn. This site comprises a mosaic of largely open grassland habitats, with several open waterbodies. Seggy Burn flows down the site. Protected species likely occurring within or in close proximity to the Site.

[31] Little information is available on these LNCS. It is proposed that the Local Authority be consulted with to determine the LNCS' qualifying or protected features and status.

6.2.2.2 Ancient Woodland

There are six areas of ancient woodland listed on the AWI within or overlapping with the Site (Scottish Government, 2025b), located in the north and south of the Site. The closest area of ancient woodland to any proposed new infrastructure is 75 m west of a section of proposed new access track. However, no ancient woodland would be lost due to the Proposed Development. All other turbines/tracks are located over 200 m from ancient woodland. These areas are classified as being either Long-Established (of plantation origin) or Ancient (of semi-natural origin). There are numerous areas of ancient woodland within 5 km of the Site (**Figure 6.1**).

6.2.2.3 NBN Atlas Scotland

A search of the NBN Atlas Scotland returned records of the following protected or notable species within 5 km of the Site in the last 15 years (since 2010)[32]:

- adder (*Vipera berus*);
- Atlantic salmon (*Salmo salar*);
- brown hare (*Lepus europaeus*);
- brown/sea trout (*Salmo trutta*);
- common lizard (*Zootoca vivipara*);
- European eel (*Anguilla anguilla*);
- otter (*Lutra lutra*);
- palmate newt (*Lissotriton helveticus*); and
- red squirrel (*Sciurus vulgaris*).

The above search was expanded out to 10 km for bat species, and returned the following species:

- common pipistrelle (*Pipistrellus pipistrellus*);
- Daubenton's bat (*Myotis daubentonii*);
- Leisler's bat (*Nyctalus leisleri*);
- Natterer's bat (*Myotis nattereri*); and
- soprano pipistrelle (*Pipistrellus pygmaeus*).

The invasive non-native species (INNS) grey squirrel (*Sciurus carolinensis*) was also recorded within the 5 km search parameters.

6.2.2.4 Red Squirrel

The SSRS sightings portal[33] has records of grey squirrel sightings within 5 km of the Site from 2013 to 2015 and 2018 to 2025, and red squirrels within 5 km of Site in 2018 and from 2022 to 2024.

[32] References to all records will be provided in the EIA Report and can be provided at this stage if required.

[33] Scottish Squirrels (2025). Sightings of Red and Grey Squirrels across Scotland. Available at: https://scottishsquirrels.org.uk/squirrel-sightings/. [Accessed: 27 November 2025]

The southwest of the Site intersects with a Priority Area for Red Squirrel Conservation (PARC)[34].

6.2.2.5 Deer

The Deer Distribution Survey[35] results suggest the likely presence of roe deer (*Capreolus capreolus*), red deer (*Cervus elaphus*), fallow deer (*Dama dama*) and sika deer (*Cervus nippon*) within the general area of the Site.

6.2.2.6 Carbon Peatland Map 2016

As shown on **Figure 8.1**, the Carbon and Peatland Map 2016 shows that the Site comprises mainly Class 0 Mineral Soil[36] with a band of Class 5[37] soils across the centre and smaller areas in the north and west. There is a small area of Class 1[38] peatland in the southwest of the Site, which has been avoided by the Proposed Development (**Figure 8.1**). There are no areas of Class 2 peatland within the Site.

Habitat and peat depth surveys undertaken for the Proposed Development take precedence over the Carbon Peatland Map information and provide further detailed Site-specific information relating to Site vegetation and soils (see **Section 6.2.3.1** and **Chapter 8: Geology, Hydrogeology, Hydrology and Peat**).

6.2.3 Field Surveys

6.2.3.1 Habitat Surveys

National Vegetation Classification (NVC) surveys incorporating Phase 1 Habitat characterisation and potential GWDTE habitat classification were undertaken in July 2025. The survey area focussed on an area larger than the Site, including areas of previous interest.

The habitat survey results are shown on **Figures 6.2.1-6.2.6**[39], and show that the majority of the Site is made up of improved grassland (B4) in the south of the Site, with scattered areas of marshy grassland (B5). Other habitats are mixed and more limited and fragmented in extent, including wet modified bog (E1.7), blanket bog (E1.6.1) and conifer plantation (A1.2.2) amongst several other habitats and mosaics (**Figures 6.2.1-6.2.6**). Many areas are disturbed and degraded reflecting the Site's mining legacy and limited restoration since. One area within the centre of Site could not be surveyed due to health and safety access restrictions; however, this area is a historic open mine cast void (as can be seen on aerial imagery) and is unlikely to contain habitats of local or national interest.

Areas of potential GWDTE were found across the majority of the survey area based on the NVC survey results. A GWDTE assessment will be conducted as part of the Geology, Hydrogeology, Hydrology and Peat chapter of the EIA Report (see **Chapter 8**).

[34] Forestry and Land Scotland (2025). SSRS Priority Areas for Red Squirrel Conservation (PARC) Dataset

[35] British Deer Society (2023). Deer Distribution Survey. Available at: https://bds.org.uk/science-research/deer-surveys/deer-distribution-survey/. [Accessed: 27 November 2025]

[36] Class 0: Mineral Soil.

[37] Class 5: Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat.

[38] Class 1: Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value.

[39] For further details of the Phase 1 habitat codes presented on Figure 8.2, refer to JNCC (2010). Handbook for Phase 1 habitat survey – a technique for environmental audit, JNCC, Peterborough, ISBN 0 86139 636 7.

6.2.3.2 Protected Species Survey

Protected species surveys were conducted in August 2025 and recorded evidence of otter and the potential presence of water vole (*Arvicola amphibius*)[40]. Three otter spraints and two mammal holes potentially suitable for water vole were recorded in the north of Site. No other field signs of either species were identified. No protected features were recorded for any protected species.

One abandoned farm building with potential roost features (PRFs) for bats was identified within the Site during surveys, where many holes with roosting potential and entry/exit points were identified within the building. A number of bat boxes were also identified within the Site in the west. The closest proposed turbine to a PRF is over 400 m distant, southwest of the proposed T6.

Seasonal static bat detector (Anabat) surveys were undertaken between April and September 2025, over three deployments in accordance with NatureScot et al. guidance[41]. Thirteen Anabat detectors were deployed across the Site, with locations selected based on the indicative layout provided at the time of survey commencement and positioned to cover the area in which the turbines were proposed to be located. Full results and analysis of the static bat detector data will be presented in the EIA Report.

6.2.3.3 Fish Surveys

Electrofishing and fish habitat suitability surveys for the Proposed Development were undertaken by Ayrshire Rivers Trust (ART) at watercourses within and at catchments draining the Site in July and August 2025. Survey results will be presented and considered in preparation of the EIA Report.

6.3 Potential Sources of Impact

The assessment will consider the potential impacts associated with construction and operation of the Proposed Development, with a focus on those which could be significant.

Construction impacts that will be considered include:

- temporary and permanent habitat loss/alteration/fragmentation/drainage associated with the Proposed Development infrastructure;
- pollution impacts on watercourses and aquatic fauna within the Site;
- loss of shelter, breeding or foraging habitat for identified protected species;
- displacement of deer;
- risk of injury or death to protected species from collisions with increased construction traffic; and
- visual and noise disturbance to protected species associated with construction activities.

Operational Impacts that will be considered include:

- displacement of protected species from shelter, breeding or foraging habitats around operational turbines and other permanent infrastructure, including barrier effects;

[40] Evidence of water vole can only be confirmed through the presence of droppings and/or vegetation cuttings; therefore, water vole presence has not been confirmed at the Site.

[41] NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019, with minor updates 2021). Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation

- risks of bats colliding with or suffering barotrauma from proximity to operational wind turbine blades; and
- habitat restoration/enhancement to be delivered as part of the Proposed Development's Biodiversity Enhancement Management Plan (BEMP).

Where appropriate, these construction and operational effects will also be considered in a cumulative assessment.

6.4 Method of Assessment

6.4.1 Assessment Methodologies

The EIA Report will include an Ecological Impact Assessment (EcIA). This will consider the potential direct, indirect and cumulative impacts that the construction and operation phases of the Proposed Development could have on Important Ecological Features (IEFs), as per CIEEM guidance[42]. The assessment will be supported by appendices that will include details of survey methodologies and all survey data.

An assessment of relevant cumulative impacts will be undertaken following published guidance. Where it is determined that a cumulative assessment is necessary, impacts will be assessed in combination with other relevant projects subject to the EIA process within 5 km, and their effects on a relevant reference population; for example, at a watercourse, watershed or Natural Heritage Zone (NHZ) level.

The assessment will include the following elements:

- baseline conditions;
- scoping of ecological features and impacts in/out of detailed assessment;
- an assessment of potential impacts and effects on IEFs during construction and operation;
- as assessment of cumulative effects;
- an outline of any required mitigation; and
- a summary of significant residual effects.

Effects on IEFs will be assessed in relation to the species' reference population or habitat extent, conservation status, range and distribution. The assessment of potential effects will be informed by guidelines published by CIEEM and NatureScot.

The assessment involves the following process:

- identifying potential impacts of the Proposed Development;
- considering the likelihood of occurrence of potential impacts;
- defining the nature conservation value and conservation status of relevant populations for each IEF to determine overall sensitivity;
- establishing the magnitude of the likely impact (both spatial and temporal) on each IEF);
- based on the above information, making a judgement as to whether or not the resultant effect would be significant in terms of the EIA Regulations;

[42] CIEEM (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester

- where a potential effect is deemed to be significant, measures to avoid, reduce, mitigate or compensate for the effect are suggested, where required;
- considering opportunities for enhancement, where appropriate; and
- determining residual effects following mitigation (including enhancement), and, where residual effects are assessed as remaining significant, considering appropriate proposals for compensation.

Determination of the level of sensitivity of an IEF is based on a combination of the feature's nature conservation value, defined on the basis of the geographic scale and conservation status, based on its distribution and/or population trend.

The magnitude of potential effects will be identified by considering the degree of change to baseline conditions predicted as a result of the Proposed Development, how IEFs are likely to respond to the Proposed Development, the duration and reversibility of an effect, best practice guidance and legislation, and professional judgement. Effects are judged in terms of magnitude in space and time, and effects can be beneficial, neutral or adverse.

The significance of potential effects is determined by integrating the assessments of IEF sensitivity and magnitude of effect in a reasoned way, based on the available evidence and professional judgement.

A set of pre-defined significance criteria will be used in assessing the potential effects of the Proposed Development to establish whether there will be any effects which will be sufficient to adversely affect the IEF to the extent that its conservation status deteriorates above and beyond that which would be expected should baseline conditions remain (i.e., the 'do nothing' scenario).

6.5 Approach to Mitigation

6.5.1 Design Considerations

Where possible, significant impacts on ecological features will be avoided or minimised through the design process. Such considerations will include but are not limited to:

- avoidance of statutory and non-statutory designated sites;
- avoidance of Class 1 peatland when locating turbines and other infrastructure;
- avoidance of active blanket bog habitat and GWDTEs when locating turbines and other infrastructure insofar as practicable;
- maintenance of a buffer from turbines to forest edge habitats or key linear features to ensure a minimum 50 m buffer from turbine blade tip to feature height for all turbines, as recommended by NatureScot et al.[43] in relation to bats;
- maintaining buffers between infrastructure and any protected species protected features in line with appropriate guidance;
- maintaining a 50 m buffer between infrastructure and any watercourses, except where watercourse crossings are required (to be kept to a minimum); and
- design of the track length and alignment to reduce the extent of track where practicable and maximise use of existing tracks where possible.

[43] NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019, with minor updates 2021). Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation

The scoping layout takes into account the above considerations, where appropriate.

6.5.2 Good Practice

The following good practice mitigation measures are assumed to be in place for the purposes of the assessment:

- a Species Protection Plan (SPP) will be implemented as part of a Construction Environmental Management Plan (CEMP) during the construction phase to ensure that all reasonable precautions are taken to adhere to the relevant wildlife legislation;
- pre-construction and during-construction surveys will be undertaken by an Ecological Clerk of Works (ECoW), or suitably qualified ecologist, as part of the SPP. An ECoW will be present throughout the construction period; and
- a robust, Site-specific CEMP will be implemented. This will set out how the Principal Contractor will manage the works in accordance with the commitments and mitigation measures detailed in the EIA Report, the SPP, statutory consents and authorisations, and industry good practice and guidance for environmental management, including appropriate pollution prevention measures, particularly in relation to watercourses.

6.6 Potential Significant Effects

6.6.1 Potential Effects Scoped In to the Assessment

There is potential connectivity between the Proposed Development and Muirkirk Uplands SSSI as part of the Site shares the western boundary of this SSSI (**Figure 6.1**). As such, Muirkirk Uplands SSSI will be given further consideration as the Site layout evolves, with the potential for it to be scoped into detailed assessment at the EIA stage.

There is potential connectivity between the Proposed Development and Low Moss LNCS and Glenmuir Water: Lugar to Kyle Castle LNCS (**Figure 6.1**). As such, these will be given further consideration as the Site layout evolves, with the potential for them to be scoped into detailed assessment at the EIA stage.

Effects on priority peatland and Annex I habitats under the Habitats Directive cannot be scoped out until the presence and distribution of these habitats in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood. However, given the known presence of blanket bog and wet modified bog habitats and the respective mosaics of these habitats across the Site from surveys undertaken to date (**Figures 6.2.1-6.2.6**), blanket bog and wet modified bog will be scoped in as IEFs.

Effects on semi-natural woodland (**Figures 6.2.1-6.2.6**) cannot be scoped out until the presence and distribution of these habitats in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood.

Effects on bats, fish populations (migratory salmonids and resident fish) and deer cannot be scoped out until the respective levels of activity in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood.

6.6.2 Potential Effects Scoped Out of the Assessment

In line with CIEEM guidance, detailed assessment is not required for features that are sufficiently widespread, unthreatened, and resilient to potential effects of the Proposed Development. Therefore, adverse effects on common and widely distributed habitats or species will be scoped out.

Based on the findings of the desk-based studies and fieldwork undertaken to date, the professional judgement of the EIA team, relevant project experience, and applicable policy or

guidance, generally common and widely distributed habitats or species which are not legally protected, will be scoped out of the assessment. Specifically, this includes habitats and species which do not fall within the categories subsequently listed, i.e., habitats not on Annex I to the Habitats Directive and species not on Annex II to the Habitats Directive and habitats or species not protected by other legislation (e.g., the Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 or the Protection of Badgers Act 1992).

Adverse effects on Airds Moss SAC can be scoped out of the assessment due to distance and the respective qualifying features (**Table 6.1**) and a lack of ecological connectivity and absence of hydrological connectivity with the Site.

Adverse effects on LNCS within 5 km of the Site (with the exception of those within the Site boundary): Guelt LNCS, Lugar Water: Holmhead to Braehead LNCS, Lugar Loch Wetlands LNCS, River Ayr: Mid Heilar to Chapelhouse LNCS, Crook Moss LNCS, River Ayr Floodplain LNCS, Marchhouse Hill LNCS, Ryderston Belt LNCS, Glaisnock Glen / Velvetere Wood LNCS, Darconner LNCS, Shaw Hill LNCS, Mansfield Burn LNCS, River Ayr: Damhead to Nether Heilar LNCS and New Cumnock Wetlands LNCS are scoped out of the assessment due to hydrological, topographical, and/or ecological separation, lack of connectivity, distance from the Site, and the interest features of the respective LNCS (as per **Table 6.2**).

Adverse effects on ancient woodland can be scoped out of the assessment, there being no impact or loss to areas of ancient woodland listed on the AWI within the Site (**Figure 6.1**).

Adverse effects on protected species targeted during baseline field surveys, including badger (*Meles meles*), otter, red squirrel, pine marten (*Martes martes*), water vole, reptiles and great crested newt (GCN) (*Triturus cristatus*) can be scoped out of the detailed assessment due the absence or lack of field survey signs, absence of relevant protected features for these species, low habitat suitability, and in cognisance of standard good practice and embedded mitigation (**Section 6.4.2**).

Adverse effects on beaver (*Castor fiber*) and wildcat (*Felis silvestris*) are scoped out of detailed assessment. Effects on these species are scoped out due to the absence of suitable habitat at the Site, the Site's geographical location being outwith the known range of the respective species and/or the lack of evidence of their presence locally from desk-based research and recent surveys at the Site.

6.7 Biodiversity Enhancement

The enhancement, restoration and creation of habitats of conservation value during the operational phase, through the delivery of a BEMP, would further reduce potential effects on habitats. The Proposed Development provides an opportunity to deliver biodiversity enhancement at the Site, in line with the objectives of NPF4 Policy 3, the Onshore Wind Policy Statement, and the Scottish Biodiversity Strategy to 2045. Accordingly, an outline BEMP, or similar, will be provided with the EIA Report.

Specific biodiversity enhancement proposals will be developed through discussions with the Applicant, landowners, and relevant technical specialists in order to enhance, create and connect habitats of biodiversity value. Based on the existing knowledge of the Site, biodiversity enhancement measures for the Proposed Development may include, but are not limited to, native broadleaf riparian planting and native broadleaf woodland expansion, hedgerow/native scrub creation and/or priority peatland restoration. The full suite of proposals will be presented within the outline BEMP in the EIA Report.

6.8 Scoping Questions to Consultees

Q6.1 Do consultees agree that the scope of IEFs to be included in the assessment is appropriate?

