



Clyde South Energy Park Limited

EIA Scoping Report

Renewco Power

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Table of Contents

1.0	Introduction	1
2.0	Proposed Development	5
3.0	Planning Policy Considerations	11
4.0	Landscape and Visual Assessment	12
5.0	Ecology	23
6.0	Ornithology	31
7.0	Cultural Heritage	41
8.0	Geology, Geohydrology, Hydrology & Peat	55
9.0	Transport and Access	69
10.0	Noise	73
11.0	Aviation	77
12.0	Forestry	81
13.0	Socioeconomics and Tourism	83
14.0	Telecommunications	88
15.0	Glint and Glare	90
16.0	Shadow Flicker	94
17.0	Air Quality & Human Health	95
18.0	Risk of Major Accidents and/or Disasters	96
19.0	Eskdalemuir Impact Assessment	97
20.0	Summary of EIA Scope	99
21.0	Scoping Consultees	100
22.0	References	102

Appendices

Appendix A	Cultural Heritage Appraisal
Appendix B	Eskdalemuir Impact Assessment



Acronyms and Abbreviations

Abbreviation	Definition
AGL	Above Ground Level
ARP	Aerodrome Reference Point
AWI	Ancient Woodland Inventory
BESS	Battery Energy Storage System
BGS	British Geological Survey
BRE	Building Research Establishment
CAP	Civil Aviation Authority Publication
CAR	Controlled Activities Regulations
CEMP	Construction Environmental Management Plan
CNS	Communications, Navigation and Surveillance
CoWRP	Control of Woodland Removal Policy
DECC	Department for Energy and Climate Change
DEMP	Decommissioning Environmental Management Plan
DGRSG	Dumfries and Galloway Raptor Study Group
DIO	Defence Infrastructure Organisation
DWPA	Drinking Water Protected Areas
EIA	Environmental Impact Assessment
EIA Regulations	The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
EIA Report	Environmental Impact Assessment Report
EKA	Eskdalemuir Impact Assessment
EWG	Eskdalemuir Working Group
G&G	Glint and Glare
GDL	Gardens and Designed Landscapes
GIS	Geographic Information System
GPP	Guidance for Pollution Prevention
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HER	Historic Environment Record
HES	Historic Environment Scotland
IEMA	Institute of Environmental Management & Assessment
IOFs	Important Ornithological Features
JRC	Joint Radio Company
LCT	Landscape Character Types
LVIA	Landscape and Visual Impact Assessment
MoD	Ministry of Defence



Abbreviation	Definition
NATS	National Air Traffic Services
NBN	National Biodiversity Network
NFI	National Forest Inventory
NHZ	Natural Heritage Zone
NPF4	National Planning Framework 4
NWSS	Native Woodland Inventory of Scotland
OBEMP	Outline Biodiversity Enhancement Management Plan
OEMP	Operational Environmental Management Plan
OS	Ordnance Survey
PAC	Pre-Application Consultation
PAN	Planning Advice Note
PLHRA	Peat Landslide Hazard Risk Assessment
PMP	Peat Management Plan
PSR	Primary Surveillance Radar
PV	Photovoltaic
PWS	Private Water Supply
RDC	Rural Developments Contracts
RSPB	Royal Society for the Protection of Birds
SEPA	Scottish Environment Protection Agency
SIL	Seismic Impact Limit
SLA	Special Landscape Area
SLC	South Lanarkshire Council
SLLDP2	South Lanarkshire Local Development Plan 2
SNH	Scottish Natural Heritage (now NatureScot)
SPP	Scottish Planning Policy
SSRSG	South Strathclyde Raptor Study Group
SUP	Southern Upland Partnership
TA	Transport Assessment
TMA	Terminal Manoeuvring Area
VP	Vantage Point
WEWS	Water Environment and Water Services (Scotland) Act
WoSAS	West of Scotland Archaeology Service
ZTV	Zone of Theoretical Visibility



1.0 Introduction

1.1 Background and Context

Clyde South Energy Park Limited (hereafter referred to as “the Applicant”) intends to apply to the Scottish Ministers for consent under Section 36 of the Electricity Act 1989 (the ‘Electricity Act’) to construct and operate Clyde South Energy Park (hereafter referred to as the “Proposed Development”) at site centre British National Grid (BNG) 286646 829834. The application will be supported by an Environmental Impact Assessment Report (EIA Report) as required by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (the EIA Regulations). This document forms the EIA Scoping Report submitted to the Energy Consents Unit in order to request an EIA Scoping Opinion, on the context of Environmental Impact Assessment (EIA) of the Proposed Development.

The Proposed Development will comprise nine wind turbines, each up to 180 m blade tip height, as well as solar photovoltaic (PV) arrays and an associated on-site battery energy storage system (BESS). At this stage the total generating capacity of the wind turbines is anticipated to be in the region of 63 MW, with an additional solar PV capacity of approximately 45 MW and 50 MW of energy storage, resulting in a total capacity of approximately 158 MW. The associated infrastructure will include site access, turbine hardstandings and laydown areas, underground cabling, an on-site substation, transformers, temporary construction compound, and potential excavations/borrow workings.

1.2 The Applicant

Clyde South Energy Park Limited is wholly owned by Renewco Power Limited. Renewco Power Ltd is a UK-headquartered renewable energy developer dedicated to developing onshore wind, solar PV, battery storage and green hydrogen projects across the UK, Spain and Italy. With over 40 employees, Renewco is committed to driving the transition to clean energy and on track to deliver 5GW of ready-to-build projects by 2029, while continuing to build upon its 8GW project pipeline across Renewco’s core markets.

Renewco’s founding team brings over 250 years of combined renewables expertise, having successfully developed more than 10GW of renewable energy across 50+ countries. This track record includes raising over £2 billion in project financing and building multiple successful companies that deliver both community benefits and strong investor returns.

Renewco have experience of submitting highly detailed planning applications for hybrid projects within Scotland, particularly within the M74 corridor. Recent applications include the M74 West Renewable Energy Park, comprising approximately 295 MW capacity of a combination of wind turbines, solar PV and BESS technologies. The Applicant is committed to developing 1 GW of onshore wind by 2027, with Scotland targeted as a region with significant potential to deliver onshore wind developments in line with Scottish Government renewable energy targets.

1.3 The Purpose of the Scoping Report

The purpose of this EIA Scoping Report is to request a Scoping Opinion as per Regulation 12 (1) of the EIA Regulations setting out the information that ought to be provided by the EIA and included in the EIA Report. The Scoping Opinion is to be adopted following discussion with the consultation bodies.



The Applicant recognises the value of the scoping approach and the purpose of this report is to ensure that relevant issues are identified and to confirm that the assessment process described will meet legislative requirements.

This EIA Scoping Report:

- Describes the existing site and its context;
- Identifies key organisations to be consulted in the EIA process;
- Establishes the format of the EIA Report;
- Provides baseline information; and
- Describes potential significant effects and the proposed assessment methodologies for various technical assessments to be covered in the EIA Report.

This Scoping Report has taken due cognisance of the recently published Guidelines on Streamlining Environmental Impact Assessment for Onshore Wind Farms (Scottish Renewables, 2025).

1.4 Environmental Impact Assessment

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 Applicant that the Proposed Development qualifies as “EIA Development” and therefore the Applicant will voluntarily submit an EIA Report, as part of the application for consent under Section 36 of the Electricity Act and has not requested an EIA Screening Opinion.

EIA is an iterative process, which identifies the potential environmental effects that in turn inform the eventual design of the proposals. It seeks to avoid, reduce, offset and minimise any adverse environmental effects through mitigation. It considers the effects arising during the construction, operation and decommissioning phases. Consultation is an important part of the EIA process and assists in the identification of potential effects and mitigation measures.