Q6.2 Do consultees agree that the methodology and scope of assessment is appropriate?

Q6.3 Do consultees agree with the potential effects to be scoped out of the assessment?

Q6.4 Are there any relevant consultees who should be consulted, or other sources of information that should be considered?

7.0 Ornithology

7.1 Introduction

This section describes the relevant legislation, policy and guidance, baseline conditions, proposed scope of assessment and methodology, proposed mitigation, and identifies potential impacts of the Proposed Development in relation to ornithological features.

This Chapter is supported by the following figures:

- **Figure 7.1a**: Vantage Point Survey Locations and Viewsheds: April 2023 to August 2024;
- **Figure 7.1b**: Vantage Point Survey Locations and Viewsheds: September 2024 to February 2025;
- **Figure 7.2**: Ornithological Survey Areas;
- **Figure 7.3**: Ornithological Designate Sites within 20 km; and
- **Confidential Figure 7.4**: Ornithological Design Constraints (this figure will only be provided to relevant consultees).

7.2 Consultation Undertaken to Date

The following statutory and non-statutory bodies have been consulted in relation to ornithology.

- RSPB Scotland: a data request was submitted to obtain existing ornithological records within the study area of the Site.
- SRSG: a data request was submitted to obtain existing ornithological records within the study area and the most recent available records from the Muirkirk and North Lowther Uplands SPA.

7.3 Surveys and Assessment Methodologies

7.3.1 Field Surveys

The following surveys have been completed between April 2023 and February 2025 to provide a two-year survey period. All surveys have been undertaken in line with the appropriate guidance (NS 2025a[44], Hardey et al. 2013[45], Gilbert et al. 1998[46]) and survey areas are detailed below. All survey areas were created using survey-specific buffers based on the Proposed Development provided at the time of survey commencement.

- Flight activity surveys: monthly from April 2023 to February 2025 allowing for coverage of the 2023 and 2024 breeding seasons and 2023/2024 and 2024/2025 non-breeding seasons; minimum of 36 hours per vantage point (VP) per season, as per NS 2025a[44] (**Figure 7.1a** and **Figure 7.1b**).

[44] NatureScot (2025a). Recommended bird survey methods to inform impact assessment of onshore wind farms. Available at: https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms [Accessed 10 November 2025]

[45] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013) Raptors: a field guide for surveys and monitoring (3rd edition). The Stationery Office, Edinburgh.

[46] Gilbert, G., Gibbons, D. W. and Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy.

- Scarce[47] breeding bird surveys: 2023 and 2024 breeding seasons, 2 km survey area (**Figure 7.2**).
- Black grouse lek surveys: 2023 and 2024 breeding seasons, 1.5 km survey area (**Figure 7.2**).
- Breeding wader surveys: 2023 and 2024 breeding seasons, 500 m survey area (**Figure 7.2**).
- Winter walkover surveys: 2023/2024 and 2024/2025 non-breeding season, 500 m survey area (**Figure 7.2**).

A target species list was defined from the following lists and refined on the basis of the species' perceived sensitivity to onshore wind farm developments (e.g., as set out in NS 2025a[44] and Annex 1 of NS 2025c[48]), knowledge of bird-habitat associations at the local/Scottish level and preliminary survey visits:

- Annex I of the EU Birds Directive[49];
- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) [50]; and
- Species (excluding passerines) included on the Birds of Conservation Concern (BoCC) Red List (Stanbury *et al.* 2021[51] and Stanbury *et al*. 2024[52]).

7.3.2 Study Area

The EIA Report will consider the following ornithological study areas (note that the buffers will be created from the finalised design):

- Designated sites: 20 km study area (based on NatureScot guidance, SNH 2016a[53]);
- Collision risk modelling: the results of the flight activity surveys will be used to inform collision risk modelling. A Collision Risk Analysis Area (CRAA) will be created by buffering proposed turbine locations by 500 m (as per NS 2024a[54]);

[47] Scarce breeding birds are those listed on Annex 1 of the EU Birds Directive and/or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and in the case of the Proposed Development consists of any raptor and owl species listed on either Annex 1 or Schedule 1.

[48] NatureScot (2025c). Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas. Available at: https://www.nature.scot/doc/guidance-note-assessing-significance-impacts-bird-populations-onshore-wind-farms-do-not-affect [Accessed 10 November 2025]

[49] Directive 2009/147/EC of the European Parliament and of the Council. Available at: https://www.legislation.gov.uk/eudr/2009/147/contents [Accessed 10 November 2025]

[50] Scottish Government (1981). Wildlife and Countryside Act 1981. Available at: https://www.legislation.gov.uk/ukpga/1981/69 [Accessed 10 November 2025]

[51] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds, 114, pp. 723-747.

[52] Stanbury, A. J., Burns, F., Aebischer, N. J., Baker, H., Balmer, D. E., Brown, A., Dunn, T., Lindley, P., Murphy, M., Noble, D. G., Owens, R., and Quinn, L. (2024) The status of the UK's breeding seabirds: an addendum to the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds, 117, pp. 471-487.

[53] Scottish Natural Heritage (2016a). Assessing connectivity with Special Protection Areas (SPAs). Available at: https://www.nature.scot/doc/assessing-connectivity-special-protection-areas [Accessed 10 November 2025]

[54] NatureScot (2024a). Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms. Available at: https://www.nature.scot/doc/guidance-using-updated-collision-risk-model-assess-bird-collision-risk-onshore-wind-farms [Accessed 10 November 2025]

- Scarce breeding birds[47]: 2 km study area from the proposed turbines (800 m buffer for the access track/other infrastructure where it extends beyond the turbine area), as per NatureScot guidance (NS 2025a[44]) and with reference to Goodship & Furness (2022[55]);
- Black grouse: 1.5 km study area from the proposed turbines (750 m for the access track/other infrastructure where it extends beyond the turbine area) as per NatureScot guidance (NS 2025a[44]) and with reference to Goodship & Furness (2022[55]);
- Breeding waders: 500 m study area from the proposed turbines/access track as per NatureScot guidance (NS 2025a[44]) and with reference to Goodship & Furness (2022[55]); and
- Cumulative assessment: as per NatureScot guidance (NS 2025b[56]), the Natural Heritage Zone (NHZ) level is considered practical and appropriate for most breeding species not connected to designated sites (for the Proposed Development, the NHZ will be NHZ 17, West Central Belt), unless a different geographical area is considered more relevant to a particular species.

7.3.3 Assessment

The assessment will consider the potential direct, indirect, and cumulative impacts that the construction and operation of the Proposed Development could have on Important Ornithological Features (IOFs, as per CIEM 2022[57]). The assessment will be supported by a technical appendix/confidential technical appendix for sensitive ornithological information that will include details of survey methodologies, all survey data and outputs from any collision risk modelling.

Impacts on IOFs will be assessed in relation to species' reference population, conservation status, range and distribution. The assessment of potential impacts will follow guidelines published by CIEMM (2022[57]) and NatureScot (NS 2025b[58], 2025c[48]) and involve the following process:

- Identifying potential impacts of the Proposed Development;
- Considering the likelihood of occurrence of potential impacts;
- Defining the nature conservation importance and conservation status of relevant populations for each IOF to determine the overall sensitivity;
- Establishing the magnitude of the likely impact (both spatial and temporal) on each IOF;
- Based on the above information, making a judgement as to whether or not the consequent effect is significant. This will be determined through a standard method of

[55] Goodship, N.M. and Furness, R.W. (MacArthur Green) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283. Available at: https://www.nature.scot/doc/naturescot-research-report-1283-disturbance-distances-review-updated-literature-review-disturbance [Accessed 10 November 2025]

[56] NatureScot (2025b). Assessing the cumulative impacts of onshore wind farms on birds. Available at: https://www.nature.scot/doc/guidance-assessing-cumulative-impacts-onshore-wind-farms-birds [Accessed 10 November 2025]

[57] CIEEM (2022) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Chartered Institute of Ecology and Environmental Management (CIEEM), Winchester.

[58] NatureScot (2025b). Assessing the cumulative impacts of onshore wind farms on birds. Available at: https://www.nature.scot/doc/guidance-assessing-cumulative-impacts-onshore-wind-farms-birds [Accessed 10 November 2025]

assessment based on professional judgement, considering both sensitivity and magnitude of impact with 'major' and 'moderate' effects considered to be significant;

- If a potential effect is determined to be significant, proposing measures to mitigate or compensate the effect where required;
- Considering opportunities for enhancement where appropriate; and
- Concluding residual effects after mitigation.

Where appropriate, the assessment will take into consideration specific measures of analysis, such as collision risk modelling using the NatureScot Band et al. (2007[59], 2024[60]) model.

7.3.4 Assessing Likely Significant Effects on a Special Protection Area (SPA)

The method for assessing the likely significant effects on a SPA is different from that employed for wider-countryside ornithological interests. The Habitats Directive is transposed into domestic legislation by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland). Regulation 48 includes a number of steps to be taken by the competent authority before granting consent (these are referred to here as an HRA). In order of application, the first four are:

- Step 1: consider whether the proposal is directly connected to or necessary for the management of the SPA (Regulation 48(1)(b)).
- if not, Step 2: consider whether the proposal (alone or in combination) is likely to have a significant effect on the SPA (Regulation 48(1)(a)).
- if so, Step 3: make an Appropriate Assessment of the implications for the SPA in view of that SPA's conservation objectives (Regulation 48(1)(a)).
- Step 4: consider whether it can be ascertained that the proposal will not adversely affect the integrity of the SPA ("Integrity Test") having regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given (Regulation 48(5) and 48(6)).

It has been established that there is potential for connectivity between the Proposed Development and the Muirkirk and North Lowther Uplands SPA. Information will be provided as part of the EIA submission to allow for an Appropriate Assessment to be carried out by the competent authority.

7.4 Existing Conditions

7.4.1 Designated Sites

In review of NatureScot's SiteLink website[61], the Site is located within 20 km of the following statutory designated sites with ornithological interests, as shown on **Figure 7.3**:

- Muirkirk and North Lowther Uplands SPA (underpinned by the Muirkirk Uplands Site of Special Scientific Interest (SSSI) and the North Lowther Uplands SSSI), adjacent to

[59] Band, W., Madders, M., and Whitfield, D.P (2007), Developing field and analytical methods to assess avian collision risk at wind farms. In: Janss, G., de Lucas, M. & Ferrer, M (eds) Birds and Wind Farms. (Madrid: Quercus).

[60] Band, W (2024), 'Using a collision risk model to assess bird collision risks for onshore wind farms. NatureScot Research Report 909'.

[61] https://sitelink.nature.scot/home [Accessed 10 November 2025]

the Site and designated for non-breeding hen harrier and breeding hen harrier, golden plover, merlin, peregrine falcon and short-eared owl.

Based on the guidance from NatureScot (SNH, 2016a[53]) regarding connectivity with SPAs and that the Site is adjacent to the SPA, there is potential for connectivity with the SPA, and a likely significant effect is concluded as part of the Habitats Regulations Appraisal process. Information to inform an Appropriate Assessment will be provided in the Ornithology Chapter.

7.4.2 Recorded Targeted Species

7.4.2.1 Black Grouse

Targeted black grouse surveys were undertaken in 2023 and 2024. No evidence of black grouse was recorded (lekking or otherwise). No evidence of black grouse has been recorded across any of the baseline surveys.

Data provided by the RSPB Data Unit indicated that black grouse have been recorded in the area between 2014 and 2023. Four of the 55 records provided by the RSPB Data Unit are located within the Site; three records from 2023 and one record from 2021. The records were all of individual males lekking, with the three records in 2023 all recorded on the same day. Surveys undertaken for the Proposed Development during April and May 2023 (or 2024) did not record any black grouse in the same area and the overall low records of black grouse on the Site (between the RSPB and baseline survey data) indicate that use of the Site is likely infrequent.

7.4.2.2 Raptors and Owls

Barn owl were identified to be breeding/roosting at two locations within the Site boundary during the 2023 breeding season and continued to occupy one of the locations in the 2024 breeding season (the other location was not checked in 2024 to avoid disturbance). Six additional potential breeding/roosting locations were identified within the 2 km survey area, mostly comprising working farm buildings outwith the Site boundary. One bird was recorded hunting close to the western boundary of the 2 km survey area.

Hen harrier were routinely recorded during baseline surveys with records almost entirely comprising of overwintering/non-breeding birds. Birds were most frequently recorded hunting within the Muirkirk and North Lowther Uplands SPA, with sightings occurring during late afternoon. A roost was identified within the SPA (outwith the Site boundary) with a single bird was observed going to roost.

Peregrine falcon were identified to be breeding at one location within the Site during the 2023 and 2024 breeding seasons. Activity across the baseline survey period was spread across the seasons and predominately associated with the known nesting site.

Red kite were identified to be breeding at one location within the Site during the 2024 breeding season. Activity across the baseline survey period was spread across the seasons.

Merlin (eight records – all during winter) and osprey (two records) were observed across the baseline survey period, but no evidence of breeding within the survey area was recorded.

Short-eared owl were infrequently recorded during baseline surveys, with all records within the Muirkirk and North Lowther Uplands SPA and between November 2023 and April 2024.

7.4.2.3 Waders

Curlew, golden plover, lapwing and ringed plover (target wader species) were all recorded during baseline surveys.

Curlew were identified to be breeding within the survey area with 4-6 territories identified during the 2023 breeding season and 2-3 territories identified during the 2024 breeding season.

Wintering golden plover were recorded and were identified to be regularly roosting at one location to the west of the Site during both the 2023/2024 and 2024/2025 non-breeding seasons with a minimum of 20 and a maximum of 220 birds present. No evidence of any golden plover breeding activity was recorded within the survey area.

Lapwing were identified to be breeding within the survey area with 1-2 territories identified during the 2023 breeding season and 1-4 territories identified during the 2024 breeding season.

Ringed plover were identified to be breeding within the survey area with 9-12 territories identified during the 2023 breeding season and 9-10 territories identified during the 2024 breeding season.

7.4.2.4 Gulls

Black-headed, common, great black-backed, herring and lesser black-backed gulls were all recorded during baseline surveys. Common gull were identified to be breeding in small numbers within the survey area. Herring gull were consistently recorded roosting on a lagoon/pool (a remnant from old opencast mine workings) to the west of the Site, with up to 400 birds recorded.

7.5 Design Considerations

Significant effects on ornithological features will be avoided or minimised where possible via the iterative design process (in line with the mitigation hierarchy) as further baseline information and environmental constraints data is gathered. Mitigation through iterative design will likely include:

- Barn owl: applying a 175 m disturbance buffer (Shawyer 2011[62]) around identified/suspected nest/roost sites (**Confidential Figure 7.4**). No turbines will be located within this buffer and infrastructure will be avoided/minimised.
- Black grouse: consideration of black grouse lek activity provided by the RSPB Scotland Data Unit with reference to the 500 m (operational disturbance) and 750 m (construction disturbance) buffers advocated by NatureScot.
- Hen harrier: with reference to Goodship & Furness[55]; applying a 500 m disturbance buffer (with no development within this buffer) and 750 m disturbance buffer (with development minimised within this buffer) around identified roost sites (**Confidential Figure 7.4**).
- Peregrine falcon: with reference to Goodship & Furness[55]; applying a 500 m disturbance buffer (with no development within this buffer) and 750 m disturbance buffer (with development minimised within this buffer) around the identified nest site (**Confidential Figure 7.4**).
- Red kite: with reference to Goodship & Furness[55]; applying a 300 m disturbance buffer (with no development within this buffer) and 500 m disturbance buffer (with development minimised within this buffer) around the identified nest site (**Confidential Figure 7.4**).

[62] Shawyer, C. R. 2011. Barn owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting. IEEM, Winchester.

7.6 Potential Significant Effects

The assessment will consider the potential for significant effects on IOFs, during the construction and operation of the Proposed Development. Where appropriate, impacts will also be considered in a cumulative assessment.

7.6.1 IOFs Scoped In

Whilst it is not possible to definitely scope out/in species from/to the assessment prior to undertaking collision modelling and a review of the ornithological baseline against the final design, considering the information available regarding the species assemblage and distribution at the Proposed Development and on the basis of professional experience, it is considered that black grouse, curlew, hen harrier, peregrine falcon, red kite and ringed plover are likely to be the species considered as IOFs and therefore scoped into the EIA assessment. Additionally, all qualifying features of the Muirkirk and North Lowther Uplands SPA will be considered within the context of the HRA, and information will be provided to inform an Appropriate Assessment to be carried out by the competent authority.

7.6.2 Ornithological Features Scoped Out

On the basis of baseline data, experience from other relevant projects and policy guidance or standards e.g., CIEMM 2022[57], NS 2025c[48], the following features will be 'scoped out' since significant effects are unlikely:

- Common and/or low conservation species not recognised in statute as requiring special conservation measures i.e., not listed as Annex 1/Schedule 1 species;
- Common and/or low conservation species not included in non-statutory lists i.e., not listed as Amber or Red-listed Birds of Conservation Concern species, showing birds whose populations are at some risk either generally or in parts of their range; and
- Passerine species, not generally considered to be at risk from wind farm developments (NS 2025a[44]), unless being particularly rare or vulnerable at a national level.

NatureScot have specific guidance relating to pink-footed goose which states "*In light of the robust population and its high avoidance rate of 99.8%, collision risk modelling for pink-footed geese is only required if a proposal has connectivity with a protected area where this species is a qualifying interest*.". Considering that pink-footed geese are not listed as a qualifying feature for any SPA within 20 km (maximum connectivity distance as per SNH 2016a[53]) of the Proposed Development, pink-footed goose is proposed to be scoped out of the assessment.

7.6.3 Approach to Mitigation

In addition to the design considerations detailed in **Section 7.5**, the following embedded mitigation will be considered to be in place prior to assessment.

- To ensure all reasonable precautions are taken to avoid disturbance to birds and comply with environmental legislation, prior to construction the Applicant will appoint a suitably qualified Ecological Clerk of Works (ECoW) who will advise the Applicant and the Contractor on all ornithological matters (with the assistance of a suitably qualified/licenced ornithologist if required). The ECoW will be required to be present on Site during the construction period and will carry out monitoring of works and briefings with regards to any ornithological sensitivities on the Site to the relevant staff within the Contractor and subcontractors.
- A Bird Disturbance Management Plan (BDMP) will be implemented during construction of the Proposed Development and will form part of the Construction Environmental Management Plan (CEMP). The BDMP will detail measures to ensure legal

compliance and safeguard breeding birds known to be in the area and will include species-specific guidance. The BDMP shall include pre-construction surveys and good practice measures during construction. Pre-construction surveys will be undertaken to check for any new breeding bird activity in the vicinity of the construction works. The ECoW will oversee the implementation of the above measures.

- An operational BDMP will also be implemented for species-specific mitigation measures for the scoped in IOFs identified to be present within the Site during the operational phase of the Proposed Development.

7.7 Questions for Consultees

Q7.1 Do consultees agree with the species proposed to be scoped out of the detailed assessment, and the resultant identified IOFs?

Q7.2 Do consultees believe that there are any further species, or any designated sites which need to be considered in the assessment?

Q7.3 Are there any other relevant sources of information that should be referenced with respect to the ornithology assessment?

Q7.4 Do consultees agree that the methodology and scope of the proposed ornithological impact assessment is appropriate?

Q7.5 Do consultees have any suggestions for habitat management measures?

8.0 Geology, Hydrogeology, Hydrology and Peat

8.1 Introduction

This section outlines the proposed scope of the EIA Report to assess the potential significant effects from the Proposed Development on geology (including soils), hydrology, hydrogeology and peat.

8.2 Environmental Baseline

8.2.1 Geology and Hydrogeology

The Site is shown by British Geological Survey (BGS)[63] to be underlain several sedimentary bedrock units comprising sandstones, limestones, coal measures and sedimentary rock cycles of Clackmannan Group. Lavas and intrusive igneous rocks are also noted across the Site. Several inferred faults are noted across the Site, generally with an east to west trend.

The bedrock is generally overlain by glacial till. Areas of peat are shown within the central, western and northern extents of the Site and alluvium and glaciofluvial deposits are noted along the southern and northwestern boundary of the Site associated with the Glenmuir Water, Gass Water and Bellow Water.

The glacial till and peat superficial deposits that underlie the Site are unlikely to contain significant amounts of groundwater due to low bulk permeability. Groundwater may be present within alluvium and glaciofluvial deposits however any groundwater within these deposits will be in hydraulic conductivity with the adjacent watercourses. The bedrock aquifer over the majority of the Site has been classified as a moderately productive aquifer described a multi-layered aquifer with low yields except where disturbed by mining or underlain by rocks of the Passage Group. Groundwater is considered to flow through fractures and other discontinuities.

All of Scotland's groundwater bodies have been designated as a Drinking Water Protected Area (DWPA). The Site is located within the Cumnock groundwater body (SEPA ID: 150646), which is currently (2023) classified as Poor overall status due to poor water quality.

8.2.2 Soils and Peat

National soil mapping for Scotland[64] indicates that the majority of the Site is underlain by noncalcerous gleys. The centre and north-western extent is shown to be underlain by dystrophic blanket peat and peaty gleys respectively.

Peatland classification mapping[65] indicates that the centre and northwestern extent of the Site is located within an area of Class 5 peatland (see **Figure 8.1**). There is a small extent of Class 1 priority peatland in the west of the Site, at Low Moss. Class 5 peatland areas are not considered to be a priority peatland habitat however soils may remain carbon rich with areas of deep peat. Class 1 peatland areas are considered nationally important priority peatland habitats with carbon rich soils and deep peat which are areas likely to be of high conservation value and restoration potential.

Phase 1 peat depth probing exercise has been completed by MacArthur Green (now SLR) in the northern extent of the Site, as shown in **Figures 8.2.1-8.2.3**. While peat is generally absent across the majority of the Site, areas of peat have been confirmed within the eastern extent, reaching depths of up to 3.1 m.

[63] GeoIndex (onshore) - British Geological Survey, Last accessed November 2025

[64] National soil map of Scotland | Scotland's soils, Last accessed November 2025

[65] Carbon and peatland 2016 map | Scotland's soils, Last accessed November 2025

The deepest areas of peat lie in the centre and west of the Site, up to 6.3 m and 5.6 m at Hillhead Moss and Low Moss respectively. Probing was not undertaken in the south of the Site due to an absence of desk-based information indicating potential peatland, however additional phase I probing will be completed in this area to verify.

8.2.3 Mining

The Mining Remediation Authority map[66] shows the Site is partially located within a high-risk area due to historic underground and opencast coal mining. These areas include sections of the former Duncanziemere, Dalfad and Gasswater collieries. Recent mining disturbance remains visible across parts of the Site, though much of the Site has been backfilled, there are areas requiring restoration.

JWHRoss prepared a Coal Mining Risk Assessment[67] at the Site in August 2023, the results of which have informed the Proposed Development layout.

8.2.4 Hydrology and Designated Sites

The northern extent of the Site is located within the Bellow Water / Gass Water surface water catchment whilst the southern extent of the Site is located within the Lugar / Glenmuir Water surface water catchment. Both catchments are part of the larger River Ayr catchment.

The local hydrology is shown on **Figures 8.3.1-8.3.3**. The Gass Water flows generally north and north-westward through the northern extent of the Site before discharging into the Bellow Water approximately 570 m northwest of the Site. The Bellow Water flows generally south-westward to the northwest of the Site before discharging into the Lugar Water approximately 2.2 km west of the Site. The Glenmuir Water flows generally north-westwards along the southern boundary of the Site before discharging into the Lugar Water approximately 2.2 km west of the Site.

None of the catchments which drain the Site have been designated as a DWPA. Both catchments have been classified by SEPA in 2023 with a Good to High overall status.

SEPA flood mapping[68] indicates that the Site is not at risk from coastal flooding. Fluvial flooding is shown along the banks of the Gass Water and Glenmuir Water. Areas of surface water flood risk are also shown across the Site however flood extents are generally confined to smaller watercourses within the Site or are shallow (<0.3m).

It is noted that local hydrology in the area will have been altered by historical mining.

Review of NatureScot's SiteLink[69] indicates that the following designated sites are noted within 500 m of the Site:

- Muirkirk Uplands Site of Special Scientific Interest (SSSI) which is located along the eastern boundary of the Site and 500 m north of the Site and has been designated for upland habitats including blanket bogs, palaeontology, and breeding and non breeding bird assemblage;
- Muirkirk and North Lowther Uplands Special Protection Area (SPA) which is located along the eastern boundary of the Site and 500 m north of the Site and has been designated for breeding bird assemblage; and

[66] Mining Remediation Authority Map Viewer, last accessed November 2025

[67] JWHRoss (August 2023), *Mining Stability Report Including Past Mining Risk Assessment. Proposed Windfarm Development, Glenmuir, East Ayrshire.*

[68] Flood Risk Management Maps, Last accessed November 2025

[69] SiteLink - Map Search, Last accessed November 2025

- Airds Moss Special Area of Conservation (SAC) which is located approximately 500 m north of the Site and has been designated for blanket bog habitats.

8.3 Potential Sources of Impact

Without mitigation or adherence to best practice, impacts on geology (including soils), hydrogeology, hydrology and peat could occur during the construction and operation phases of the Proposed Development. A summary of the potential effects on ground conditions and the water environment resulting from construction, and operation of a wind farm is provided below. These will be considered in the EIA Report.

8.3.1 Potential Impacts During Construction

The following potential impacts during the construction phase will be considered in the EIA Report.

- disturbance and loss of carbon rich soils and peat deposits;
- potential adverse impacts to designated blanket bog habitats (Muirkirk Uplands SSSI);
- ground instability (including peat slide if present);
- potential impacts on hydrological and hydrogeological receptors from disturbing contaminated land and historic mining areas;
- impacts on surface water and groundwater quality from pollution from fuel, oil, concrete or other hazardous substances;
- discharge of sediment laden runoff to drainage systems and watercourses;
- increased flood risk to areas downstream of the Site during construction through increased surface runoff;
- changes in groundwater levels, or saturation of peat deposits, from dewatering excavations;
- potential change of groundwater flow paths and contribution to areas of peat and GWDTEs;
- disturbance of watercourse bed and banks from the construction of culverts;
- potential adverse impacts to licenced and private water supplies, if present; and
- disturbance and/or pollution resulting from borrow pit formation use.

8.3.2 Potential Impacts During Operation

The following potential impacts during the operational phase will be considered in the EIA Report:

- increased runoff rates and flood risk, resulting from increases in areas of tracks and hard standing at turbines;
- changes in natural surface water drainage patterns (which may affect water contribution to areas of peat and GWDTE);
- changes to groundwater levels and groundwater movement;
- longer term impacts on abstractions for water supplies, particularly any supplies dependent on groundwater; and
- pollution impacts on surface water quality from maintenance work.

8.4 Method of Assessment and Reporting

The potential effect from the Proposed Development on geology (including soils), hydrogeology, hydrology and peat will be assessed by completing a desk study and field investigation followed by an impact assessment, the processes of which are detailed below.

8.4.1 Legislation, Policy and Guidance

The assessment will be undertaken in line with current legislation, planning policy and guidance, including but not limited to:

8.4.1.1 Legislation

Legislation relevant to this assessment includes:

- European Union (EU) Water Framework Directive (2000/60/EC);
- EU Drinking Water Directive (98/83/EC);
- The Environment Act 1995;
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations (2017);
- Environmental Protection Act 1990;
- The Flood Risk Management (Scotland) Act 2009;
- Water Environment and Water Services (Scotland) Act 2003;
- Environmental Authorisation (Scotland) Regulations 2018 (EASR);
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017;
- The Water Supply (Water Quality) (Scotland) Regulations, 2001; and
- Private Water Supplies (Scotland) Regulations 2006.

8.4.1.2 Planning Policy

- National Planning Policy Framework 4 (NPF4) adopted by Scottish Government on 13 February 2023. Specifically, Policy 2 (Climate Mitigation and Adaptation), Policy 5 (Soils), Policy 20 (Blue and Green Infrastructure), and Policy 22 (Flood Risk and Water Management); and
- The East Ayrshire Local Development Plan 2 (LDP2) adopted on 8 April 2024. Specifically Policy SS11 (Making space in settlements for green energy), Policy OS1 (Green and Blue Infrastructure), Policy NE2 (Development Impacts on Areas of Wild Land), Policy NE5 (Protection of Areas of Nature Conservation Interest), Policy NE7 (Geodiversity and Geological Interest), Policy NE11 (Soils), Policy NE12 (Water, Air, Light and Noise Pollution), Policy NE13 (Contaminated Land), Policy RE1 (Renewable Energy), Policy MIN7 (Borrow Pits), and Policy CR1 (Flood Risk Management).

8.4.1.3 Guidance

- Planning Advice Notes (PANs) published by the Scottish Government;
- SEPA and NetRegs Guidance for Pollution Prevention (GPP);
- Construction Industry Research and Industry Association (CIRIA) publications;
- SEPA Publications;

- Good Practice during Windfarm Construction document; and
- Scottish Government and NatureScot and other relevant guidance on peat, peat assessments and peat surveys.

8.4.2 Study Area

The geological, hydrological and hydrogeological (including private water supply (PWS) surveys) study area will extend to 500 m from the Site boundary. The study area for peat and soils will be within the Site boundary. The cumulative effects study area will extend to 5 km from the Site boundary.

8.4.3 Desk Study

An initial desk study will be undertaken to determine and confirm the baseline characteristics by reviewing available information relating to soils and peat, geology, hydrology, and hydrogeology such as groundwater resources, licensed and unlicensed groundwater and surface water abstractions, public and private water supplies, surface water flows, flooding, rainfall data, water quality and soil data. This will include review of published geological maps, Ordnance Survey maps, aerial photographs, and site-specific data such as digital terrain models (slope plans) and geological literature.

The desk study will identify sensitive features which may potentially be affected by the Proposed Development and will confirm the geological, hydrogeological, and hydrological environment.

8.4.4 Field Surveys

The hydrological assessment specialists will liaise closely with the project ecology and geology/ geotechnical specialists to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed.

A detailed site visit and walkover survey will be undertaken, to:

- verify information collected during the desk and baseline study;
- identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;
- visit any GWDTE (in consultation with the project ecologists);
- verify flow paths and any areas of flooding identified by SEPA;
- obtain private water supply information from East Ayrshire Council and visit any public and private water supplies within the study area that might be affected by the Proposed Development to confirm details of the location of the abstraction, its type and use, as required;
- prepared a schedule of potential watercourse crossings (where required);
- undertake an initial suite of water quality sampling of the predominant watercourses which drain the Site;
- assess the Site geomorphology and conduct additional Phase I and Phase II peat depth; and
- inspect rock exposures, established by probing an estimate burden thickness (a probe is pushed vertically into the ground to refusal and the depth is recorded).

The desk study and field surveys will be used to identify potential development constraints and be used as part of the design of the Proposed Development.

Once the desk study is completed and sensitive soil and peat, geological and water features are confirmed an EIA Report will be prepared to assess the potential effects on soils and peat, geology, hydrology and hydrogeology because of the construction and operation of the Proposed Development.

8.4.5 Assessment of Effects

The purpose of this assessment will be to:

- assist in the micrositing of turbines, tracks and associated infrastructure in areas of no peat or shallow peat and in the least hydrogeologically and hydrologically sensitive areas by applying buffer zones around watercourses, GWDTE and PWS, and other hydrological features;
- determine what the likely effects of the Proposed Development are on the hydrological regime, including water quality, flow and drainage;
- assess potential effects on water (including groundwater) dependent habitats;
- determine suitable mitigation measures to prevent significant hydrological and hydrogeological effects; and
- develop an acceptable code for working on the Site that will adopt best practice procedures, effective management and control of on-site activities to reduce or offset any detrimental effects on the geological, hydrogeological, soils, and hydrological environment.

It is anticipated the EIA Report would include the following technical appendices and assessments:

- peat landslide hazard and risk assessment (PLHRA);
- outline peat management plan (PMP);
- carbon calculator;
- outline borrow pit appraisal;
- coal mining risk assessment (CMRA);
- schedule of watercourse crossings (which will comprise of photographs and dimensions);
- private water supply risk assessment in accordance with SEPA's guidance[70], as required;
- GWDTE risk assessment in accordance with SEPA's guidance[70], as required.

A qualitative risk assessment methodology will be used to assess the significance of the potential effects. Two factors will be considered: the sensitivity of the receiving environment and the potential magnitude should that potential impact occur.

This approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the risk presented by the Proposed Development. This approach also allows effort to be focused on reducing risk where the greatest benefit may result.

[70] guidance-on-assessing-the-impacts-of-developments-on-groundwater-abstractions.docx, last accessed November 2025

The sensitivity of the receiving environment (i.e. the baseline quality of the receiving environment as well as its ability to absorb the effect without perceptible change) and the magnitude of change will each be considered through a set of pre-defined criteria.

The sensitivity of the receiving environment together with the magnitude of change defines the significance of the effect, which will be categorised into level of significance.

8.4.5.1 PLHRA and Outline PMP

A Stage 1 PMP will be prepared as a supporting technical appendix in line with NPF4 and SEPA Regulatory Position Statement: Developments on Peat (2012). The Waste Framework Directive (WFD) 2008/98/EC, transposed into National Law under The Waste Management Licensing (Scotland) Regulations 2011, sets out a requirement to apply a waste hierarchy. In terms of this project, this hierarchy should be considered as follows:

- prevent excavation;
- reduce volumes of peat excavated; and
- reuse excavated peat in a manner to which it is suited.

The objective of the PMP is to demonstrate to SEPA and other relevant parties that: the extent and characteristics of peat at the Site have been investigated; excavations in peat have been minimised wherever possible through design iterations and adoption of appropriate design and mitigation hierarchy; and that excavation and subsequent management of peat, including an estimation of quantities, has been considered as part of the EIA.

The following works will be completed:

- additional phase 1 peat depth survey at 100 m grid for areas of the Site that have not been previously surveyed;
- additional peat depth survey at 10 m grid at proposed infrastructure locations will be completed (the probing will also provide information of the substrate below the peat), and 50 m centres with 10 m offsets along linear infrastructure;
- a limited (in terms of aerial extent) geomorphological mapping exercise will be undertaken to link the topographic features with the underlying geology and to visit those areas of the Site that may be identified as potentially ‘at risk from peat slide’;
- the thickness of the peat will be established by probing and the underlying sub-strata confirmed by inspection of watercourses;
- the investigation will consider turbine locations, access routes, compounds and borrow pits for signs of existing or potential peat instability;
- augering of a representative selection of peat probe locations will be undertaken and the proportion of acrotelmic and catotelmic peat recorded; and
- output from the field survey will comprise a record of investigation locations and summary of peat depths and augering results.