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

- Volume 1 – Written Statement
- Volume 2 – Figures
- Volume 3 – Visualisations
- Volume 4 – Technical Appendices
- Volume 5 – Confidential Appendices (if required)

A Non-Technical Summary (NTS) will also be provided.

Chapters 1 to 4 of Volume 1 will comprise:



- An introduction;
- A description of the Proposed Development;
- A description of the site selection and design iteration process; and
- Information on the approach to EIA and determination of significance of effects.

The remainder of Volume 1 will present an assessment of a range of environmental topics. Based on the available baseline environment information and the details of the Proposed Development, the environmental topics have been scoped on the basis of the potential for significant environmental effects. This has determined the need to undertake impact assessment to investigate each potential effect. Each of the 'scoped-in' topics will be reported as a chapter of Volume 1. Technical reports, including reports for topics that have been 'scoped-out' of the EIA process, which will be provided as appendices.

Potential effects will be assessed based on the sensitivity of identified receptors, and the magnitude of potential impacts arising from the construction, operation and decommissioning of the Proposed Development. Clear criteria for the determination of receptor sensitivity and impact magnitude will be set out in the EIA Report, together with criteria for determining the resultant significance of effect.

The EIA Report will also include a schedule of mitigation measures and a summary of residual effects.

A standalone Planning Statement will be provided, assessing the Proposed Development against all relevant planning and energy policy.

1.5 Consultation

The Applicant considers consultation with the community to be an important part of the development design process and will engage with the local community throughout the application process. As this is a Section 36 application, there is no formal requirement to follow the pre-application consultation procedures for major developments under the Town and Country Planning (Scotland) Act 1997, as amended, however this application will follow the processes and standards set by the legislation and best practice guidelines (e.g. Planning Advice Note (PAN) 3/2010 - Community Engagement). Additionally, the Scottish Government has consulted on proposed reforms to the consenting process under the Electricity Act 1989 whereby the reforms aim to make public consultation a formal requirement. Therefore, it is expected that a Pre-Application Consultation (PAC) Report will be submitted with the application.

In line with best practice, two rounds of public consultation will be performed to allow members of the local community to be informed of the project and provide their views. Consultation events will also allow communities close to the Proposed Development to feed into the iterative design process to help inform the Proposed Development's design layout.

Liaison with key stakeholders and local communities will be sought at appropriate milestones throughout the EIA process. It is anticipated that the liaison strategy will embrace a range of methods of communication and feedback that may include online feedback, face to face meetings, newsletters and press releases.

The Applicant considers consultation with statutory and non-statutory consultees to be an integral part of the iterative EIA process and recognises the benefits in carrying out early consultation with all relevant parties. The consultation will progress with the circulation of this



Scoping Report and will continue for the duration of the EIA process. A list of the consultees this Scoping Report is expected to be circulated to is provided in **Section 21.0**.

1.6 Consideration of Alternatives

The EIA Regulations require the reporting of the consideration of alternatives and an indication of the reasons for selecting the site, except, as noted in PAN 1/2013, where limited by constraints of commercial confidentiality.

Through a desktop environmental feasibility assessment, the Applicant identified the Proposed Development Site as being suitable for wind energy development along with co-located technology including solar and BESS. The Site is located adjacent to operational windfarms within the M74 corridor, demonstrating the Site to be a viable and productive site for wind energy generation. Additionally, existing local infrastructure for grid connection and electricity export, as well as a major road network for transportation, further indicate the suitability of the Proposed Development Site for co-located renewable energy development.



2.0 Proposed Development

2.1 Site Description

The Site is located 11 km north-west of Moffat and 1 km south-east of Elvanfoot within the South Lanarkshire Council (SLC) area (see **Figure 2.1**). The Site is located directly to the south of the A74 (M) and the West Coast Main Line railway within the M74 corridor, within the Lowther Hills. The approximate site centre is located at British National Grid (BNG) reference NS 97119 12428.

The Site is approximately 1,059 hectares (ha) and comprises upland moor, pastoral agricultural land, river floodplain and small areas of commercial forestry. The Site lies between 270 meters (m) above Ordnance Datum (AOD) at the lowest point in the north-west of the Site adjacent to the West Coast mainline railway track, and 560 m in the south-east close to the summit of Hods Hill. The topography of the site is significantly undulating with multiple minor hills including Brown Hill (383 m AOD), White Hill (376 m AOD), Lion Hill (400 m AOD) and Hods Hill (567 m AOD) running north to south through the Site.

Access points to the Site are currently under review and the expectation is that construction traffic, including deliveries of abnormal indivisible loads (AILs), will be routed from the port of delivery onto the A74(M) and the A702 immediately to the west of the Site.

The River Clyde flows northwards within the western boundary of the Site before exiting to the west of Crookedstane farm. The River Clyde is fed by numerous watercourse tributaries flowing west downhill off the Lowther hills. These include the Clydes Burn, Crookedstane Burn, Blakehouse Burn, Nunnerie Burn, Allershaw Burn, Wintercleuch Burn and Hapturnell Burn running from north to south. Immediately adjacent to the south-west of the Site is Daer Reservoir and Hydro power scheme, with the Daer Water flowing into the River Clyde prior to its entry into the Site.

The Site contains approximately 16 ha of commercial forestry, centred at BNG reference NS 96716 12907, as well as small areas of natural woodland to the south of Nunnerie farm and Crookedstane farm respectively.

Three residential properties are located within the Site with two located at Crookedstane farm in the north and one at Nunnerie farm in the west. The nearest settlement to the Site is Elvanfoot, located approximately 1 km north-west of the Site and comprising ~20 residential properties. Further residential properties are located to the south along the Daer valley, and west along the A702.

2.2 Proposed Development Description

The Proposed Development will consist of nine stand-alone, three-bladed horizontal axis wind turbines as well as up to 50 ha of solar PV arrays and an associated on-site battery energy storage system (BESS). An indicative turbine layout is provided in **Figure 2.2**.

2.2.1 Wind Turbines, Foundations, Transformers and Crane Pads

The specification of a typical wind turbine would comprise a horizontal axis design, of three rotor blades, a hub and a nacelle. The tower would be tubular and tapered in design and finished in a light grey semi-matt colour. All turbines are anticipated to have a maximum blade tip height of 180 m. Based on currently available turbine models these are likely to have a rotor diameter of approximately 162 m and a hub height of approximately 99 m, each with a



typical generating capacity of approximately 7 MW. Indicative turbine locations are noted in **Error! Reference source not found.** below.

Table 2.1 - Proposed Indicative Turbine Co-ordinates (BNG)

Turbine Number	X Co-ordinate	Y Co-ordinate
1	297267	615081
2	296929	614381
3	296292	613917
4	297090	611633
5	296591	611026
6	297336	611307
7	297236	610578
8	297750	611037
9	298041	610656

A single representative candidate turbine manufacturer and model will be selected and assessed for each technical and environmental discipline, as necessary, during the EIA. A competitive procurement process will be undertaken, should consent be forthcoming and prior to construction, to select the final turbine that would be installed on Site. The final wind turbine selected would have dimensions that fit within the maximum parameters assessed in the EIA, i.e. up to 180 m height to tip.

The turbines will be fixed to reinforced concrete foundations, formed in excavations approximately 3.5 m deep, depending upon ground conditions. Detailed design specifications for each foundation will depend on site-specific ground conditions to be determined during pre-construction ground investigations, as well as the specific turbine model selected, and various other engineering considerations.

Crane pads would be left in-situ following erection of turbines, to allow for maintenance and replacement of parts as necessary during the lifetime of the Proposed Development. Elements of the crane pad and other laydown area may be removed following construction, depending on the detailed requirements of the final turbine model selected.

2.2.2 Solar Arrays

Suitable areas of the Site may be used to locate ground mounted solar photovoltaic technology (solar PV arrays). The solar array will cover an area of approximately 50 ha, with potential locations being considered in the east, central and southern parts of the Site.

The ground-mounted solar PV panels will be supported by a light frame which will be installed into the ground to provide stability to the panels. The modules will be arranged in rows and stand approximately 0.6 - 0.8 m Above Ground Level (AGL) at their minimum point and a maximum height of up to 3.5 m AGL. The panels will be electrically connected with low voltage cabling which will feed into central inverters and transformers before further underground cabling transports the electricity to the control building.

Inverters and field transformer units will be installed within the solar PV area, in order to convert the Direct Current (DC) produced by the PV modules, into an Alternating Current (AC)



which is compatible with the local electricity distribution network. These units are typically small structures, approximately 6 m by 2.5 m in plan and 3 m high. They would be sited adjacent to access tracks, each on a concrete plinth.

Suitable areas will be determined by environmental and technical constraints and will be subject to a similar iterative design evolution process as other aspects of the Proposed Development.

2.2.3 Battery Energy Storage System

A BESS facility is proposed at the Site to support the flexible operation of the National Grid and decarbonisation of electricity supply. A BESS compound is proposed within the Site to be collocated with the onsite substation. The final location will be subject to further study and iteration, including optimisation modelling and environmental assessment work, during the EIA stage.

The BESS facility would store electrical energy through the use of batteries, contained alongside inverters, adjacent to the on-site substation to allow easy connection to the grid. The batteries would be housed in structures very similar to shipping containers. The BESS facility would include the following elements: battery storage containers, switchgear, inverters, Supervisory Control and Data Acquisition (SCADA) equipment and a fire suppression system.

2.2.4 Access to Site

The exact locations for the proposed site access junction (including for construction and AIL traffic) have yet to be finalised.

2.2.5 Site Access Tracks

As a new wind farm development, the Proposed Development will include new access tracks connecting the site entrance to the turbine locations and other site infrastructure. The track layout will be designed to minimise potential impacts on the environment (e.g. ecological and hydrological receptors), while taking account of other site-specific constraints such as topography. The EIA Report will include a rationale for the final track layout.

The number of new watercourse crossings will be minimised as far as practicable and where these cannot be avoided, they will be designed to minimise environmental impacts.

2.2.6 Associated Infrastructure

In addition to the turbines, BESS, solar arrays, access tracks and borrow pits, associated works will be required for the following:

- Underground electrical cabling;
- A substation compound;
- Communication mast(s);
- Permanent control building;
- Security fencing and Closed Circuit Television (CCTV);
- Watercourse crossings;
- Flood risk measures (if required);
- Borrow pits;



- One or more temporary construction compounds; and
- Health & safety and other directional site signage.

Biodiversity will be preserved, restored and enhanced through the Proposed Development layout and design process using the understanding of the Site's context locally, regionally and nationally. This will be managed and monitored through Biodiversity Enhancement Management Plans, an outline version of which will be provided as a Technical Appendix to the EIA Report and form part of the application for consent.

The parameters for the Proposed Development, which will form the basis of what is considered in the EIA Report, will be such that an appropriate level of assessment is undertaken for a given hub height and rotor diameter, within the envelope of a maximum tip height. The indicative turbine and solar PV locations will evolve in response to the ongoing detailed assessment work, taking consideration of factors such as the potential for environmental effects, terrain, current land use, technical and health and safety issues. The parameters of the Proposed Development will be explicitly identified in the EIA Report. The final locations of the proposed infrastructure will be 'frozen' at an appropriate time in order to enable the EIA Report to describe fully the Proposed Development for which Section 36 consent and deemed planning permission is sought.

Whilst the location of the infrastructure will be determined through an iterative environmental information-based design process, there is the potential for these exact locations to be further optimised through micro-siting allowances prior to construction.

The Applicant proposes a micro-siting allowance of up to 100 m in all directions within the Site boundary in respect of each turbine, BESS, solar PV array and the associated infrastructure in order to address any potential difficulties which may arise in the event that pre-construction surveys identify unsuitable ground conditions or environmental constraints that could be avoided.

Based on the preliminary, indicative layout being considered, the Proposed Development would provide a total generating capacity from wind turbines of approximately 63 MW (based on 9 turbines each with a 7 MW rated capacity) and an approximate additional 45 MW of solar PV generating capacity.

Based on community benefit contribution of £5,000 per MW per annum for wind turbines and £400 per annum per MW installed capacity of solar PV, the Proposed Development could generate up to £333,000 per annum (approximately £13.3 million over its operational life) to support local groups and projects in the settlements closest to the Site.

2.3 Future Baseline Conditions

Clyde Wind Farm is a 206 turbine operational wind farm development located adjacent to the north and east of the Proposed Development's Site. Clyde Wind Farm is comprised of two main phases; the original development including 152 turbines began construction in 2009, while an extension of 54 turbines became operational in 2017. The development is widely distributed throughout the M74 corridor, both to the north and south of the M74 carriageway in proximity to the villages of Crawford, Elvanfoot and Watermeetings. The first phase of Clyde Wind Farm will reach the end of its 28-year consent for operation in 2037. It is assumed that the first phase of Clyde Wind Farm will therefore be fully decommissioned by 2037, with no life-extension or wind farm repowering application currently within the planning system or public domain.



As such, it is the Applicant's intention to align construction and operation of the Proposed Development with the decommissioning of the first phase of Clyde Wind Farm. It is proposed that construction of the Proposed Development will occur concurrently with decommissioning works for Phase 1 of Clyde Wind Farm, such that the Proposed Development becomes operational shortly after the final decommission of Clyde Wind Farm's first phase. There will be no overlap of operation between the Proposed Development and the portion of Phase 1 of Clyde Wind Farm adjacent to the site.

This approach assumes that no life-extension or repowering application is submitted for Phase 1 of Clyde Wind Farm prior to the submission of the Section 36 planning application to Scottish Ministers for the Proposed Development.

In summary, it is assumed that the construction of the Proposed Development will occur at the same time as the first phase of Clyde Wind Farm is being decommissioned and that the 'future baseline' conditions for the EIA will therefore include the removal of the first phase of Clyde Wind Farm, specifically the portion of Clyde Wind Farm located directly adjacent to the Proposed Development.

2.4 Construction Works

It is expected that the construction of the Proposed Development will be completed over a period of up to 24 months. This is an approximate timescale at this stage.

Construction will consist of the following principal activities:

- Construction of the temporary construction compound(s);
- Extraction of stone from borrow pits for track and foundation construction;
- Construction of site access junction, tracks and passing places and any watercourse crossings;
- Construction of culverts under tracks to facilitate drainage and maintain existing hydrology;
- Construction of all foundations and transformer plinths;
- Construction of an onsite substation and battery storage facility;
- Installation of photovoltaic solar panels
- Excavation of trenches and cable laying adjacent to site tracks;
- Movement onto site and erection of wind turbines;
- Commissioning of the Site;
- Restoration of borrow pits and temporary construction compounds; and
- Habitat enhancement and peatland restoration.

Many of these operations will be carried out concurrently, although predominantly in the order identified. This will reduce the overall length of the construction programme. In addition, tasks will be organised such that, at different parts of the Site, the civil engineering works will be continuing whilst generating technology is installed. Site restoration will be programmed and carried out to allow restoration of disturbed areas progressively and as early as possible.



2.5 Proposed Development Life and Decommissioning

Consent will be sought for an operational life of at least 40 years from the date of commissioning, after which it would be appropriately decommissioned. If, after the operational lifespan of the Proposed Development has expired there is potential for repowering, this would be subject to a new and separate application. The assessment reported within the EIA Report will assume that the Proposed Development will be decommissioned.