A PLHRA will be completed using the Site survey data and slope analysis (using DTM data), if required by best practice guidance, highlighting areas that may be impacted by a peat slide so that appropriate mitigation measures and can be identified.

8.4.6 Cumulative Impacts

A review of other existing and proposed developments near the Proposed Development will be undertaken and potential impacts on geology (including soils), hydrogeology, and hydrology and peat will be assessed to identify cumulative impacts. With regard to the Proposed Development, it is considered that mitigation measures will be proposed that will

have a neutral effect or provide betterment compared to baseline conditions. It is not considered that there will be any significant residual impact to report.

The cumulative effects on geological, hydrological and hydrogeological receptors will be assessed using the surface water catchments within the study area, with a maximum downstream distance of 5 km from the Site boundary.

8.4.7 Approach to Mitigation

The Proposed Development will be refined through iterative design processes, evolving in response to constraints identified during baseline and field studies, with the aim of avoiding or minimising potential impacts on receptors wherever possible.

For example, it is expected that the following potential mitigation measures will be included in the design of the Proposed Development:

- existing access tracks and watercourse crossings will be utilised as part of the Proposed Development where technically possible;
- a buffer of 50 m will be applied to watercourses shown on 1:10,000 scale mapping. Where this is not maintained additional survey work will be completed;
- site-specific peat probing will be undertaken in accordance with current best practice guidance to allow a PLHRA and outline PMP to be prepared;
- a site-specific PLHRA will be prepared, and areas of potential increased peat slide risk will be avoided or mitigation measures to manage these risks;
- a PMP will be prepared to show how the integrity of soil and peat will be safeguarded; and
- impacts on private water supply sources and areas of GWDTE will be avoided.

There is much best practice guidance which has been developed to assist developers minimise the risks associated with wind farm construction and operation; this will be used to develop site-specific mitigation measures. Measures will be proposed to control and mitigate, for example, pollution risk (from anthropogenic and geogenic sources), flood risk, watercourse crossings, impacts on surface and groundwater flow paths, and management of peat and carbon rich soils.

Good practice measures will be applied in relation to pollution risk, and management of surface run-off rates and volumes. This will form part of the final CEMP to be implemented for the Proposed Development.

8.5 Consultation

As part of the consultation phase of the project, environmental data and views of the Proposed Development will be sought from:

- East Ayrshire Council;
- SEPA;
- NatureScot;
- Scottish Water; and
- Ayrshire Rivers Trust.

8.6 Matters Scoped Out

It is proposed that the potential impacts outlined above will be assessed as part of the EIA Report.

At this stage, it is proposed that the following can be scoped out of detailed assessment:

- It is proposed to scope out effects on geology. While there will be effects arising from rock extraction for borrow pits, track construction and for turbine and crane pad areas, these are limited in area and do not extend beyond the immediate development footprint. No particularly sensitive geological features have been identified within the Site. Potential effects on carbon rich soils and peat will be assessed in full.
- A standalone detailed Flood Risk Assessment. Published mapping confirms that flooding at the Site is limited to fluvial and surface water flooding which is largely confined to the immediate watercourse corridors. No development is proposed within mapped floodplain of the Glenmuir Water, and the Proposed Development will utilise an existing crossing of the Gass Water and therefore no development is proposed within either mapped floodplain. It is proposed, therefore, that a simple screening of the potential sources of flooding (fluvial, coastal, groundwater, pluvial, infrastructure etc.) is presented in the EIA Report and measure that would be used to control the rate and quality of runoff will be specified in the EIA Report.
- A Drainage Impact Assessment. Design standards and measures which would be used to control and manage incident rainfall would be specified in the EIA Report. A site drainage design plan would be prepared as part of the detailed site design (post planning) and form part of the final Construction and Environmental Management Plan. This would be submitted to SEPA for approval at that stage.
- Potential impacts on the designated sites as part of the geology, hydrogeology, hydrology and peat chapter, except for the blanket bog features of the Muirkirk Uplands SSSI. The other designated features of the Muirkirk Upland SSSI and SPA will be assessed in full as part of the ornithology chapter (see **Chapter 7**). The Airds Moss SAC is located within a different hydrological catchment to the Proposed Development and therefore will not be at risk from the Proposed Development.

8.7 Questions to Consultees

Q8.1 It is proposed, therefore, that a simple screening of potential flooding sources (fluvial, coastal, pluvial, groundwater etc.) is presented in the EIA Report. Is this approach acceptable?

Q8.2 It is not proposed to prepare a detailed drainage design. Rather measures that would be used to control the rate and quality of runoff will be specified in the EIA Report. Is this approach acceptable?

Q8.3 Site investigations, including detailed peat probing, augering and condition assessment, private water survey, and GWDTE assessment will be undertaken as part of the proposed assessment. Should any additional investigation or data sources be considered when assessing baseline conditions?

Q8.4 Given the historic mining which has been undertaken at the Site it is proposed to undertake an initial suite of water quality sampling as part of the field work to establish the current baseline setting. Is this acceptable?

Q8.5 It is not proposed to establish groundwater monitoring points, surface water monitoring points or undertake leachability trials of any rock as there is published data that can be used to characterise baseline conditions and complete the impact assessment. Is this acceptable?

Q8.5 Please advise if there is any specific information or methodology that should be used / followed as part of the private water supply risk assessment?

Q8.6 Do you agree that the scope of the proposed assessment is appropriate?

9.0 Noise and Vibration

9.1 Introduction

9.1.1 Overview

Noise will be generated by the Proposed Development during the construction and operational phases. The effects of these factors are assessed at residential receptor locations in the vicinity of the Proposed Development by comparing likely noise levels arising with the relevant noise limits.

9.2 Methodology

9.2.1 Study Area

9.2.1.1 General Principles

Noise sensitive receptors for the purposes of the noise impact assessment are defined as residential receptor locations in the vicinity of the Proposed Development. Noise limits for construction and operational noise apply at residential receptor locations. No non-residential noise-sensitive receptors have been identified in the vicinity of the Proposed Development.

Receptors have been identified based on publicly available mapping data, aerial photography, and street-level photography, where applicable. Receptors will be finalised for the EIA based on these same sources, including AddressBase data.

One property, High Glenmuir (262395, 620756) is anticipated to be taken out of residential use by the Proposed Development and, if confirmed, will therefore not be assessed.

Two further properties, Duncanziemere (261346, 621754) and Dalfad (262115, 622213), are identified as non-habitable properties (ruins) and will not be assessed.

If noise impacts are considered acceptable at the nearest noise sensitive receptors, it can be inferred that they will be acceptable at receptors at greater distances from noise sources (in the same general direction).

9.2.1.2 Construction Noise

The study area for construction noise is set at 300 m from works areas, including access tracks, turbine hardstanding, construction compounds, and locations of ancillary infrastructure. The nearest identified noise-sensitive receptors to construction works areas based on the scoping layout are set out in **Table 9.1**, alongside the closest distance to potential works areas. Receptors falling outside of the study area for the finalised design layout will not be assessed.

Table 9.1: Construction Noise Receptors

Receptor	Co-ordinates (Easting, Northing)	Approx. Distance to Works Area
CR1 - Boghead	263554, 624717	470 m
CR2 - Stonebiggs	262423, 623927	550 m
CR3 - Laigh Glenmuir	261709, 620412	360 m
CR4 - Glenview Cottage	262364, 620072	130 m
CR5 - Whiteholm	262481, 619944	250 m
CR6 - Dornal	263343, 619522	490 m

9.2.1.3 Operational Noise

The study area for operational wind turbine noise is defined by the predicted operational noise levels relative to the relevant noise limits. The lowest noise limit potentially applicable to noise from all wind farm developments is 35 dB L_{A90}. Therefore, if predicted cumulative operational noise levels are below 35 dB L_{A90} then the noise sensitive receptors will fall outside of the study area.

In addition to this, the study area is also set by the predicted operational noise levels from the Proposed Development acting alone. It is considered that noise sensitive receptors can be scoped out where predicted operational noise levels from the Proposed Development acting alone are below 25 dB L_{A90}, which would result in negligible contributions to any potential exceedance of the noise limit even on a cumulative basis.

The operational noise study area for sources other than wind turbines (i.e. ancillary infrastructure including substations, transformers, and any energy storage) will comprise all noise-sensitive receptors within 500 m of relevant sound sources. Such sources are not included in the scoping layout, but will be kept under review.

The closest noise-sensitive receptors identified at this stage are set out in **Table 9.2**.

Table 9.2: Operational Noise Receptors

Receptor	Co-ordinates (Easting, Northing)	Approx. Distance to Nearest Turbine
R1 - Boghead	263554, 624717	950 m
R2 - Stonebiggs	262423, 623927	800 m
R3 - Carbello	261166, 622875	1150 m
R4 - Sharif House	261014, 622559	1300 m
R5 - Sunnyside	261023, 621973	1400 m
R6 - Darmalloch	260998, 620282	1650 m
R7 - Laigh Glenmuir	261709, 620412	950 m
R8 - Glenview Cottage	262364, 620072	550 m
R9 - Whiteholm	262481, 619944	550 m
R10 - Low Garleffan	262461, 619497	800 m
R11 - Dornal	263343, 619522	600 m
R12 - Nether Guelt	263611, 619278	950 m
R13 - Springhill Farm	264178, 619985	1150 m

9.2.2 Construction Noise

9.2.2.1 Construction of Wind Turbines and Access Tracks

The assessment of construction noise will be undertaken in accordance with BS 5228 1:2009+A1:2014[71] 'ABC method' (as detailed in BS 5228-1 Annex E).

The lowest (worst-case) background noise category (Category A) will be assumed, setting noise thresholds of 45, 55 and 65 dB L_{Aeq}, for night-time (23:00-07:00), evening and weekends

[71] British Standards Institute, BS 5228-1:2014+A1:2019 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (London: BSI, 2019)

(19:00-23:00 weekdays, 13:00-23:00 Saturdays and 07:00-23:00 Sundays), and daytime (07:00-19:00 weekdays and Saturdays 07:00-13:00) periods respectively.

Construction noise effects lasting for one month or more will be deemed significant where noise levels exceed the applicable thresholds.

Predicted construction noise levels will be calculated using spreadsheet-based calculation methods incorporating typical representative source noise data obtained from manufacturer data or BS 5228-1 Annex C or Annex D, as well as ground conditions and meteorological factors.

Screening distances will be established beyond which construction noise levels are predicted to fall below significance thresholds, with more detailed assessment undertaken to quantify and report the level of noise at receptors within these distances, if required.

9.2.2.2 Construction Traffic

HGV movements associated with delivery of construction materials will be assessed along identified access routes and at sensitive receptors near site access points.

Construction traffic noise will be assessed in accordance with the guidance provided in the Design Manual for Roads and Bridges (DMRB) LA 111[72]. The assessment will consider the number of construction vehicle movements during peak construction periods. The basic noise level (BNL) will be calculated for road links affected by construction traffic, using the calculation methods set out in Calculation of Road Traffic Noise[73] (CRTN), and considering baseline traffic scenarios and 'with construction traffic' scenarios.

In accordance with DMRB guidance, a short-term increase of 1 dB $L_{A10,18h}$ or greater will be considered potentially adverse effect, with a short-term increase of 3 dB $L_{A10,18h}$ required for a significant noise impact.

9.2.3 Operation Noise – Wind Turbines

Operational turbine noise assessment will be conducted in accordance with the methodology set out in ETSU-R-97[74], the Institute of Acoustics (IOA) Good Practice Guide[75] (GPG).

Where suitable baseline noise data does not already exist, baseline noise surveys will be undertaken at representative noise-sensitive receptors to establish the relationship between background noise levels ($L_{A90,10min}$) and wind speed at 10 m height standardised wind speeds, derived with respect to the proposed turbine hub height. Survey durations will typically extend over a continuous period of at least 3 weeks to capture a sufficient range of wind speeds and directions in accordance with IOA GPG recommendations.

Derived noise limits will be established following ETSU-R-97 criteria. For daytime periods (07:00 to 23:00), the noise limit is 35-40 dB L_{A90} or 5 dB above the 'quiet day-time hours' prevailing background noise, whichever is the greater. The actual value within the 35-40 dB(A) lower limiting value range depends on the number of dwellings in the vicinity; the impact of the limit on the power able to be generated by the Proposed Development; and the duration and level of exposure. With reference to the night-time period, ETSU-R-97 sets out a noise limit of 43 dB L_{A90} or 5 dB above night-time background noise levels, whichever is greater.

[72] Highways England, Design Manual for Roads and Bridges LA 111 Noise and vibration, Revision 2 (London: Highways England, 2020).

[73] Department of Transport and Welsh Office, Calculation of Road Traffic Noise (CRTN), (London: HMSO, 1988).

[74] ETSU-R-97: The Assessment and Rating of Noise from Wind Farms (London: ETSU for the DTI, 1996)

[75] Institute of Acoustics, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (St Albans: IOA, 2013)

An exception to these criteria is made where a resident is considered to be financially involved with the Proposed Development, whereby higher noise limits are permitted to be adopted for those properties, typically adopting 45 dB(A) as the lower limiting value during both daytime and night-time periods.

Noise predictions will assume downwind noise propagation in all directions, with assessments undertaken across the operational wind speed range.

Where noise from the Proposed Development is 10 dB or more below the adopted noise limits, the contribution to cumulative noise from the Proposed Development will be considered to be negligible.

The assessment methodology will be updated to reflect any updates to ETSU-R-97 or the IOA GPG adopted by the Scottish Government prior to the submission of the Environmental Impact Assessment Report (EIAR).

9.2.4 Operational Noise – Other Sources

Noise from ancillary infrastructure, including substations, transformers, and any energy storage or other collocated sound sources will be assessed against appropriate criteria using BS 4142:2014+A1:2019[76].

If required, background sound levels ($L_{A90,T}$) will be established through baseline surveys conducted during representative time periods. The specific sound level ($L_{Aeq,T}$) from operational infrastructure will be predicted based on manufacturer sound power data, topography, ground conditions and meteorological conditions.

Typically, a difference of around +10 dB or more between rating level and background level is likely to indicate significant adverse impacts, while a difference of around +5 dB is likely to indicate adverse impacts. Where the rating level does not exceed the background sound level, this is an indication of low impact. However, the assessment will consider the context in which the sound occurs to determine significance.

9.2.5 Cumulative Noise – Wind Turbines

Cumulative assessment will consider the combined operational noise from the Proposed Development and other existing, consented, or in-planning wind energy developments affecting the study area in accordance with relevant guidance.

The assessment will identify all relevant wind energy developments that are predicted to contribute 25 dB L_{A90} or greater at any receptor within the study area.

The assessment will compare cumulative noise levels against the derived noise limits.

Currently, no live developments are identified within 5 km of the Site. However, it is noted that The Drum Wind Farm application was refused in September 2025 and could be subject to an appeal, while Glenwater Wind Farm is identified as being at Scoping stage and may become a live application prior to submission of the Proposed Development EIAR.

9.2.6 Cumulative Noise – Other Sources

The cumulative effect of operational noise from other non-turbine sources, including substations and ancillary infrastructure from adjacent developments, will be considered where relevant.

[76] British Standards Institution, BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (London: BSI, 2019).

Where infrastructure from multiple developments is within 500 m of the same receptors such that cumulative effects could be significant, a cumulative assessment of combined sound levels will be undertaken, with the assessment following the BS 4142:2014 methodology to determine the cumulative rating level and assess the likelihood of adverse impacts.

9.2.7 Topics Scoped Out

The following topics are proposed to be scoped out of the detailed assessment:

- Construction vibration: Vibration impacts arising from construction activities are typically localised and limited in spatial extent. Any vibration arising from blasting operations can be appropriately controlled through standard management measures secured within the Construction Environmental Management Plan (CEMP).
- Operational vibration: At the anticipated separation distances between wind turbines and residential receptors, vibration levels from turbine or other collocated technology operation are expected to be imperceptible to human receptors.
- Acoustic features (tonality and amplitude modulation): These characteristics are appropriately addressed through post-construction compliance monitoring and planning conditions, consistent with standard Scottish planning practice.
- Low-frequency noise: Available evidence demonstrates that control of noise through A-weighted assessment methodologies provides suitable protection against low-frequency noise effects.
- Infrasound: Infrasound levels generated by wind turbines and associated infrastructure are imperceptible at residential receptor locations and do not require detailed assessment.
- Operational maintenance activities: Noise effects from maintenance activities and associated traffic movements during the operational phase are expected to be negligible given the limited frequency and nature of such activities.

9.3 Baseline Conditions

A baseline noise survey has not yet been undertaken at the time of preparing this Scoping Report. However, a baseline noise monitoring campaign will be conducted at representative noise-sensitive receptor locations in accordance with ETSU-R-97, the IOA GPG, and supplementary Scottish Government guidance prior to submission of the EIAR.

Survey locations will be selected to represent the range of receptors and sound environments that are present in the vicinity of the Proposed Development, and will be agreed with EAC.

Data from this survey will be supplemented by 2022 baseline noise data from The Drum EIAR[77] at relevant locations.