2.6 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, consented and in planning. The cumulative assessment will also consider the cumulative effects of different elements of the Proposed Development on the environment and sensitive receptors, and in particular the cumulative effects of different effects upon individual and groups of receptors.

There are a number of operational and wind farm developments in planning within 15 km of the Proposed Development. Wind farm developments of relevance will be considered in the cumulative assessment, with the main neighbouring projects shown in **Figure 4.3**. The methodology to be adopted for assessing the cumulative effects of wind energy developments will be in accordance with the Scottish Natural Heritage (SNH, 2012) Guidance '*Assessing Cumulative Impacts of Onshore Wind Energy Developments*'. The scope of the cumulative assessment will be agreed through consultation with South Lanarkshire Council and NatureScot.

Other operational and consented wind farms as well as those at the application stage, within 35 km of the Proposed Development, are illustrated and listed on **Figure 4.3** (see **Section Error! Reference source not found.**, Landscape and Visual, below).

It should be noted that this record will be updated throughout the EIA process, up to an agreed point prior to submission of the application. The Applicant welcomes any further information from stakeholders on additional proposed wind farm developments that should be considered. If any relevant cumulative solar PV or BESS developments are identified, these would be included within the cumulative assessment.



3.0 Planning Policy Considerations

The Proposed Development relates to electricity generation from renewable energy sources and is a direct response to national planning and energy policy objectives.

The Proposed Development would make a significant contribution to the attainment of renewable energy generation and greenhouse gas reduction targets at both the Scottish and UK levels and the quantification of this contribution will be described in the EIA Report.

The EIA Report will set out the relevant policies that have been considered as part of the assessments undertaken throughout the EIA. A separate Planning Statement will provide a detailed appraisal of the Proposed Development against the relevant Development Plan policies, national planning and energy policy and other material considerations.



4.0 Landscape and Visual Assessment

4.1 Introduction

This Section of the Scoping Report provides an overview of the potential effects of the Proposed Development on landscape and visual amenity. The Section sets out the approach to the Landscape and Visual Impact Assessment (LVIA) as part of the EIA Report including consultation, methodology, assessment of cumulative effects and the evaluation of the potential significant effects.

The LVIA Chapter of the EIA Report will be undertaken by Chartered Members of the Landscape Institute (CMLI) from Marc Van Grieken Landscape Architects and based on professional experience and judgement.

This Section of the Scoping Report is supported by the following figures:

- **Figure 4.1:** 45 km Zone of Theoretical Visibility;
- **Figure 4.2:** 45 km Zone of Theoretical Visibility at A1 Size;
- **Figure 4.3:** Existing and Cumulative Wind Farms.
- **Figure 4.4:** Landscape Character Types;
- **Figure 4.5:** ZTV and Proposed Viewpoints; and
- **Figure 4.6:** Designated Landscapes

4.2 Baseline Description

The Study Area to be adopted for the LVIA Chapter, in accordance with NatureScot guidance, suggests that for turbines of over 150 m to blade tip, an initial study area of 45 km radius should be considered, followed by refinement to focus on potential significant effects.

Subsequently, basic Zone of Theoretical Visibility (ZTV) mapping was prepared from the outer turbines allowing some early analysis of the potential geographic range of potential landscape and visual effects. The ZTV (see **Figures 4.1** and **4.2**) show areas from where any part (however small) of the proposed turbines would theoretically be visible. It does not take account of any screening or indicate how much of any turbine may be seen, i.e. whether visibility at any given point is of blade tips only or full turbines. This type of ZTV therefore represents the maximum theoretical visibility of the Proposed Development.

The ZTV shows that theoretical visibility would be widespread within 5 km from the Site, thereafter, would reduce to high ground on the eastern side of the M74/A74 road corridor to the north and east, and along the A702 road corridor to the south. Thereafter, theoretical visibility would be limited to the summits and upper slopes of the Southern Uplands surrounding the Site.

Following a review of the ZTV and fieldwork, the Study Area was reduced to allow reporting to focus on the extent of likely significant effects. Visual effects were considered for locations across the wider area, but those reported on in detail are within an area of approximately 25 km radius from the outermost turbines for viewpoints and routes, and approximately 10 km radius for settlements. Effects on landscape character and designated landscapes were also considered for a wider area, and the report focuses on those within approximately 15 km radius where significant effects were found to be more likely.



There is extensive wind energy development within this part of Scotland (see **Figure 4.3**). Key considerations will be the interaction of the Proposed Development with existing wind farms, and those that are consented and currently within the planning system. It is unlikely that significant cumulative effects due to the introduction of the Proposed Development would be identified at a range greater than 15 km, and it is proposed therefore that the Cumulative Landscape and Visual Impact Assessment (CLVIA) will focus on receptors within 15 km of the outermost turbines. Data collection of operational and cumulative sites will focus on schemes within approximately 25 km from the Proposed Development (to allow for views in opposite directions).

Following identification of the Study Area, a preliminary review of the baseline conditions has been undertaken, and the findings are reported below.

The key sources of information to inform the baseline landscape and visual conditions of the Site and its surroundings are:

- Ordnance Survey and other leisure maps.
- Scottish Landscape Character Types Map and Descriptions (NatureScot, 2019);
- Landscape Character Assessment: Glasgow and Clyde Valley – Landscape Evolution and Influences (NatureScot, 2019);
- South Lanarkshire Assessment (SLC, 2010); and
- Citations for designated landscapes available from NatureScot, Historic Environment Scotland (HES), SLC, Scottish Borders Council (SBC), and Dumfries and Galloway Council (DGC).

The Site

The Site is located to the west and south of Clyde Wind Farm and on the eastern side of the valley containing the Potrail Water, River Clyde and A702 road in South Lanarkshire. Predominantly upland moorland in character, the Site is undulating and includes a series of rounded hills characteristic of the Southern Uplands including Brown Hill (383 m Above Ordnance Datum (AOD) and Lion Hill (400 m AOD).

The southern boundary is bounded by the Southern Upland Way long distance footpath.

The Surrounding Landscape

The 45 km initial Study area runs from Leven Seat (356 m AOD) in the north, Chisholme in the east, New Abbey in the south, and extends to Dalmellington in the west.

The ZTV however, illustrates that theoretical visibility of the Proposed Development would not cover all this area, and as discussed above, the assessment will focus on a smaller Study Area where significant landscape and visual effects may occur. The study area, of approximately 15 km radius as identified above, encompasses the Southern Uplands to the east and south, and the Lowther Hills in the north and west.

There are numerous existing wind farms within 25 km of the Site, as shown on **Figure 4.3**, including large developments such as Clyde and its extension that spread across a wide area to the north-east and east of the Site. Harestanes and Minnygap occupy an area to the south-east of the Site and Dalswinton further south. To the north-west, Andershaw and Middlemuir are located south of Douglas and beyond the Southern Uplands.



Consideration of the relationship between the Proposed Development and these wind farms will be a key aspect for both design of the scheme and assessment of landscape and visual effects.

The Landscape Character Types (LCTs) within the Site and Study Area are described in the 2019 NatureScot review of the landscape character of Scotland and illustrated on **Figure 4.4**.

The Site lies partially within the Upland Glen – Glasgow & Clyde Valley (LCT 209), and Southern Uplands – Glasgow & Clyde Valley (LCT 217).

The LCTs to be included within the LVIA are as follows:

- LCTs hosting the turbine array:
 - Upland Glen – Glasgow & Clyde Valley (LCT 209); and
 - Southern Uplands – Glasgow & Clyde Valley (LCT 217).
- Other nearby LCTs with more than limited theoretical visibility that will be considered in the LVIA include:
 - Southern Uplands – Borders (LCT 95);
 - Foothills with Forest – Dumfries & Galloway (LCT 176); and
 - Southern Uplands – Dumfries & Galloway (LCT 177).