Some receptors will be assigned representative baseline noise data from suitably similar alternative locations for which baseline noise data is available.

The proposed wind farm site is located in a rural area characterised by agricultural land uses, with scattered residential properties and small settlements in the surrounding landscape. Based on the rural character of the area, the baseline noise environment is anticipated to be dominated by natural sound sources including wind-induced vegetation noise, rainfall, and flowing water from burns and streams. Biological sources such as birdsong, livestock, and

[77] Greencat Renewables, The Drum Wind Farm Environmental Impact Assessment Report: Chapter 8 Noise, Report Reference C3881-891, Version 1.0 (prepared for Wind Estate (UK) Ltd, 9 November 2022).

other wildlife are also expected to contribute to the ambient soundscape, particularly during daytime periods.

9.4 Impact Assessment

This section presents a qualitative and bounding assessment of likely noise effects to inform the proposed scope of the Environmental Impact Assessment. The purpose of this assessment is not to present final predictions, but to identify whether there is a credible pathway to significant effects, and whether detailed quantitative assessment is required at the EIAR stage.

9.4.1 Construction Noise

9.4.1.1 Turbine Erection and Construction of Access Tracks

Construction noise effects would arise from typical wind farm activities including earthworks, track construction, turbine foundation works, and turbine erection. These activities are temporary, intermittent, and spatially mobile, with the noisiest activities limited in duration at any individual location.

The nearest noise-sensitive receptors are located at distances where construction noise effects can be effectively managed through standard best-practice controls in accordance with BS 5228-1:2009+A1:2014. Construction works would be undertaken during normal daytime working hours, with no routine evening or night-time works proposed.

Given the temporary nature of construction activities, the separation distances to receptors, and the ability to control noise through a Construction Environmental Management Plan (CEMP), significant construction noise effects are not anticipated. On this basis, it is proposed that construction noise be controlled through a CEMP rather than detailed quantitative prediction at the EIAR stage.

9.4.1.2 Construction Traffic Noise

Construction traffic would result in a temporary increase in HGV movements along local access routes during peak construction periods. Some of these routes are characterised by low baseline flows typical of rural areas.

On low-flow roads, changes in calculated road traffic noise are not a reliable indicator of perceptibility, and noise effects are more appropriately considered in terms of absolute noise levels, duration, and the temporary nature of the activity. This is recognised within DMRB, which identifies limitations in the application of standard traffic noise metrics at low flows.

Given the temporary duration of construction traffic, the limited number of daily movements, and the absence of sensitive receptors in close proximity to site access points, significant construction traffic noise effects are not anticipated. It is therefore proposed that construction traffic noise be addressed qualitatively at EIAR stage, supported by a Construction Traffic Management Plan (CTMP).

9.4.1.3 Operational Noise

Operational noise effects would arise from turbine operation and would be assessed in accordance with ETSU-R-97 and the IOA Good Practice Guide. Noise-sensitive receptors have been identified at distances typical of onshore wine developments in Scotland.

Review of existing baseline noise data in the surrounding area, together with preliminary layout and turbine scale information, indicates that compliance with ETSU-R-97 noise limits is achievable through standard design measures, including turbine selection, layout optimisation and, where required, operational noise management.

While detailed quantitative assessment will be undertaken at EIAR stage following completion of a site-specific baseline noise survey, there is no credible pathway to significant operational noise effects that cannot be appropriately mitigated through established industry practices.

Operational wind turbine noise therefore remains scoped into the EIAR; however, no significant residual effects are anticipated.

9.4.2 Operational Noise – Ancillary Infrastructure

Operational noise form ancillary infrastructure such as substations, transformers or energy storage facilities would be continuous in nature but controllable through equipment specification and acoustic design.

Where such infrastructure is located sufficiently distant from noise-sensitive receptors, operational noise effects would be negligible. Where infrastructure is located closer to receptors, assessment would be undertaken in accordance with BS 4142, with mitigation incorporated as necessary to achieve low impact.

Subject to final infrastructure locations, significant operational noise effects from non-turbine sources are not anticipated. It is proposed that this topic be scoped out where no such infrastructure is located within 500 m of any noise-sensitive receptor.

9.4.3 Cumulative Noise

Cumulative operational noise effects would only arise where other wind energy developments contribute materially to noise levels at the same receptors.

At scoping stage, no other operational or consented wind farms have been identified that would give rise to cumulative noise effects. Should additional developments become operational or materially progressed prior to EIAR submission, a cumulative operational noise assessment will be undertaken where their contribution at any receptor is predicted to be greater than 25 dB L_{A90}.

Where cumulative operational noise levels are predicted to remain below ETSU-R-97 noise limits, significant cumulative effects are not anticipated.

9.4.4 Impact Assessment Summary

On the basis of the qualitative and bounding assessment presented above, there is no credible pathway to significant noise effects during construction or operation of the Proposed Development that cannot be effectively managed through standard design and mitigation measures. The proposed scope of the EIAR therefore focuses on operational wind turbine noise, with other noise and vibration topics either scoped out or addressed through management plans.

9.5 Mitigation

9.5.1 Embedded Mitigation

A range of embedded mitigation measures will be incorporated into the design and operational management of the Proposed Development to minimise noise impacts at sensitive receptors.

A Construction Environmental Management Plan (CEMP) will be prepared and implemented throughout the construction phase to control noise emissions from construction activities. The CEMP will include specific measures such as:

- restrictions on working hours (typically 07:00-19:00 Monday to Friday, 07:00-13:00 Saturday, with no working on Sundays or public holidays except in emergency situations);

- use of modern, well-maintained plant and equipment fitted with appropriate silencers and acoustic enclosures;
- implementation of “quiet” working methods where practicable;
- establishment of site speed limits to reduce vehicle noise;
- positioning of static plant (generators, compressors) as far as practicable from sensitive receptors;
- use of low-noise reversing alarms (broadband or ambient-sensitive types); and

A Construction Traffic Management Plan (CTMP) will be prepared in consultation with the relevant roads authority to manage construction traffic movements and minimise associated noise impacts, where practicable. The CTMP will include:

- scheduling of deliveries to avoid sensitive times where practicable;
- use of designated haul routes that avoid, where possible, the most sensitive receptors and residential areas;
- speed restrictions on access tracks and approach roads;
- maintenance of road surfaces and access tracks in good condition;
- sheeting of loaded vehicles carrying aggregates or spoil;
- advance communication with local communities regarding abnormal load deliveries and peak construction traffic periods; and
- procedures for monitoring and managing construction traffic movement throughout the construction programme.

Turbine selection will consider acoustic performance as a design criterion, with preference given to turbine models with reduced sound power levels, such as those fitted with serrated trailing-edge (STE) blades, or enhanced noise reduction modes where these are available and compatible with the energy yield requirements of the project.

The layout design will consider separation distances to noise-sensitive receptors as part of the iterative design process, seeking to minimise noise effects at residential properties while balancing other environmental and technical constraints.

Operational infrastructure (substations, transformers, etc.) will be specified to meet appropriate noise emission standards, with equipment selection prioritising lower-noise models and incorporating acoustic enclosures, attenuators, or silencers as standard where necessary to meet predicted noise levels comfortably below BS 4142 criteria.

9.5.2 Further Mitigation

Where further noise mitigation control measures are required, provision of acoustic screening or barriers will be implemented, where necessary, for particularly noisy construction activities in proximity to receptors.

Turbine curtailment strategies can be implemented to reduce noise emissions during specific operational conditions, which may include certain wind speeds or directions or time periods.

These potential mitigation measures provide flexibility to ensure that the Proposed Development can operate in full compliance with the relevant noise criteria. Any required mitigation will be secured through appropriately worded planning conditions.

9.6 Residual Effects

9.6.1 Description of Potential Residual Effects

Following implementation of embedded mitigation measures, residual construction noise effects are anticipated to be not significant. Construction noise will be temporary, limited to normal working hours, and controlled through the CEMP to ensure compliance with BS 5228 1 criteria. Minor adverse effects of short duration may occur at receptors in close proximity to construction activities during peak periods. Construction traffic noise effects are similarly anticipated to be not significant given the temporary nature of impacts and implementation of the CTMP, although minor short-term effects may occur at receptors immediately adjacent to access routes.

Operational turbine noise will be assessed against ETSU-R-97 derived noise limits. The Proposed Development is anticipated to comply with applicable noise limits at all receptors. However, turbine noise may still be audible at some locations some of the time.

Operational noise from ancillary infrastructure, if applicable, will be designed to achieve low impact under BS 4142 methodology through appropriate equipment specification and acoustic mitigation. However, noise from such sources may still be audible at some locations some of the time.

Cumulative operational noise effects will be assessed where the Proposed Development operates in combination with other wind energy developments. Where cumulative noise limits are met, residual cumulative effects are anticipated to be not significant. Additional mitigation using noise-optimised operational modes will be adopted, if required.

9.6.2 Statement of Significance

The Proposed Development is anticipated to comply with relevant noise criteria for all development phases, ensuring appropriate protection of residential amenity at all identified noise-sensitive receptors. It is not anticipated that significant residual noise effects would occur from the Proposed Development.

9.7 Questions to Consultees

Q9.1 Is it agreed that construction noise effects can be appropriately addressed through standard best-practice controls secured within a CEMP, without the need for detailed quantitative construction noise predictions at EIAR stage, given the temporary nature of works, typical separation distances to receptors, and proposed working hours?

Q9.2 Is it agreed that, on low-flow rural roads, construction traffic noise effects are more appropriately considered in terms of absolute noise levels, duration and context rather than calculated changes in road traffic noise metrics, with effects addressed qualitatively and through a CTMP?

Q9.3 Is it agreed that operational wind turbine noise should be assessed in accordance with ETSU-R-97 and the IOA Good Practice Guide, following completion of a site-specific baseline noise survey agreed with EAC?

Q9.4 Is it agreed that noise-sensitive receptors may be scoped out of detailed operational noise assessment where predicted cumulative turbine noise levels are below 35 dB L_{A90}, or otherwise where the Proposed Development acting alone contributes less than 25 dB L_{A90} at a receptor?

Q9.5 Is it agreed that operational noise from non-turbine infrastructure (e.g. substations, transformers, energy storage) can be scoped out of detailed assessment where no such infrastructure is located within 500 m of any noise-sensitive receptor, and otherwise assessed in accordance with BS 4142:2014+A1:2019?

Q9.6 Is it agreed that cumulative operational noise assessment should be limited to wind energy developments that are operational, consented, or sufficiently progressed through the planning system, and which are predicted to contribute materially to noise levels at receptors (i.e. ≥25 dB L_{A90})?

Q9.7 Is it agreed that the following topics can be scoped out, on the basis that they do not give rise to a credible pathway to significant effects:

a) construction vibration;

b) operational vibration;

c) low-frequency noise and infrasound;

d) acoustic characteristics (tonality and amplitude modulation), to be addressed through post-construction compliance and planning conditions; and

e) operational maintenance noise.

10.0 Access, Traffic and Transport

10.1 Introduction

This chapter of the Scoping Report outlines the proposed method to assess the potential effects associated with access, traffic and transport by the vehicle movements generated during the construction and operation of the Proposed Development.

The assessment of the effects of these vehicle movements will follow the guidance in the Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement, July 2023[78][79]. The method will involve:

- establishing the environmental baseline;
- identifying potential sources of impact;
- quantifying impacts;
- assessing effects;
- identifying mitigation;
- assessing cumulative impacts; and
- identifying residual impacts.

The assessment will also be informed by Scottish Renewables' Guidelines on Streamlining Environment Impact Assessment for Onshore Wind Farms[80], Transport Scotland's document Transport Assessment Guidance[81] and the Scottish Government's document Planning Advice Notice: PAN 75 – Planning for Transport[82].

10.2 Baseline

The study area for the assessment will comprise the public road network likely to be used by vehicles travelling to and from the Proposed Development. The extent of the study area will be determined through assessment, but it is likely to comprise the following sections of road:

- the A70 between the access to the Proposed Development and Junction 12 of the M74;
- the A70 between the access to the Proposed Development and Dettingen Roundabout on the A76; and
- the sections of the A76 to the immediate north and south of Dettingen Roundabout.

The assessment will also consider the effects of the vehicles delivering the turbine components and that will cover a wider area than listed above, as it will include the route between the Proposed Development and the nearest suitable port.

The Proposed Development would be accessed from the existing access from the A70 to the former Dalfad Opencast Mine. The A70 in the vicinity of this access is generally bordered by

[78] The IEMA was renamed as The Institute of Sustainability and Environmental Professionals (ISEP) in July 2025

[79] Davis, S., Hoare, D., Howard., R., Ross, A. (2023) Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Road Traffic and Movement. London: IEMA.

[80] Scottish Renewables (2025). Guidelines on streamlining Environmental Impact Assessment for Onshore Wind Farms. Scottish Renewables.

[81] Transport Scotland (2012). Transport Assessment Guidance. Glasgow: Transport Scotland.

[82] Scottish Government (2005) Planning Advice Notice: PAN 75 – Planning for Transport. Edinburgh: The Scottish Government.

open farmland, with occasional homes, fields, farms and other developments taking direct access from it.

To the east of the existing access, the A70 passes through Muirkirk, Glespin and Douglas. Receptors along this section include homes fronting the A70, Muirkirk Primary School (which fronts the A70, although it is accessed from a side road), Muirkirk town centre (as defined by the East Ayrshire Council (EAC) Local Development Plan (LDP) 2) and Douglas Local Centre (as defined by the South Lanarkshire Council (SLC) LDP2).

To the west of the existing access, the A70 passes through Lugar and Cumnock. Receptors along this section include homes fronting the A70 and Cumnock town centre (as defined by the EAC LDP2).

The A70 is a single carriageway road with one lane in each direction although a right turn lane is provided at the existing access and turning lanes are provided at some other junctions. It is generally subject to a 60mph speed limit (lower limits for some vehicle types[83]) but lower limits apply through built-up areas.

There are generally no footways on the A70 as it passes through rural areas. There are footways through the built-up areas, as well as other measures to aid pedestrians such as signalised pedestrian crossings. The A70 does not form part of the National Cycle Network (NCN).

A Core Path in EAC's network runs alongside the A70 for around 250 m at Nether Wellwood, around 2.75 km to the east of the access to the Proposed Development. Core Path CL/3456/1 in SLC's network crosses the A70 in the vicinity of Glenbuck Loch and Core Path CL/3328/1 runs alongside the A70 east of Douglas.

The A76 is a single carriageway road with one lane in each direction, although with additional lanes at some junctions. It is subject to a 60mph speed limit in the vicinity of the A70, with lower limits applying to some vehicle types[83]. The A76 is a trunk road and so is managed by Transport Scotland (TS). In the vicinity of the A70, it passes through open farmland and has no direct access (other than occasional field access).

The A70 and A76 are classed as 'Agreed Routes' in the Timber Transport Forum's 'Agreed Routes Map for Timber Transport'[84]. An 'agreed route' is defined as "*Roads which can be used for timber haulage without restriction other than as regulated by the Road Traffic Act 1988*". Many vehicles involved in timber haulage would be Heavy Goods Vehicles (HGVs) so it is reasonable to consider that these sections of road are suitable for HGV usage.

Vehicle movement data will be collected for the A70 by undertaking week-long Automatic Traffic Counts (ATCs). The locations of these ATCs will be determined through the assessment but would likely be on the A70 at a location in Cumnock and at a location to the east of the Proposed Development. These will give data on vehicle volumes, types and speeds.

Vehicle movement data for the A76 will be collated from TS's National Traffic Data System (NTDS) for the following two sites:

- ATCSW005 A76 Cumnock/Auchinleck Bypass-between A70 and B7083 (N); and
- ATCSW005 A76 Cumnock/Auchinleck Bypass-between B7083 (S) and A70.

A 'low' growth factor from the National Road Traffic Forecasts (NRTF) dataset will be applied to the observed vehicle movement data to allow for traffic growth to the year when construction of the Proposed Development could be expected to commence.

[83] Speed limits - GOV.UK

[84] Agreed Route Map for Timber Transport Forum

Data on accidents will be collated from the Department for Transport's (DfT's) Mapping Application for Visualising Road Injury Casualties (MAVRIC). The presence of Core Paths and other facilities for non-motorised users in the study area will be established from mapping from EAC and SLC and from visiting the Site.

10.3 Scope of Assessment and Method

10.3.1 Sources of Impact

The Proposed Development would generate vehicle movements during construction by staff travelling to and from it and plant, components, materials and supplies being delivered to or removed from it. This would lead to additional cars, vans, Light Good Vehicles (LGVs) and HGVs on the road network.

The number of typical daily construction-related vehicles that will be generated during each week or month of the construction phase will be estimated. These estimates will reflect the activities that would take place during the various parts of the construction phase and the amount of materials and number of items of equipment that would need to be delivered to or removed from the Proposed Development.

The number of staff likely to be present during each week or month of the construction phase will be estimated based on experience of other similar developments and the phasing plan for the Proposed Development.

Professional judgement will be applied to estimate the routes taken by vehicles travelling to and from the Proposed Development.

The delivery of the turbine components during construction would require Abnormal Indivisible Load Vehicle (AILV) movements as some of the vehicles carrying to components would have at least one dimension that does not comply with the maxima in The Road Vehicles (Construction and Use) Regulations 1986. A report will be prepared to consider the potential routes for these AILVs and this report will be included as a Technical Appendix to the EIA Report. The effects of the passage of these AILVs will be considered in the assessment.