Visual Amenity

Effects on views and visual amenity occur when the Proposed Development changes or influences the view or visual amenity as experienced by people. Visual amenity may be described as the overall visual experience from a given location, whilst a 'view' reflects a specific direction. People may invariably be engaged in different activities or have different perspectives and in recognition of these differences, it is common practice to refer to 'visual receptors' and these include:

- residents within settlements and of individual properties.
- people who travel through the area with potential views of the Proposed Development; and
- people engaged in recreational activities including walkers on hills, core paths and visitors to tourist destinations where the visual experience is likely to include a focus on the surrounding landscape.

Visual Receptors

The ZTV shown in **Figures 4.1** and **4.2** indicates theoretical visibility at several settlements within the wider 45 km Study Area. The LVIA will concentrate on the effect on views from settlements within 15 km of the outermost turbines, where there is potential for significant effects to occur.

Residential properties within approximately 2.5 km of the outermost turbines include properties along the A702 road, and the minor road leading to Daer Reservoir.

Roads within the Study Area tend to follow valleys or passes, although a network of roads cover flatter land. The main routes from which theoretical visibility is identified include:

- M74/A74(M) motorway from Glasgow to Carlisle passes the northern boundary of the Site; and



- A702 trunk road from Biggar to Carronbridge – passes the western boundary of the Site;

The West Coast Main Line rail route between Glasgow and London passes through the Clyde valley between Symington to Abington and Crawford before passing over the Beattock summit towards Moffat, passes the northern boundary of the Site for approximately 1.6 km. The ZTV indicates theoretical visibility of the Proposed Development from the railway directly to the north of the Site.

Recreational routes tend not to be limited to valleys, with the Southern Upland Way long distance path crossing the hills and passing the southern boundary of the Site. National Cycle Route 74 (NCN74) from Gretna to Glasgow runs parallel to the M74/A74(M) north of the Site. The LVIA will also consider views from Core Paths within 5 km and Scottish Hill Tracks where relevant.

Proposed Viewpoints

Viewpoints proposed for the assessment of visual effects would be discussed with SLC and NatureScot, with an initial list of locations identified in Table 4.1 below (shown on **Figure 4.5**). These include locations to represent:

- views from the local roads including those listed above;
- views from settlements close to the Proposed Development;
- views from key visitor locations within the surrounding landscape e.g. from the Southern Upland Way; and
- views from hilltops that are both popular with walkers and representative of designated landscapes, such as Tinto Hill, Lowther Hill and Queensberry.

Table 4.1: Preliminary Viewpoints

Viewpoint	Location	Coordinates		Approx. Distance (km)	Receptor Represented
1	Tinto	295324	634367	19.4	Walkers
2	Broad Law	314629	623556	19.3	Walkers
3	Culter Fell	305280	629061	16.1	Walkers
4	A702 road	295865	615648	1.5	Road users
5	Watermeetings	295049	613262	1.4	Residents / Road users
6	Daer Reservoir	297937	609149	1.5	Walkers
7	Hart Fell	311344	613574	13.6	Walkers
8	Lowther Hill	288987	610403	7.6	Walkers
9	Comb Head	290505	609196	6.4	Walkers
10	Wintercleuch	296572	610020	0.9	Residents / Road users



Viewpoint	Location	Coordinates		Approx. Distance (km)	Receptor Represented
11	Hods Hill – Southern Upland Way	300477	609480	2.7	Walkers
12	A74(M)	295912	617038	2.4	Road users

Landscape Designations

The Site is located partially within South Lanarkshire's Leadhills and Lowther Hills Special Landscape Area (SLA).

Landscape designations within the 15 km Study Area to be considered are illustrated on **Figure 4.6** and set out below:

- Drumlanrig Garden and Designed Landscape (GDL) – 12 km to the south-west;
- Talla Hart Fell Wild Land Area (WLA) – 8 km to the east;
- Upper Clyde Valley SLA – 10.3 km to the north-east;
- Douglas Valley SLA – 14.6 km to the north-west;
- Moffat Regional Scenic Area (RSA) – 5.1 km to the east;
- Tweedsmuir Uplands SLA – 5.7 km to the north-east; and
- Thornhill Uplands RSA – 4.9 km to the west and south.

4.3 Embedded Mitigation

Mitigation of landscape and visual effects will be undertaken through design modifications and input to the design process and documented in the EIA Report.

4.4 Assessment Methodology

4.4.1 Consultation

Due to the availability of information and existing knowledge of the area within the MVGLA consultancy team, no consultation on landscape and visual matters has been undertaken with SLC or with NatureScot prior to submission of this Scoping Report.

As part of the on-going work to inform the LVIA Chapter of the EIA Report, it is envisaged that a consultation exercise to obtain additional data and the views of statutory consultees will be undertaken necessary following receipt of the Scoping Opinion. Consultation correspondence on landscape and visual matters will be included in the LVIA chapter.

4.4.2 Assessment

The most widely visible elements of the Proposed Development will be the wind turbines. Much of the LVIA will therefore, necessarily, consider primarily the visibility and effects of the turbines. However, the assessment of effects will consider all other elements of the Proposed Development throughout.



The landscape and visual assessment will identify potential significant effects of the Proposed Development on the landscape resource and visual amenity, in accordance with the principles set out in GLVIA3.

4.4.3 Desk & Field Studies

Desk studies will be carried out to identify key landscape and visual receptors (in addition to the reviews set out above), and to identify the likely visibility of the Proposed Development based on ZTV mapping. Computer generated 3D models will be used to prepare draft wireline images to illustrate theoretical visibility, and to enable the confirmation and analysis of viewpoints for fieldwork and for detailed visualisation modelling through the production of wirelines and photomontages.

Fieldwork will be carried out including a visit to the Site, all viewpoints, and the wider area more generally to assess potential effects on landscape character and designated landscapes.

Photography will be undertaken for viewpoint locations, including photography at dusk for locations for which night-time photomontages are required to illustrate the effects of aviation lighting. Viewpoint locations will be agreed with statutory consultees including those illustrating potential night-time effects once the lit turbines have been identified.

4.4.4 Assessment of Landscape Effects

Effects on landscape character will be considered in detail for LCTs within the Study Area, with ZTV mapping used as a means of identifying which LCTs require assessment. Predicted changes in both the physical landscape and landscape character will be identified.

The assessment will identify the magnitude and type of change to the landscape, with reference to its key characteristics as set out in the NatureScot LCT descriptions. The sensitivity of the landscape will also be taken into account, acknowledging local sensitivity studies, and value placed on the landscape through designation, key or unique characteristics, as well as the presence of other consented and operational wind farms. The magnitude of the effect will be assessed in terms of the size and scale, geographical extent, duration and reversibility of the effect. These aspects will all be considered, to form a judgement regarding the overall effect and whether this is judged to be significant.

Significance of landscape effects, considering receptor sensitivity and the magnitude of change as set out above, will identify the level of effect using four categories: Major, Moderate, Minor, and Negligible. Major and Moderate effects would be considered to be significant in the context of the EIA Regulations.

4.4.5 Assessment of Visual Effects

Visual effects are experienced by people at different locations around the Study Area, at static locations (for example from settlements or from selected viewpoints) and sequentially when travelling along routes. It is usually considered that grouping people related to 'status' (e.g. residents, visitors/ tourists/ motorist) or the 'activity' they are engaged in (sport, informal recreation, commuting) will help the assessment of sensitivity and lead to findings which can be considered representative. Assessment of the visual effects of the Proposed Development on receptors will be based on analysis of the ZTVs, field studies and assessment of representative viewpoints. Proposed viewpoints have been listed in **Table 4.1** above. Some more distant key views may be provided with wirelines to illustrate potential visibility, even if no significant effects are likely to occur.