The additional traffic expected to be generated by the Proposed Development will be compared to the baseline traffic flows and the percentage increase in all vehicles and in HGVs only will be calculated. These increases will then be reviewed against the IEMA Guidelines, which state:

"Following the determination of a study area, it is recommended the competent traffic and movement expert applies two broad rules of thumb as criteria to assist in delimiting the scale and extent of the environmental assessment:

Rule 1 Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%)

Rule 2 Include highway links of high sensitivity where traffic flows have increased by 10% or more."

It is proposed that sections of road will be identified as being of 'high sensitivity' (i.e. subject to Rule 2 above) if they are subject to substantial use by sensitive groups (e.g. children, elderly or mobility impaired) or they are at sensitive locations (e.g. fronted by schools, hospitals or care homes). The baseline study work referred to in **Section 10.2** will have established which sections of road within the study area could be classified as being of 'high sensitivity'. All other sections of road would be subject to the threshold in Rule 1.

Where the estimated increase in traffic arising from the Proposed Development does not breach the relevant threshold for any section of road, the significance of any effects would be

considered to be low and not significant in EIA terms. No further assessment work would be undertaken on such sections.

10.3.2 Assessment of Effects

Where the estimated increase in traffic arising from the Proposed Development breaches the relevant threshold for any section of road, potential effects on the following would be assessed:

- severance;
- road vehicle driver and passenger delay;
- non-motorised user delay;
- non-motorised user amenity;
- fear and intimidation of and by road users;
- road user and pedestrian safety; and
- hazardous / large loads.

The magnitude of impact of each of these effects would be determined based on the criteria in **Table 10.1.**

Table 10.1 Categorisation of Impact Magnitude by Potential Effect

Effect	Impact Magnitude			
	Large	Medium	Small	Negligible
Severance	Change in road link traffic flow of 90% or over.	Change in road link traffic flow of 60% to less than 90%.	Change in road link traffic flow of 30% to less than 60%.	Change in road link traffic flow of less than 30%.
Road Vehicle Driver and Passenger Delay	Judgement based on the individual characteristics of sections of road.			Change in road link traffic flow of less than 10%.
Non-Motorised User Delay	Judgement based on the individual characteristics of sections of road.			Change in road link traffic flow of less than 10%.
Non-Motorised User Amenity	Judgement based on the individual characteristics of sections of road. Medium or Large likely if change in total traffic flows or HGV flows of more than 100%.			Change in total traffic flows or HGV flows of less than 10%.

Effect	Impact Magnitude			
	Large	Medium	Small	Negligible
Fear and Intimidation of and by Road Users	Two changes in 'Level of fear and intimidation'.	One change in level of fear and intimidation with >400 vehicle increase in average 18 hour (hr) vehicle flow or >500 Heavy Vehicle (HV) increase in total 18hr HV flows.	One change in level of fear and intimidation with <400 vehicle increase in average 18hr vehicle flow or <500 HV increase in total 18hr HV flows.	No change in Level of fear and intimidation.
Road User and Pedestrian Safety	Judgement based on accident data and individual characteristics of sections of road.			Change in road link traffic flow of less than 10%.
Hazardous / Large Loads	Judgement based on number of such movements and nature of affected road network.			

However, there may be instances where, for example, a relatively low increase in vehicle movements results in a relatively large percentage increase simply because the baseline vehicle movements may breach one of the thresholds in **Table 10.1**, but, in absolute terms, may be considered to have a lesser impact magnitude. Professional judgement will be used in the application of the thresholds in **Table 10.1**.

10.3.3 Receptor Sensitivity

Receptor sensitivity would be defined as shown in **Table 10.2**.

Table 10.2 Receptor Sensitivity Definitions

Sensitivity	Description
Very high	Receptor with no capacity to accommodate a particular effect and no ability to recover or adapt.
High	Receptor with very low capacity to accommodate a particular effect with low ability to recover or adapt.
Moderate	Receptor with low capacity to accommodate a particular effect with low ability to recover or adapt.
Low	Receptor has some tolerance to accommodate a particular effect or will be able to recover or adapt.
Negligible	Receptor is generally tolerant and can accommodate a particular effect without the need to recover or adapt.

Professional judgement will be used in the application of the definitions shown in **Table 10.2**. For example, pedestrians may be less sensitive to severance effects if there are measures in place to aid pedestrians crossing the road. This is acknowledged in paragraph 1.31 of the IEMA Guidelines which states "*For example, pedestrians are less sensitive to changes in traffic if there are adequate footways and crossing facilities".*

10.3.4 Significance Criteria

An effect significance matrix based on the impact magnitude and receptor sensitivity is set out in **Table 10.3**.

Table 10.3 Effect Significance

Impact Magnitude	Sensitivity of Receptor				
	Very High	High	Moderate	Low	Negligible
Large	Major	Major	Major	Moderate	Negligible
Medium	Major	Major	Moderate	Minor	Negligible
Small	Moderate	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Effects of 'Major' significance will be considered to be 'significant' in terms of the EIA Regulations. Effects of 'Moderate' significance will be considered to be either 'significant' or 'not significant` in terms of the EIA Regulations and professional judgement used to determine the level of significance. Effects of 'Minor' or 'Negligible' significance will be considered to be 'not significant' in terms of the EIA Regulations.

10.3.5 Mitigation

Mitigation measures would be proposed to lessen any effects of the vehicle movements generated by the Proposed Development. These would be developed in accordance with the guidance in the 'IEMA Impact Assessment Guidelines: Implementing the Mitigation Hierarchy from Concept to Construction' of August 2024[85], which identifies the following three types of mitigation:

- Primary mitigation, which are measures that are an inherent part of the project design (such as borrow pits) to reduce the amount of aggregate that would need to be brought in from off-site sources).
- Secondary mitigation, which are measures that require further activity in order to achieve the anticipated outcome and are often secured through planning conditions, requirements and/or management plans (for example a Construction Traffic Management Plan (CTMP)).
- Tertiary mitigation, which are measures which would be required regardless of any EIA assessment, as they are measures which are imposed, for example, as a result of legislation or standard practices.

[85] Beadle, Burgess, Callaghan, Howard, Knott, Riley, Walker et al. (2024) Institute of Environmental Management and Assessment (IEMA) Guidelines: Implementing the Mitigation Hierarchy from Concept to Construction. London: IEMA

Measures such as the use of borrow pits (if applicable) and a CTMP would be considered as embedded mitigation and the assessment of effects would be undertaken based on these measures being in place.

10.3.6 Cumulative Effects

A cumulative assessment will be undertaken to determine the increase in vehicle movements arising from the Proposed Development and any other developments that would affect the same sections of the road network at around the same time as the Proposed Development would be constructed. The significance of cumulative effects will be assessed using the same process as described above.

10.4 Issues Scoped Out

Transport demand during operation would likely be much lower than during construction, since during operation there would be only occasional visits from maintenance or inspection vehicles. It is proposed, therefore, that the transport impacts of the Proposed Development once it is fully operational are scoped out of the assessment.

10.5 Questions to Consultees

Q10.1 Is the proposed methodology acceptable?

Q10.2 Are there any key locations on the road network within the study area that consultees would wish to see considered as sensitive receptors?

Q10.3 Are there any locations on the road network within the study area with atypically- high accident rates?

Q10.4 Are there any particular committed developments that consultees would wish to see included in the cumulative assessment.

11.0 Aviation and Radar

11.1 Introduction

This chapter provides an indication of the potential effects of the construction and operation of the Proposed Development on aviation. Further, it provides a summary of the full assessment methodology to be adopted and the key reference documents covering legislation, policy and guidance.

11.2 Guidance and Legislation

The primary planning policy document is the National Planning Framework 4 (NPF4) (February 2023).

NPF4 states, under Policy 11 concerning development proposals for all forms of renewables, that project design and mitigation will demonstrate how "*impacts on aviation and defence interests and seismological recording*" are addressed.

Scottish Onshore Wind Policy Statement states (December 2022), under Chapter 6, that wind turbines have the potential to affect aviation operations, including, but not limited to, effect on aviation radar.

The effects of Wind Turbine Generators (WTG) on aviation interests have been widely publicised, but the primary concern is one of aviation safety alongside environmental effects. There are two dominant scenarios that may lead to objections from aviation stakeholders:

a) Physical Obstruction: WTGs can present a physical obstruction at or close to an airfield or in the military Low Flying environment; and

b) Radar/Air Traffic Services: WTG induced clutter appearing on radar display can affect the safe provision of air traffic services as it can mark unidentified aircraft from the air traffic controller and/or prevent them from accurately identifying aircraft under their control.

The document recognises recent progress stating that bespoke solutions which alleviated specific, individual objections have been deployed successfully over the last decade or more, releasing significant volumes of renewable generation. However, the pace of deployment necessitated by the climate emergency means we must find a way to alleviate these impacts in an effective, efficient and timely manner. It is also important that solutions are cognisant of the cost of deploying renewable energy, particularly given the need to focus on both security of supply and low-cost generation, given the current international and economic situation.

Beyond the above statement of need, the document sets out the aims of Industry and Government to address the issues of radar impacts, creation of a physical obstruction and aviation obstacle lighting fitment; specifically, the Onshore Wind Aviation Radar Delivery 2030 group and the Aviation Lighting Working Group. The Guidance on Aviation Lighting Impact Assessment (November 2024) focusses on delivering consistent methods, practices and recommendations to aid in assessing aviation obstacle lighting impacts. The draft guidance is out to consultation with relevant stakeholders, with a final version expected in due course.

Planning Circular 2/03, Safeguarding of Aerodromes, Technical Sites and Military Explosives Storage Areas, contains annexes which describe the formal process by which planning authorities should consider safeguarding, including in relation to wind energy developments. As a statutory consultee, the Ministry of Defence (MOD) will be consulted through the Section 36 scoping application. It publishes a guidance document on www.gov.uk called 'Wind farms: MOD safeguarding', updated 21 July 2021. They state that WTGs can adversely affect several MOD operations including radars, seismological recording equipment, communications

facilities, naval operations and low flying. These effects are not limited to specific geographical areas.

The MOD wind energy team deals specifically with wind-related developments and processes planning applications and pre-application consultation requests for on- and offshore wind farm developments The MOD wind energy team also liaises with a broad range of experts to formulate a comprehensive MOD response. Where the MOD has concerns about a development the team will work with the developer to look for ways to mitigate them.

Civil Aviation Authority (CAA) guidance, within Civil Aviation Publication (CAP)764 (*Policy and Guidance on Wind Turbines*), sets out recommended consultation and assessment criteria for the impacts of WTGs on all aspects of civil aviation.

The CAA involvement in the Wind Farm Pre-Planning Consultation Process has ceased; CAP764 now states that 'developers are required to undertake their own pre- planning assessment of potential civil aviation related issues' and that 'it is incumbent upon the developer to liaise with the appropriate aviation stakeholder to discuss – and hopefully resolve or mitigate – aviation related concerns without requiring further CAA input.'

11.3 Study Area

The initial aviation impact assessment aims to exhaustively identify all potential issues and the associated aviation stakeholders potentially affected by the Proposed Development. This involves considering all military and civil aerodromes in the wider area out to circa 60 km, all radar installations out to the limit of their range, all navigational aids and air-ground-air communications stations to the limit of their safeguarding areas and low flying activities in the airspace above and around the Proposed Development.

11.4 Baseline Description

The aviation facilities likely to be affected by the Proposed Development are:

a) National Air Traffic Services En-Route Plc (NERL), Lowther Hill Primary Surveillance Radar (PSR) and Secondary Surveillance Radar (SSR);

b) Glasgow Prestwick Airport (GPA);

c) GPA Very High Frequency (VHF) Communications;

d) MOD Low Flying; and

e) Glasgow Airport and GPA Instrument Flight Procedures (IFPs).

Based on our understanding of the effect of WTGs on aviation infrastructure in this area, we believe that industry standard mitigation solutions can be agreed and implemented such that the Proposed Development will have no residual significant effects on aviation.

The Proposed Development lies outside the GPA Control Zone (CTR). This is an area of Controlled Airspace (CAS), dedicated to aircraft flying into and out of the airport. The Proposed Development lies at a range of approximately 21 km, east of the Aerodrome Reference Point (middle of the GPA main runway), to the north of extended centreline of the main runway.

Because of the proximity of the Site to GPA, combined with the elevation of the terrain, there is the potential for WTGs to have an effect as physical obstacles, upon aspects of flight procedures. The Applicant will work with a CAA Approved Procedure Design Organisation (APDO), to identify and address any conflicts with current procedures.

The WTGs might be detectable to the GPA Primary Surveillance Radar (PSR). Mitigation of the PSR impacts might be required and is available.

The WTGs might also be detectable to and cause effects to the NATS En-route PSR at Lowther Hill, 22 km to the southeast. These effects, if any, can be mitigated.

No negative effects are anticipated on Navigational Aids (NAVAIDS) or military infrastructure.

In line with the Scottish Renewables guidance on streamlining wind farm EIAs, an Aviation Assessment of the Proposed Development will be undertaken and submitted as a Technical Appendix to the EIA Report. It will assess the effect of the Proposed Development on aviation infrastructure and set out mitigation as required. Planning conditions will be proposed as part of the planning application to ensure that any mitigation is delivered.

Due to the height of the WTGs, greater than 150 m, some might be required to be lit, under CAA Regulations, with visible aviation obstacle lighting. Details of this will be set out in the description of development section of the EIA Report and its impact assessed as part of the Landscape and Visual Impact Assessment (LVIA). In accordance with “Guidance on Aviation Lighting Impact Assessment” (NatureScot 2024), the LVIA will assess the additional visual effects of the aviation lighting in the main body of the LVIA chapter.

The surrounding landscape context of the Proposed Development contains some existing sources of artificial aviation obstacle lighting, particularly when considering surrounding wind farms already consented with visible aviation obstacle lighting.

The MOD is expected to request Infra-red lighting. Infra-red lighting will be provided, the details of which will be agreed with the MOD prior to implementation. This lighting is invisible to the human eye.

11.5 Proposed Scope and Methodology of Assessment

The acceptability of the Proposed Development, in terms of net effects on aviation related interests, is established through engagement with all relevant stakeholders within the consenting process. The initial task is to independently assess the potential effects and where significant effects might occur, to design the Proposed Development to minimise those negative effects and as required, to enter a dialogue with the affected stakeholders. The initial assessment includes a review of the following:

Airspace environment:

a) Proximity to aerodromes.
b) Airspace Class – Proximity to Air Traffic Service (ATS) routes.
    i. CAS, Restricted Areas.
c) Proximity to military aeronautical training areas.

Checks for physical obstruction:

a) Through an infringement of Obstacle Limitation Surfaces (OLS).
b) Potential for penetration of IFP safeguarding surfaces.

Radar Line of Site (LoS) overview for the following radar:

a) NATS En-route PSR and SSR.
b) GPA PSR.

Proximity to other technical sites:

a) NAVAIDs.
b) Air-ground-air-comms locations operated by NATS En-Route and GPA.

Where negative effects are of concern, additional analysis may be required, and where negative effects are deemed unacceptable, mitigation solutions will be identified and explored

with the goal of reducing negative effects to acceptable levels. While the aim of this dialogue is to enable the approval of all aviation stakeholders before full submission, this is not always possible. In the case of negative effects, typically solutions are identified but do not reach full maturity in terms of the assessment by the aviation stakeholders and the contracting of mitigation (where required) until full planning applications have been submitted.

11.6 Proposed Mitigation

Radar Mitigation Schemes (RMS) might be required to mitigate the impacts to the NATS En-route Lowther Hill radar and the GPA PSR.

Mitigation schemes have been agreed on other projects in the immediate area, including for the consented North Kyle Energy Project (ECU reference ECU00001950). The same mitigation could readily be applied to the Proposed Development.

Subject to a full assessment of the final layout by an APDO, some amendments to IFPs might be required. Any such changes will be conducted through the airport to the point of CAA approval and implementation prior to project build.

11.7 Potential Residual Impacts

There will be no residual aviation impacts.

11.8 Receptors and Impacts Scoped In or Out of Assessment

Technical reporting will be provided as a supporting appendix to the EIA Report as part of Volume 4: Technical Appendices. Impacts on aviation do not require to be assessed through the EIA process in an EIA Report chapter.

Potential aviation effects, none expected, to NAVAIDs will be scoped out by the Applicant. However, the aviation stakeholders consulted will conduct or stipulate an assessment of all potential areas of effect, independent of any assessment conducted by the Applicant.

11.9 Questions to Consultees

Q11.1 – Do you agree that impacts on aviation can be assessed within a technical report provided as an appendix to the EIA Report?

Q11.2 – Do you agree with the proposed consultation strategy, assessment methodology, and approach to potential mitigation of impacts?

12.0 Telecommunications & Utilities

12.1 Telecommunications

12.1.1 Baseline

A desktop assessment was undertaken to determine whether any telecommunications fixed links were present within or near the Site. Publicly available information[86] showed that there is a fixed link travelling in a northwest to southeast direction across the northern part of the Site as shown on **Figure 12.1**.

In addition, as part of the desktop baseline study, the following consultees were contacted to enquire whether any of the Scoping Layout turbines would affect or infringe on any telecommunications fixed links within or near the Site:

- Arqiva;
- Atkins;
- BT;
- EE;
- Joint Radio Company (JRC);
- Telefonica; and
- Vodafone.

All of the above confirmed that there were no telecommunications fixed links within or near the Site, with the exception of Vodafone which has a fixed link which crosses the Site – this serves as confirmation that the fixed link identified during the desk study is operated by Vodafone.

12.1.2 Potential Impacts of Wind Turbines on Telecommunications Links

Wind turbines can introduce electromagnetic signal interference due to both physical and electrical factors. Physical interference can disrupt electromagnetic signals, leading to a ghosting effect that particularly impacts television and radar. Electrical interference stems from the operation of the generator within the turbine's nacelle and may affect communication equipment near the turbines.

12.1.3 Mitigation Through Design

In their response (dated 20/10/2025), Vodafone advised that they require 100 m clearance between the fixed link path centre and the turbine blade tip. In response, during the design of the Scoping layout, a 181 m avoidance buffer was applied to either side of the fixed link. This has been treated as a hard constraint and all turbines have been sited outside of this avoidance buffer – see inset of **Figure 12.1**.

12.1.4 Proposal to Scope Out of EIA

The treatment of the fixed link as a hard constraint and the avoidance of the fixed link path in compliance with the operator's requirement effectively removes any potential for the Proposed Development to impact on the telecommunications link. It is therefore proposed that the

[86] Ofcom Spectrum Information Portal. https://www.ofcom.org.uk/spectrum/frequencies/spectrum-information-portal [Accessed 15/01/2026]

telecommunications providers listed in **Section 12.1.1** be reconsulted once a final design is available to check whether the Proposed Development will impact on any fixed links, and if not, then an assessment of potential impacts on fixed links will be excluded from the EIAR, and a brief description of the presence of the telecommunications link within the Site and how it was avoided will be included in the Design Evolution chapter of the EIAR.

However, should a new fixed link or new potential impacts be identified by the telecommunications operators at final design stage, a discussion of the baseline, potential impact and mitigation will be included in the EIAR as a technical appendix, rather than an EIAR chapter. This is in line with the Guidelines on Streamlining EIA for Onshore Wind Farms (Scottish Renewables, September 2025).

12.1.5 Questions to Consultees

Q12.1 Should any telecommunications fixed links be present within or near the Site which have not already been identified, please could these be provided?

Q12.2 Do consultees agree that as long as no new potential impacts on telecommunications fixed links arise as a result of the final design, assessment of potential impacts on fixed links can be scoped out of the EIAR altogether, with only a brief description of the link present on-site and measures taken to avoid it described in the Design Evolution chapter of the EIAR.

Q12.3 Do consultees agree that if at final design, it becomes evident that there will be an impact on any telecommunications links, potential effects would be described in a technical appendix of the EIAR?

12.2 Utilities

At this stage, the Applicant is aware of two overhead lines within the Site. Further baseline information will be obtained from other utility providers e.g. Scotland Gas Networks (SGN) during the design process to ensure any underground gas lines are protected. Further information on the results of the baseline utilities search will be provided in the Design Evolution chapter of the EIAR

12.2.1 Baseline

A single wood pole overhead line runs within the Site in a northeast-southwest direction for approximately 1.5 km. See **Figure 12.2** below.

Another single wood pole overhead line runs within the Site near the southwestern boundary and branches off along the existing access track to High Glenmuir (see **Figure 12.3**, below). It is likely this overhead line provides electricity to High Glenmuir and the surrounding properties.

There are no other overhead lines within the Site.

Figure 12.2: Image of single wood pole overhead line where it crosses over the A70 Muirkirk Road, photo facing southwest (Google Maps Streetview, accessed 15/01/2026)

Figure 12.3: Image of single wood pole overhead line where it follows the access track to High Glenmuir, photo facing northeast (Google Maps Streetview, accessed 15/01/2026)

12.2.2 Potential Impacts of Wind Turbines on Overhead Lines

It is currently understood that wind turbines have the potential to impact on overhead lines as follows:

- Potential toppling of the turbines in the direction of the overhead line would damage the overhead line; and
- Wind roses coming off the turbine blades during operation of wind farms have the potential to cause overhead lines to sway, which reduces the life of the cables and requires more frequent maintenance and replacement of the cables.

12.2.3 Mitigation Through Design

The most effective way to eliminate the potential for the Proposed Development to impact on existing overhead lines is to implement appropriate avoidance buffers. A topple distance buffer of tip height plus 10% (220 m) will be applied to all existing surface infrastructure including overhead lines, roads and buildings. Where this is not possible, the transmission operator (in this case Scottish Power Energy Networks (SPEN)) will be contacted to discuss potential mitigation options.

Should any underground infrastructure be identified while establishing the utilities baseline, appropriate avoidance measures will be put in place, in consultation with the applicable utilities operator. Where it is not possible to avoid any underground infrastructure that might be present, the utilities operator will be contacted to discuss potential mitigation options.

12.2.4 Proposal to Scope Out of EIA

It is proposed that a discussion of the presence of any existing utilities infrastructure, along with a discussion of the measures implemented through design to mitigate or eliminate potential impacts on the infrastructure, will be included in the Design Evolution chapter. Where any technical mitigation measures are required to address potential impacts of the Proposed Development on existing utilities infrastructure, this will be addressed in technical report(s) to be appended to the EIAR, and will not be addressed in a chapter of the EIAR.

Furthermore, separately to the EIA process, a design risk register is being kept up to date and overseen by the Principal Designer through the design process in line with the requirements of the Construction (Design and Management) Regulations (2015).

12.2.5 Questions to Consultees

Q12.4 Should consultees be aware of any utilities infrastructure within or near the Site, please could this be provided?

Q12.5 Do consultees agree that a description of any infrastructure present within the Site and mitigation through design would be included in the Design Evolution chapter of the EIAR?

Q12.6 Do consultees agree that if required, potential effects would be described in a technical report to be appended to the EIAR?

13.0 Shadow Flicker

13.1 Introduction

This section considers shadow flicker, which is an effect caused by the rotation of the turbine blades when the sun is shining, which can create a flickering or strobe-like effect. It can be distracting and disturbing for people who are affected. Effects usually occur when the frequency of the flicker is less than 1.5 Hz.

13.2 General Approach to Assessment

There are at present no formal guidelines available on what exposure would be acceptable in relation to shadow flicker. There is no standard for the assessment of shadow flicker. The specific advice sheet from Scottish Government, Onshore Wind Turbines, a web-based guide (Scottish Government, 2014) sets out the potential geographic area which may fall under assessment: "*Where this (shadow flicker) could be a problem, developers should provide calculations to quantify effect. In most cases however, where separation is provided between turbines and nearby dwellings (as a general rule ten rotor diameters), 'shadow flicker' should not be a problem*."

Published research by the Department of Energy and Climate Change (DECC), Update of UK Shadow Flicker Evidence Base (DECC, 2011), evaluates the current international understanding of shadow flicker and confirms an acceptable study area for assessment is ten rotor diameters from each turbine and within 130 degrees either side of north. In the same publication, the DECC stated that effects are considered to be significant where a receptor is identified as experiencing greater than 30 hours of flicker a year or more than 30 minutes per day on the worst affected day (based on the realistic scenario), whichever is greater.

The EAC considers any level of shadow flicker to be significant and expects it to be treated as such, regardless of other guidance on this matter. As such, any shadow flicker expected to be experienced at any of the receptors will be regarded as significant in EIA terms.

13.3 Initial Shadow Flicker Assessment

As detailed above, the shadow flicker study area includes land within a distance of 10 times the rotor diameter of the candidate turbine and 130 degrees either side of north for each turbine. As shown on **Figure 13.1**, there are residential properties located within these defined areas.

Initial assessment of the potential for shadow flicker effects on residential receptors within the study area, based on the Scoping layout (see **Figure 13.2**), indicated that only one residential property, namely High Glenmuir, would experience levels of shadow flicker higher than 30 hours per year[87]. However, this property will be vacated prior to the commencement of construction, will remain vacant for the life of the Proposed Development and is therefore not a concern. All other properties within the study area will experience shadow flicker levels of below 30 hours a year, even when taking potential cumulative shadow flicker from adjacent proposed developments into account (see **Figure 13.3**).

13.4 Proposed Mitigation

The Applicant is committed to minimising the potential for shadow flicker effects of the Proposed Development to impact on residential receptors. The Applicant proposes that prior to the erection of the first turbine a written scheme (known as the 'Wind Farm Shadow Flicker

[87] Department of Energy and Climate Change (DECC), 2011. Update of UK Shadow Flicker Evidence Base.

Protocol') will be submitted to and approved in writing by the Local Planning Authority. This will set out mitigation measures to alleviate shadow flicker attributable to the Proposed Development as well as a protocol for addressing a complaint received from a receptor within the Study Area.

Operation of the turbines would be required to take place in accordance with the approved Shadow Flicker Protocol and any mitigation measures that have been agreed through the protocol would require to be implemented as appropriate.

Mitigation measures could include the provision of local screening to reduce or block shadow flicker affecting a receptor. Should screening provision not be possible, the most effective mitigation measure to mitigate shadow flicker is by selective automatic turbine shutdown during the times of year when shadow flicker is predicted, if the weather conditions are correct. The relevant technology which will allow for the automatic shutdown of the turbine will be fitted to the Proposed Development turbines and details included within the 'Wind Farm Shadow Flicker Protocol'.

13.5 Proposal to Scope Out of EIA

Considering the Applicant will implement appropriate shadow flicker mitigation measures, which are to be agreed with the EAC ahead of erection of the first wind turbine, at all residential properties that could potentially be affected, it is proposed that shadow flicker be scoped out of the EIA[88], but that a list and location plan of the properties which could potentially be affected will be included as an appendix of the EIAR.

13.6 Questions to Consultees

Q13.1 – Do you agree with the study area outlined above?

Q13.2 – Do you agree that shadow flicker can be scoped of the EIA with potential effects and any mitigation measures set out in a technical appendix to the EIA Report?

[88] This is in line with the recommendations of the Guidelines on Streamlining EIA for Onshore Wind Farms (Scottish Renewables, September 2025.

14.0 Air Quality & Human Health

The air quality of the Site is expected to be good due to the rural location, with few pollution sources. The main pollution source is likely to be local emissions from traffic on the A70.

During the construction of the Proposed Development, the movement of vehicles and the on-site plant would generate exhaust emissions. Given the short-term nature of the construction period and the limited area to be developed, effects on air quality are likely to be negligible.

Construction activities have the potential to generate dust during dry spells, which may adversely affect local air quality. Given the scale, nature and duration of construction activities, it is considered that dust from construction is unlikely to cause a nuisance, particularly with the implementation of standard mitigation measures as detailed in a CEMP, e.g., wheel washes; dampening of loads.

An operational wind farm produces no notable atmospheric emissions. The operation of the wind farm would therefore have no discernible adverse effects on local or national air quality.

Relevant mitigation measures for air quality, dust and pollution control will be captured within the site-specific CEMP.

The assessment of human health effects will be undertaken in the context of residential amenity (i.e., visual impact, noise and shadow flicker assessments).

It is therefore proposed that an assessment of air quality & human health is scoped out of the EIA.

14.1 Questions to Consultees

Q14.1 – Do consultees agree that air quality and human health can be scoped out of EIA?

15.0 Risk of Major Accidents and/or Disasters

Given the nature of the Proposed Development, the risk of a major accident or disaster is considered to be extremely low. The Principal Designer will ensure a Design Risk Assessment process is followed during the design phase to ensure designers fully assess risks and mitigate to a level deemed as low as reasonably practicable during the design stage as part of the requirements of the Construction (Design and Management) Regulations (2015).

During the operational phase of the Proposed Development, routine maintenance inspections will be completed in order to ensure the safe and compliant operation of all built infrastructure.

It is therefore proposed that an assessment of the risk of major accidents and/or disasters is scoped out of the EIA.

15.1 Questions to Consultees

Q15.1– Do consultees agree that major accidents and disasters can be scoped out of EIA?

16.0 Summary of EIA Scope

This EIA Scoping Report outlines the proposed technical and environmental assessments that are proposed to be included within the EIA Report for the Proposed Development. **Table 16.1** summarises these and indicates the technical topics which are proposed to be scoped out of the EIA Report. In the preceding sections of this Scoping Report, the proposed scope and methodologies for each assessment have been provided and the guidance to be followed set out. Should any further information be required in order that a full EIA Scoping Opinion can be provided we would be happy to provide further information and/or discuss any further requirements.

Table 16.1: Topics Scoped In and Out of EIA

EIA Topic	Scoped In / Out
Landscape & Visual	Scoped In
Cultural Heritage	Scoped In
Noise	Scoped In
Geology, Hydrogeology, Hydrology & Peat	Scoped In
Ecology	Scoped In
Ornithology	Scoped In
Access, Traffic and Transport	Scoped In
Aviation and Radar	Scoped Out (report to be provided as technical appendix to EIA Report)
Telecommunications and Utilities	Scoped Out (report to be provided as technical appendix to EIA Report if new links or new impacts arise from final layout)
Shadow Flicker	Scoped Out (report to be provided as technical appendix to EIA Report if required)
Air Quality and Human Health	Scoped Out
Risk of Major Accidents and / or Disasters	Scoped Out

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Appendix B Cultural Heritage Appraisal

Table 4: Scheduled Monuments within 10km of the Proposed Turbines

Designation Reference	Designation Title	Category	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
SM6640	Muirkirk, remains of tar works, mines and structures E of Garpel Water	Industrial: mines, quarries	**0-8**	**5.9km**	**Southwest**	The asset is the remains of tar works and mines, along with associated infrastructure, dating to the late 18th century. The asset is situated along the banks of Garpel Water, with the redirected Colt Burn running through its center. The assets setting is functional in nature. The mines would have been placed on coal seam to allow for extraction. The works are placed adjacent to the larger Garpel Water and redirected the nearby Colt Burn to provide water for the works and the workers. The area is able to be viewed and appreciated from the single track roads which run through the asset's south and eastern sections. However, as the asset's setting is purely functional, long distance views do not contribute to the asset's cultural significance. Between 0-8 turbine tips would be visible from the asset, in views to the southwest. These turbine tips would not distract from the ability to understand, appreciate and experience the functional placement of the asset within the landscape and would not impact the asset's cultural heritage significance. As such, the asset is scoped out of further assessment.
SM5405	Chapelhouse, chapel and farmstead	Ecclesiastical: chapel; Secular: farmstead	0-14	4km	South	The asset is a pre-reformation chapel and post-medieval farmstead. The asset is located on the western bank of Greenock Water, on slightly raised ground. The asset's setting comprises its placement alongside the river, which would have allowed access to water for

Designation Reference	Designation Title	Category	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
						agricultural purposes, and likely its secluded placement away from any major towns or villages in the area. This isolation may have been to allow for worshippers to better connect to their religion, to provide a place of worship for those in more remote farmsteads or have been a private chapel for those that constructed it. Long distance views to and from the asset do not contribute to its cultural significance, instead, its isolated nature is best understood from the watercourse to its direct west and when in its immediate landscape. Whilst up to 14 turbine tips are visible from the western side of the asset, with no turbine tips visible from the remaining scheduled area. The inclusion of these tips would not impact the ability to understand, experience and appreciate the asset's setting. As such, it is scoped out of further assessment.
SM5537	Old Foundry Holm, ironworks	Industrial: iron and steel	0-2	3.1km	South	The asset is the remains of an iron smelting works from the early 1700s. The asset's setting is functional, being placed along the southern bank of the River Ayr, which would have provided water for the smelting works, within a wider landscape of coal mining and industrial works. The iron works were sited in this location due to access to the resources it required. As such, long distance views do not contribute to the cultural significance of the asset, as its proximal, rather than visual relationships, to the surrounding mining landscape are important.

Designation Reference	Designation Title	Category	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
						Up to two turbine tips would be visible from the asset, however, these tips would not impact the ability to understand, appreciate and experience the functional setting of the asset. It is scoped out of further assessment.
SM3311	**Kyle Castle,200m E of Dalblair**	**Secular: castle**	**0-14**	**1.8**	**Northwest**	**Scoped In for further assessment.**
SM2469	Glen Garr, cairn	Prehistoric ritual and funerary: cairn (type uncertain)	14	8.4	Southeast	The asset, a prehistoric burial cairn, is located on Glen Garr Hill at approximately 430m AOD. Glen Garr Hill is a summit on the west of a roughly northeast to southwest aligned ridge. A slightly higher summit (434m AOD) lies to the assets east, with higher peaks to the assets north and slightly lower hills to the assets south. Cairns are often located at elevated points within the landscape. As funerary monuments, it is likely that they were intended to be viewed from the surrounding landscape, and have views of the surrounding landscape, potentially acting as a symbolic way of allowing the deceased to watch over ancestral lands or relatives. They also appear to often serve a dual purpose, potentially acting as land or boundary markers. The assets position on the west side of the ridge indicates that views to the west are of the most importance, as views to the east would be limited by topography. The asset has views over lower lying slopes in this direction, which contain several burns such as Cleuch Burn and Burn o' Need. The asset's views to the south would include a second cairn (SM2924), located on Blacksidend Hill, which would likely have shared intervisibility and created a prehistoric funerary landscape.