GLVIA3 states that the nature of visual receptors, commonly referred to as their 'sensitivity', should be assessed in terms of the susceptibility of the receptor to change in views/ visual amenity and the value attached to particular views. The magnitude of the effect will be assessed in terms of the size and scale, geographical extent, duration and reversibility of the effect. These aspects will all be considered in forming a judgement regarding the overall effect and whether this is judged to be significant.

Significance of visual effects, considering receptor sensitivity and the magnitude of change as set out above, will identify the level of effect using four categories: Major, Moderate, Minor, and Negligible. Major and Moderate effects would be considered to be significant in the context of the EIA Regulations.

4.4.6 Assessment of Aviation Lights

In the interests of aviation safety, CAA guidance states that turbines over 150 m to tip height are required to incorporate visible lighting. An assessment of the visual effects of aviation lighting on the proposed wind turbines will be carried out as part of the LVIA and included within the assessment.

The night-time context at viewpoint locations will be described, with the related sensitivity and magnitude of change arising from the proposed aviation lighting drawn upon to assess the likely visual effects of aviation lighting and to provide general comment on the likely effects across the wider Study Area.

Night-time photomontages, using photographs taken shortly after dusk (with due consideration of safety of photographers), will be produced for two to three viewpoints to illustrate the potential appearance of aviation lights on turbines relative to the existing night-time baseline. The selection of viewpoints to be represented will be agreed with consultees on completion of a design freeze and upon agreement of the scope of aviation lighting, but based on the scoping layout the following are suggested:

- VP4: A702 road;
- VP5: Watermeetings; and
- VP10: Wintercleuch.

It is not proposed to provide night-time visualisations from hills or remote off-road locations for Health and Safety reasons, and because there are less likely to be viewers in these locations after dark.

4.4.7 Residential Visual Amenity

Visual amenity is a component of 'residential amenity', which includes noise, shadow flicker etc, and is strictly a planning consideration relevant to residents at their properties. Changes in visual aspects of residential amenity will be considered in a 'Residential Visual Amenity Assessment' (RVAA) which typically considers effects on properties within 2.5 km of proposed turbine locations and will be required for this LVIA.

The RVAA will be carried out in accordance with the Landscape Institute guidance.

4.4.8 Visualisations

Visualisations and graphics used to support the assessment will include:

- ZTV maps analysing visibility of the proposed wind turbines to tip and hub heights as well as combined ZTV maps with other wind farms;



- photographs of existing views from the selected viewpoints;
- wireline images to illustrate theoretical visibility of the Proposed Development;
- photomontages to illustrate the predicted changes to views; and
- night-time photomontages for two to three viewpoints to illustrate the appearance of aviation lighting after dark.

Wirelines will include cumulative schemes and will be produced in accordance with NatureScot guidance.

4.4.9 Assessment of Cumulative Effects

The LVIA will consider operational wind farms and those under construction as part of the existing baseline.

The CLVIA will consider the current pattern of wind farms across the wider landscape and include consented and applications schemes (to approximately 45 km) but will focus on closer wind farms (up to 25 km) and the relationship that the Proposed Development would have with them.

The process for identifying wind farms to be considered in detail in the CLVIA will exclude single wind turbines of less than 50 m to blade tip height. Data will be collected for wind farms within 45 km of the Proposed Development. The assessment of effects will focus on those with the potential to have significant cumulative relationships with the Proposed Development, which tend to be those within approximately 15-20 km of the Proposed Development. Based on professional judgement, the cumulative study area will focus on consented and application sites located within 25 km study area from the outer turbines of the Proposed Development.

The CLVIA will assess the combined visual effects of the Proposed Development with other existing or reasonably foreseeable wind farms within the Study Area. The CLVIA will consider operational and consented schemes, and those which have undetermined applications or appeals. The CLVIA will seek to focus detailed assessment on the cumulative effects of the Proposed Development with developments most likely to have cumulative relationships with the Proposed Development that result in significant effects.

As noted above, the research to collect cumulative data will be undertaken using SLCs planning portal and ECU websites, a 'cumulative cut-off date' of 3 months prior to the Proposed Development submission is proposed to allow figures and assessment to be completed and to ensure that the most up to date information is illustrated. More distant scoping proposals and schemes with turbines below 50 m to blade tip height will not be included in the assessment.

The CLVIA will be carried out in accordance with the principles contained in NatureScot guidance on cumulative assessment. This methodology assesses different development scenarios with increasing levels of 'uncertainty'. Cumulative scenarios would include:

- Existing Scenario: this assesses the effects with all operational developments and those under construction present in the baseline and thus represents the LVIA;
- Consented Scenario: this scenario is somewhat speculative because it assumes that consented developments are also present in the landscape;
- In-planning Scenario: this is the most speculative scenario because it assumes all undetermined applications, as well as all developments included in the earlier



scenarios, are present in the landscape and therefore considers the effect of adding the Proposed Development into this landscape; and

- Observations on relationships with scoping stage sites will be made separately.

The intervisibility of the Proposed Development with other developments in the surrounding area will be explored by overlaying the ZTVs of other developments with that of the Proposed Development. Paired ZTVs would be prepared to illustrate the key relationships between the Proposed Development and other developments (or development groups) close to the Site. It is not proposed that exhaustive combined ZTVs will be produced, but rather that selected combinations will be used to illustrate key intervisibility relationships. Cumulative visual effects will be assessed through analysis of combined ZTVs, views from individual viewpoints and sequential views from routes.

The magnitude of additional cumulative change to views or landscape character is the additional influence the Proposed Development has on the views or character of the landscape, assuming the other developments are already present.

The cumulative assessment will consider the in-combination effects of emerging wind energy development patterns, and how the Proposed Development relates to these patterns and trends.

4.4.10 Designated Landscapes

The LVIA will review the baseline description and citations of designated landscapes within the ZTV and within the Study Area. Following the assessment of landscape and visual effects, there will be a review of the identified effects for landscape and visual receptors within those designated areas, and how the identified effects will affect the key qualities and reasons for designation. No separate assessment of effects on designated areas will be made, to avoid double counting.

4.4.11 Limitations and Assumptions

The assumptions and limitations that have been encountered during the production of this scoping report are as follows.

- Limitations to the LVIA include a reliance on bare-ground modelling for wireframes and ZTVs used in graphics, which does not take account of potential screening by buildings and vegetation. The theoretical visibility indicated by the bare-ground models is therefore an over-estimation of visibility. Actual visibility would be identified for receptors based on fieldwork and will also be illustrated in photomontages.
- It should be noted that illustrations and modelling cannot replace the need for site visits and can only be used to represent what people may see from the viewpoint. Whilst accuracy of modelling is essential, modelling can only be as accurate as the data used and cannot be used to replace field visits. It is noted also that the movement of the turbines may render them more noticeable in the view than static photographs/photomontages can portray.
- Limitations to the cumulative assessment include the uncertainty of whether the proposed wind farms would be built in the future. This includes consented schemes that may or may not be built. The assessment will also rely on data available at the 'cut-off' date, and it should be noted that the locations and specifications of turbines may change for proposed and consented schemes before they are actually built, through redesign and/ or micro-siting.



4.5 Additional Mitigation

There are some measures that will be beneficial to the landscape character of the Site and in providing screening to the substation, BESS and solar PV array related to the Outline Biodiversity Enhancement Management Plan and will be coordinated with the relevant ecologist.

4.6 Potential Impacts

The following provides an overview of the potential impacts at various stages of the Proposed Development:

4.6.1 Construction

The landscape and visual effects that could arise as a result of the Proposed Development during construction are identified as follows:

- Temporary effects on landscape character, primarily as a result of wind turbine installation during construction, with direct physical effects on the fabric on the landscape and on the character of the Site landscape relating to ground level structures, and indirect effects on the perceived effects on the character of the surrounding landscape; and
- Temporary visual effects on views, primarily as a result of visibility of ground level activity and structures as well as wind turbine installation during construction, experienced by people (visual receptors).