Designation Reference	Designation Title	Category	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
						Views to the north would be more limited due to the higher hills and undulating topography. The key approach towards the cairn would be along the northeast to southwest aligned ridge, including from nearby Backsidend cairn SM2924, and from the landscape to the west. The ZTV indicates that up to 14 turbine tips would be visible from the asset. These turbines would not be present in views when approaching the cairn from the west, due to the topography, and would not be directly present when approaching the cairn along the ridge, due to the orientation of the Proposed Development away from this field of view. When viewing SM2924 from the asset, the Proposed Development may be present in peripheral views, however, it is unlikely that they would be prominent as Backsidend is orientated to the southwest of the asset, with the Proposed Development located to the southeast. As such, the Proposed Development would not impact any of the key aspects of the asset's setting which contribute to its cultural significance. It is scoped out of further assessment.
SM2924	Blacksidend, cairn	Prehistoric ritual and funerary: cairn (type uncertain)	14	7.6	Southeast	The asset, a prehistoric funerary cairn, is located on Backsidend Hill. It is located at approximately 400m AOD. Cairns are often found located at elevated points within the landscape. As funerary monuments, these features were likely designed to be visible within the surrounding landscape and to command views over it, symbolically allowing the deceased to watch over ancestral lands or kin. They often

Designation Reference	Designation Title	Category	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
						appear to serve a dual purpose, functioning not only as burial markers but also as territorial or boundary indicators. The asset is located on the most southwesterly end of a ridge, which runs roughly northeast to southwest. This position affords the cairn views to the south, over the valley of the River Ayr, however, the river itself may not be visible due to the undulating topography. The cairn visible from areas within the valley below, which would provide a key point of appreciation, however, the undulating landscape means that it is not always visible from the south. The asset is also located c.1.7km southwest of Glen Carr Cairn (SM2469), which would likely have shared intervisibility and created a prehistoric funerary landscape. These aspects of the asset's setting contribute to the asset's cultural significance. Up to 14 turbine tips are anticipated to be visible from the asset, in views to the southwest. They would not be present in views from the asset towards SM2469 or if viewing or approaching the asset from the south, as they would not be within the key viewshed. When viewing the asset from SM2469, the Proposed Development may be present in peripheral views, however, it is unlikely that they would be prominent as Backsidend is orientated to the southwest of the asset, with the Proposed Development located to the southeast. The turbine tips would be present in peripheral views from the asset when looking over the landscape to the south. They would not be directly present within these views and as such

Designation Reference	Designation Title	Category	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
						are unlikely to cause a distraction to the ability to understand, appreciate and experience the assets connection to the lower lying landscape and the River Ayr. As such, the asset is scoped out of further assessment.
SM4631	**Cairn Table, two cairns**	**Prehistoric ritual and funerary: cairn (type uncertain)**	**8-17**	**8.3km**	**West**	**Scoped in for further assessment.**
SM5670	Catrine, water works for Catrine Mill 30m S of 9 St Cuthbert's Street	Industrial: textiles	0-14	9.9km	Southeast	The asset comprises the water management system which supplied the power for Catrine's cotton mills and bleaching works. The asset's setting is functional in nature, placed along the River Ayr, which provided the water source, and to the north of Catrine, where the mills are located. Long distance views do not contribute to the asset's cultural significance and as such, views of the Proposed Development would not impact the ability to understand, appreciate and experience the asset's functional placement and contribution to the industrial activity of Catrine. It is therefore scoped out of further assessment.

Table 5: Category A Listed Buildings within 10km of the Proposed Turbines

Designation Reference	Designation Title	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
LB96	**The Temple, In Policies Of Dumfries House.**	**13**	**8.3km**	**East**	**Scoped in for further assessment**
LB14272	Bridge Over River Ayr, Opposite Sorn Parish Church	5	8.4km	Southeast	The asset is a hump-backed bridge, which spans the River Ayr. The bridge is primarily designated for its architectural value, however it does derive some cultural significance from its setting. The bridge's setting has a functional aspect, allowing the road to pass over the River Ayr, in addition to having an aesthetic aspect, as it is placed at a picturesque bend, allowing for a point of appreciation of the river and the surrounding village. The surrounding vegetation creates a boundary to the edge of these views and creates a feeling of seclusion. Whilst the ZTV indicates that up to five turbine tips would be visible to the southeast in a bare earth scenario, they are unlikely to be visible due to the amount of historic tree and vegetation coverage. Should they be present in views, they would be in the backdrop of views over the secluded river valley. The turbine tips in the back drop of these views would not distract from the ability to understand, appreciate, or experience the asset's functional setting or its picturesque nature. It is therefore scoped out of further assessment.
LB14273	Sorn Castle	**8**	**8.6km**	**Southeast**	**Scoped in for further assessment.**
LB14274	Stables, Sorn Castle	11	8.9km	Southeast	The asset comprises the stables for Sorn Castle (LB14274), which lie c.275m to the southeast. They are primarily designated due to their architectural interest, as a very well-preserved classical courtyard range from 1830-1840. The setting of the stables comprises the historic estate associated with Sorn Castle. As a functional building, visual connection between the stables and the other parts of the estate was unlikely a key focus, however, there are views between the stables and the castle to the

Designation Reference	Designation Title	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
					southeast. The stables are accessed from the northwest via a driveway, indicating that this is the key approach and point of appreciation for the architecture of the stables. Whilst it is anticipated that up to 11 turbine tips would be visible from the asset, views of these turbine tips in the distance would not impact the ability to understand, appreciate and experience the architectural value of the asset, nor distract from the ability to understand, appreciate, and experience the position of the stable within the historic estate. It is therefore scoped out of further assessment.
LB14413	**Dumfries House**	**14**	**8.2km**	**East**	**Scoped in for further assessment.**
LB14414	**Avenue Bridge, Dumfries House Policies**	**14**	**8.5km**	**East**	**Scoped in for further assessment.**
LB14416	**Dovecote Dumfries House**	**0-14**	**8.4km**	**East**	**Scoped in for further assessment.**
LB24093	Mercat Cross, The Square	11	5.8km	East	The asset is a mercat cross, no longer in its original position, which occupies the town square in Cumnock. The mercat cross would have originally noted the location for a regular market or fair, and would have been a community gathering point for other occasions. Whilst the cross has moved from its original spot, the assets setting is similar, acting as a focal point in the heart of the village. External and long distance views from the cross do not contribute to the asset's setting. As such, any visibility of the proposed turbines would not impact on the ability to understand, appreciate and experience the asset within its setting. It is scoped out of further assessment

Designation Reference	Designation Title	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
LB24133	Bank (Or Templand) Railway Viaduct Over Lugar Water In Woodroad Park	0	4.9km	East	Due to this asset, and contemporary assets with intervisibility, falling outwith the ZTV, this asset has been scoped out of further assessment.

Table 6: Category B Listed Buildings within 10km of the Proposed Turbines

Designation Reference	Designation Title	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
LB956	Craigston Square Nos. 1-10	13	3.2	East	The asset comprises a series of one-storey miners' cottages, configured in an L-shape. The cottages were built for the workers associated with the Lugar iron works, which operated from the mid-1800s to the early 1900s. The asset is designated for its architectural interest, as well-preserved surviving cottages from this period, as well as its historic interest through its association with the mining history of Lugar. Whilst up to 13 turbine tips may be visible from the asset, external views do not contribute to the ability to understand, appreciate and experience the assets architectural and historical value. The asset's setting is purely functional, related to the proximity of the cottages to the mining infrastructure. As such, the Proposed Development would not impact the cultural significance of the asset. It is scoped out of further assessment.

LB957	Craigston House	13	3.3	East	The asset is an early 19th century house, within its own grounds, with preserved original features such as moulded cornicing, a pilastered doorway, and entablatures on scroll brackets. The asset is designated for its architectural value, as it is a well-preserved house from this period. Its setting is confined to its historic grounds, which are preserved today, with long distance or outwards views not contributing to its cultural significance. As such, any visibility of the proposed turbines would not impact the ability to understand, appreciate or experience the asset or its setting within its associated grounds. It is scoped out of further assessment.
LB965	Logan Bridge	13	3.7	East	The asset is a bridge, which crosses Lugar Water and connects the parishes of Old Cumnock to Auchinleck. The asset is designated due to its architectural interest, as a well-preserved single arch bridge, with raised pointed parapets and square stone terminals. The bridge's setting is functional, providing a mode of access between two banks of the river. Long-distance views, or views of the wider landscape, do not contribute to the asset's cultural significance. As such, the Proposed Development would not impact the ability to understand, appreciate and experience the asset and its significance. The asset is scoped out of further assessment.
LB967	Railway Viaduct, Rosebank.	5	2.3	East	The asset is a railway viaduct, opened in 1872, which carries a dismantled branch of the Glasgow and South Western Railway over the Glenmuir Water. The asset is designated for its architectural interest, as a well-preserved viaduct comprising 14 arches of 50ft and 30ft in height, as well as its historic value through its association to architect James Miller, who was well known for his railway architecture. The asset's setting is functional, carrying the railway over the watercourse. The architecture of the viaduct can be best appreciated from the low ground along the banks of the Glenmuir Water. Visibility of up to five turbine tips would not impact on the ability to understand, appreciate or experience its architectural and historic value, nor distract from its point of appreciation, given the prominence of the asset when travelling along the banks of the watercourse. The asset is therefore scoped out of further assessment.

LB968	Glenmuir Bridge	14	1.4	Northeast	The asset is a bridge, which crosses the Glenmuir Water, carrying the Glenmuir Water Road over the watercourse. The asset is designated for its architectural interest, as a well preserved single arched bridge from its period. The bridge's setting is functional, as a method for crossing between the two banks of the watercourse. As such, long-distance or wide-ranging views do not contribute to the asset's cultural significance. Whilst up to 14 turbine tips are anticipated to be visible from the asset, these tips would not impact the ability to understand, appreciate, and experience the asset, its architectural value or its functional setting. It is therefore scoped out of further assessment.
LB970	Covenanters' Monument, Airds Moss	13	2.3	South	The asset is a memorial, marking the spot where a group of Covenanters were shot. A gravestone for one of the men, Richard Cameron, is also at the same location. The asset is designated for its architectural and historic value, as a well-preserved memorial from the late 1600s, as well as its connection to the Covenanter movement. The asset's setting is confined to its location on the moorland, as this was the place where the men were caught and killed. Long distance and wide-ranging views of the surrounding landscape do not contribute to the asset's cultural significance. As such, whilst up to 13 turbine tips are anticipated to be visible from the asset, their presence would not impact the ability to understand, appreciate or experience the memorial and its architectural and historical interest.
LB14382	Greenockmains	13	3.6	South	The asset is a one story courtyard farm, with well-preserved walled forecourt, limewashed byres and a cream washed center dwelling. The asset is designated for its architectural value, as a well-preserved farmstead building from its period. The asset's setting comprises its immediate surrounding farmland, which the occupants have continuously farmed since its construction. Long-distance views of the surrounding landscape do not contribute to the asset's setting. As such, whilst up to 13 turbine tips are anticipated to be visible from the asset, their presence would not impact the ability to understand,

					appreciate and experience the asset's architectural value, nor its relationship to the immediate surrounding agricultural landscape. It is therefore scoped out of further assessment.
LB14383	Greenockmains Bridge	8	3.4	South	The asset is a single humped-back bridge which spans Greenock Water, designated for its architectural value as a well-preserved post-medieval road bridge. The asset's setting is functional, providing access to both banks of Greenock Water. Views of the surrounding landscape do not contribute to the asset's cultural significance. As such, whilst up to 8 turbine tips are anticipated to be visible from the asset, they would not be anticipated to impact the ability to understand, appreciate and experience the asset and its architectural interest, nor its functional role as a crossing over the Greenock Water.
LB14393	Cairn Near Townhead Of Greenock	2	3.3	South	The asset is a cairn, erected in 1914, to mark the place where John Lapraik lived. Lapraik was a friend of Robert Burns and a poet in his own right. The asset is designated for its historical value, through its association with this friend of Burns. The asset's setting comprises its location at the historic position of Lapraik's house. Views of the surrounding landscape do not contribute to its cultural significance. As such, whilst up to four turbine tips are anticipated to be visible from the asset, views of the turbine tips would not impact the ability to understand, appreciate and experience the asset and its historic interest. It is therefore scoped out of further assessment.

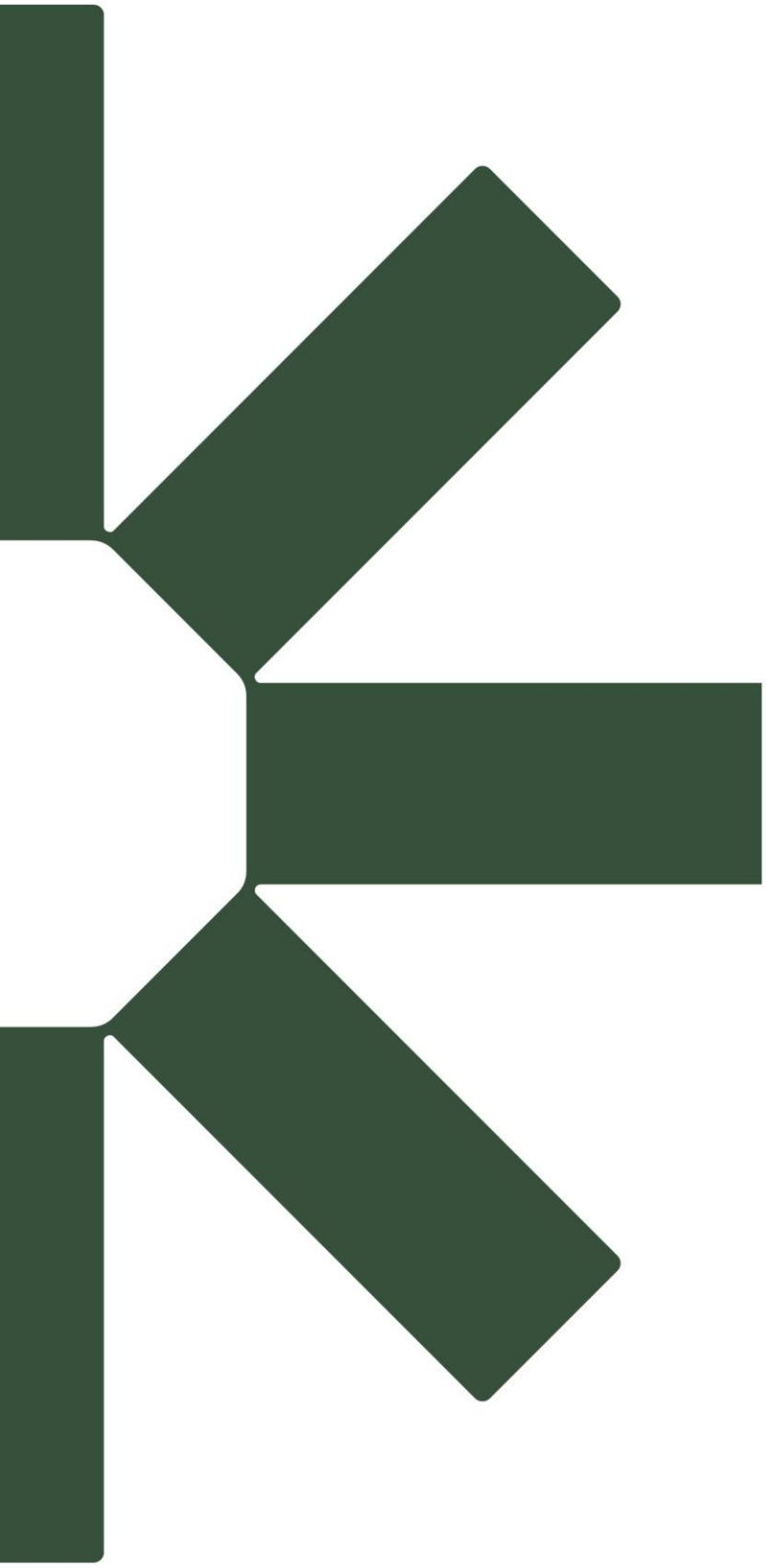
Table 7: Conservation Areas within 5km of the Proposed Turbines

Designation Reference	Designation Title	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
CA65	Lugar	0-14	2.3km	East	The asset comprises the Conservation Area of Lugar. Lugar is a small post-medieval mining/industrial village, mainly focused along the northern edge of the A70 (Muirkirk Road). The village was created in 1845 to

Designation Reference	Designation Title	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
					provide housing for the workers for Lugar Iron Works, as well as for the colliers and workers from the surrounding pits. The character of the village is thus derived from the preservation of these original miner's cottages and surviving buildings along Muirkirk Road and Craigston Square. The iron works are no longer in use, and the village has had some modern development and redevelopment in recent years, however, its character has been retained. The village is approached along the A70, which runs roughly southwest to northeast and from which the conservation area is best appreciated. Views of the surrounding landscape do not contribute to the character of the conservation area or its cultural significance. As such, whilst up to 14 turbine tips would be visible in parts of the conservation area, the ability to understand the industrial character of the village would not be impacted. It is scoped out of further assessment.

Table 8: Inventory Gardens and Designed Landscapes within 10km of the Proposed Turbines

Designation Reference	Designation Title	No. of Turbine Tips Visible (0-17)	Distance to the Nearest Turbine (km)	Direction to the nearest turbine	Appraisal Comments
GDL00149	**Dumfries House**	**0-14**	**6.1km**	**East**	**Scoped in for further assessment.**



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