4.6.2 Operation

The landscape and visual effects that could arise as a result of the Proposed Development during operation are identified as follows:

- Long-term effects on landscape character, as a result of wind turbine operation and ground level structures, either affecting the pattern of elements that define the character or affecting the visual/ perceptual characteristics of landscape character;
- Long-term visual effects as a result of the Proposed Development on nearby views, with effects as a result of wind turbine operation on wider views, experienced by people at places with visibility of different elements of the Proposed Development. This includes effects of aviation safety lighting after dark and effects on the visual aspects of residential amenity for properties close to the Site;
- Cumulative effects of the Proposed Development in combination with consented and proposed wind farm schemes across the wider area, including combined, successive and sequential visibility; and
- Implications of significant effects identified in or affecting designated landscapes, which may affect their special qualities and reasons for designation.

4.6.3 Decommissioning

The effects of the Proposed Development during decommissioning would be similar to those identified during construction but would reduce as decommissioning proceeds.



4.7 Receptors and Impacts Scoped out of Assessment

To allow focusing of the assessment, the LVIA Chapter of the EIA Report will identify where receptors are unlikely to be affected by the Proposed Development, either through having little or no theoretical visibility, or being distant from the Proposed Development, those receptors will be scoped out of the LVIA Chapter. In addition to this, the scope of reporting will be further focused on those effects that are found to be significant or contribute to the meaningful discussion of landscape and visual effects of the Proposed Development.

Likely to be scoped out of the LVIA Chapter, on the basis of initial fieldwork and ZTV coverage, are the following elements (distances from the outer turbines):

- Effects on landscape character beyond approximately 15 km;
- Effects on views from viewpoints beyond approximately 25 km, although there would be locations where the Proposed Development would be visible at greater distances;
- Effects on views from routes beyond approximately 25 km;
- Effects on views from local paths (Core Paths and locally promoted paths) beyond approximately 5 km;
- Effects on views from settlements beyond approximately 10 km;
- Effects on designated landscapes beyond approximately 25 km;
- Cumulative effects with turbines of less than 50 m to blade tip; and
- Decommissioning effects, which are similar to, but in reverse of construction effects, reducing on completion.

No receptors or impacts will be scoped out prior to the confirmation of the final layout, details on aviation lighting requirements and turbine tip height included in the Proposed Development.

4.8 Scoping Questions to Consultees

The following are questions to consultees:

- Q4.1 - Do consultees agree with the extent of the Study Areas proposed?
- Q4.2 - Are consultees content with the proposed methodology for the LVIA?
- Q4.3 - Are consultees content with the proposed approach to undertaking viewpoint photography and preparing visualisations?
- Q4.4 - Are consultees content with the proposed viewpoints identified in **Table 4.1**, and could they advise of any additional viewpoints they consider necessary to assess the effects of the Proposed Development or indeed any that you think are not required?
- Q4.5 - Are consultees content with the proposed approach to the cumulative assessment and could they advise of any specific cumulative sites they consider should be included in the assessment?
- Q4.6 - Do consultees agree that there are unlikely to be significant effects from decommissioning of the Proposed Development and accordingly this will be scoped out of the LVIA?



5.0 Ecology

5.1 Introduction

This Section details the approach to baseline ecological information gathering and the proposed scope and methodology of the assessment of potentially significant effects upon Important Ecological Features (IEFs).

Potential impacts upon ecological features will be considered throughout the design process for the Proposed Development, and where possible, will either be avoided completely through design or will be prevented / minimised via good practice embedded mitigation measures.

5.1.1 Study Area

The EIA Report Ecology chapter will incorporate the following study areas which will all be buffered from the finalised turbine and solar layout (and access track/ other infrastructure if relevant/ required):

- Designated sites: the proposed turbines / solar array and infrastructure and a 5 km study area from the Site boundary (**Figure 5.1**).
- Protected species: the proposed turbines / solar array and infrastructure and species-specific buffers as necessary.
- Electrofishing surveys (carried out by Clyde River Foundation): watercourses within the Site boundary and downstream as deemed relevant.
- Potential bat roost features: the proposed turbine locations and a 200 m plus turbine blade length buffer (as per NatureScot *et al.* 2021).
- Habitats and potential Groundwater Dependent Terrestrial Ecosystems (GWDTE) within the Site boundary.
- Bat collisions: the proposed turbine locations; static bat data will be processed through Ecobat (Mammal Society 2017).
- Cumulative assessment (if required): the proposed turbines/ solar array and infrastructure and a 5 km study area from the Site boundary.

5.2 Baseline Description

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

- a desk study to confirm the location and qualifying features of designated sites and ancient woodland within potential zones of influence of the Proposed Development;
- information from the Carbon and Peatland Map 2016 and Phase 1 Peat probing survey data;
- information from the National Biodiversity Network (NBN) Atlas on ecological records within 5 km of the Site within the last 15 years (since 2010);
- information from the Deer Distribution Survey by the British Deer Society;
- information from the Saving Scotland's Red Squirrels (SSRS) website for red and grey squirrel sightings;



- Environmental Statements (ES), EIA Reports or technical reports from other developments or proposed developments in the local area; and
- results of the ecological surveys undertaken between April and October 2024.

5.2.1 Desk Study

Designated Sites

There are no statutory designations within the Site. One statutory site designated for ecology lies within 5 km of the Site (**Figure 5.1**); Shiel Dod Site of Special Scientific Interest (SSSI) lies approximately 4.6 km to the south of the Site and is designated for its Upland Assemblage (assemblage of upland vegetation communities, condition favourable maintained as of 16 October 2005).

The Ancient Woodland Inventory (AWI) Scotland showed no ancient woodland within the Site, and several parcels of ancient woodland within 5 km of the Site (**Figure 5.1**). The closest parcel of ancient woodland lies approximately 0.2 km to the north of the Site and is classified as long-established (of plantation origin). Several areas of ancient woodland lying along linear topographical features are located to the south-east of the Site; these are classified as ancient (of semi-natural origin).

Carbon and Peatland Map

The Carbon and Peatland Map 2016 shows that the Site comprises mainly expanses of mineral soil, Class 3 and Class 4 soils. There are five areas of potential Class 1 peatland shown within the Site; three of these are along the southern boundary of the Site, one lies on the southern slope of Brown Hill, and one is a very small area that lies on the western site boundary to the north (**Figure 5.2**). No turbines are currently proposed on any area of Class 1 peatland.

Online Resources

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 (i.e., since 2010):

- roe deer (*Capreolus capreolus*);
- Natterer's bat (*Myotis nattereri*);
- noctule (*Nyctalus noctula*);
- common pipistrelle (*Pipistrellus pipistrellus*);
- soprano pipistrelle (*P. pygmaeus*);
- red squirrel (*Sciurus vulgaris*);
- adder (*Viper berus*); and
- common lizard (*Zootoca vivipara*).

The invasive non-native species (INNS) American signal crayfish (*Pacifastacus leniusculus*) and grey squirrel (*Sciurus carolinensis*) were also recorded.

The Deer Distribution Survey showed the likely presence of Sika deer (*Cervus nippon*), red deer (*Cervus elaphus*), roe deer and fallow deer (*Dama dama*) in the Site or surrounding area.



The Saving Scotland's Red Squirrels sightings portal shows that sporadic sightings of both red squirrel and grey squirrel have been recorded within 5 km of the Site over the past 15 years.

Local Developments

The scoping report for Watchman Energy Park, which is adjacent to the Site, noted that field surveys had confirmed presence of common pipistrelle, soprano pipistrelle, noctule, Leisler's (*Nyctalus leisleri*), Daubenton's bat (*Myotis daubentonii*), Natterer's bat, brown long-eared bat (*Plecotus auritus*), otter (*Lutra lutra*), water vole (*Arvicola amphibius*), reptile species and non-migratory brown trout (*Salmo trutta*). The INNS American signal crayfish was also found at the Site.

5.2.2 Field Surveys

The following baseline ecological surveys have been undertaken to date:

- Seasonal static bat detector (Anabat surveys) were undertaken between April and September 2024, over three deployments in accordance with NatureScot *et al.* guidelines. Ten detectors were deployed around 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 are proposed to be located. Species recorded by these surveys were common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle (*Pipistrellus nathusii*), noctule, Daubenton's, Natterer's and brown long-eared bat.
- Protected species walkover surveys were conducted in May 2024. Otter spraints and feeding signs were found along the watercourses on Site, common lizards were sighted and potential hibernacula were identified. Trees and structures with potential roosting suitability for bats were also noted.
- Electrofishing and fish habitat suitability surveys on watercourses within the Site (upstream and downstream) were undertaken in June 2024 by the Clyde River Foundation in line with guidance. Brown trout and the INNS American signal crayfish were found at all sampling locations. No migratory fish species can access the Site as the Falls of Clyde, downstream of the Site, is a barrier to migration.
- National Vegetation Classification (NVC) surveys, incorporating Phase 1 Habitat and potential GWDTE habitat classification were undertaken in October 2024 in line with guidance. The habitat surveys undertaken show that marshy grassland is prevalent across the site, with mosaics of other habitats. Blanket bog and wet modified bog were found mainly in the south of the Site.

5.3 Embedded Mitigation

Significant impacts on ecological features will be avoided or minimised where possible within the design process. Good practice during construction and operation of the Proposed Development will be implemented as standard (and the assessment undertaken on this basis). This would include the following:

- implementation of a comprehensive, site-specific and robust Construction Environmental Management Plan (CEMP) or similar during the construction phase, including implementation of appropriate pollution prevention (particularly in relation to watercourses);



- implementation of a Species Protection Plan (SPP) to ensure that all reasonable precautions are taken to adhere to the relevant wildlife legislation, including carrying out pre- and during-construction surveys;
- presence of an Ecological Clerk of Works (ECow) during the construction period; and
- adherence with operational phase environmental management plans following relevant best practice and guidance during operation, including provisions for, but not limited to, ongoing pollution prevention control measures.

5.4 Assessment Methodology

The EIA Report will include an Ecological Impact Assessment (EclA). This will consider the potential direct, indirect and cumulative impacts that the construction, operation and decommissioning phases of the Proposed Development could have on IEFs, as per CIEEM (2018) guidance. The assessment will be supported by appendices that will include details of survey methodologies and all survey data.

The assessment will include the following elements:

- baseline conditions;
- scoping in/ out of ecological features and impacts;
- assessment of potential impacts and effects on IEFs during construction and operational phases;
- cumulative effects;
- mitigation; and
- 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 (2018) and Scottish Government (2017b).

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 (NCV) 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);
- making a judgement based on the above information as to whether or not the consequent potential effect would be significant with respect to the EIA Regulations;
- if a potential effect is determined to be significant, measures to avoid or reduce the significance of effects are considered;
- considering opportunities for enhancement where appropriate; and
- concluding residual potential effects after considering mitigation, compensation and enhancement.



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 wind farm 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 scope of the cumulative assessment will be agreed in consultation with NatureScot.

5.5 Additional Mitigation

All mitigation, compensation and enhancement measures for the Proposed Development will be provided in the EIA Report in due course. Any additional mitigation measures deemed to be necessary will be informed by consultation with key sources and organisations, a review of all field and desk study outcomes and professional experience and expertise.

5.6 Potential Impacts

The assessment will consider the potential impacts associated with construction, operation and decommissioning of the Proposed Development as detailed below. Where appropriate, the construction and operational impacts will also be considered in a cumulative assessment.

Construction/Decommissioning Impacts:

- temporary and permanent habitat loss/alteration/fragmentation/drainage associated with the Proposed Development infrastructure;
- pollution impacts on watercourses within the Site;
- potential translocation of INNS to new locations;
- loss of shelter, breeding or foraging habitat for 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:

- displacement of protected species from shelter, breeding or foraging habitats around operational turbines and other permanent infrastructure, including barrier effects; and
- risk of bats colliding with or suffering barotrauma from proximity to operational wind turbine blades.

5.7 Receptors and Impacts Scoped in or out of Assessment

A summary of the features and impacts to be considered, and the phases for which they are likely to be scoped in or out for, are presented in Error! Reference source not found.. Decommissioning impacts are not included as they are assumed to be similar to those from construction.



Table 5.1: Summary of Features and Impacts for Ecology

Features	Scoped In		Justification
	Construction	Operation	
Protected species (including bats)	Yes	Yes	Protected species cannot be scoped out until the distribution of ecological features in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood.
Habitats on Annex I to the Habitats Directive	Yes	Yes	Habitats on Annex I to the Habitats Directive cannot be scoped out until the presence and distribution of such habitats in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood.
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).	No	No	On the basis of the results of the desk-based work undertaken to date, the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards, generally common and widely distributed habitats or species which do not fall within the categories listed in the feature column will be scoped out of the assessment.
Wild deer population	Yes	No	The desk-based study will collate relevant information on the deer populations in the locality to inform whether this should be scoped out at the construction phase or assessed further in the EIA report. It is considered that the operational activities of the Proposed Development are unlikely to result in an adverse impact upon the deer population and are scoped out of the assessment.
Designated sites	No	No	There are no statutory designations within the Site, but there is one statutory site designated for ecology located within 5 km of the Site. Shiel



Features	Scoped In		Justification
	Construction	Operation	
			Dod SSSI, designated for its Upland Assemblage, lies approximately 4.6 km from the Site; it is not topographically or hydrologically connected to the Site. Through the adoption of embedded mitigation (including the design and layout of the Site), it is considered that designated sites are unlikely to be affected by the operational activities of the Proposed Development.
Migratory salmonids and resident fish	No	No	Migratory salmonids are scoped out of the assessment. Migratory salmonids are not able to access the Site or local area due to impassable barriers much further downstream in the Clyde catchment (i.e. the Falls of Clyde at Lanark). Impacts on resident fish populations during construction cannot be scoped out until the ecological baseline surveys are complete and the presence and distribution of species and suitable habitats in relation to the planned infrastructure and activities are fully understood. The operational activities of the Proposed Development are unlikely to provide an adverse impact upon the resident fish populations and are scoped out of the assessment at this stage.

5.8 Scoping Questions to Consultees

The following are questions to consultees:

- Q5.1 - Are there any other relevant consultees who should be consulted, or other sources of information that should be considered?
- Q5.2 - Do consultees agree that the suite of field surveys undertaken in addition to a desk study are sufficient to inform a robust ecological impact assessment?
- Q5.3 - Do consultees agree that the methodology and scope of assessment is appropriate?



- Q5.4 - Do consultees agree with the features proposed to be scoped out from further assessment as detailed in **Table 5.1**?



6.0 Ornithology

6.1 Introduction

This Section of the EIA Scoping Report details the approach to baseline ornithological information gathering and the proposed scope and methodology of the assessment of potentially significant effects upon Important Ornithological Features (IOFs) and is supported by the following figures:

- **Figure 6.1:** Ornithological Designated Sites
- **Figure 6.2:** Vantage Point Survey Locations and Viewsheds;
- **Figure 6.3:** Ornithological Survey Areas – 2023-2024; and
- **Figure 6.4:** Ornithological Survey Areas – 2024-2025.

The potential for significant effects upon ornithological features will be considered throughout the design process of the Proposed Development, and where possible will either be avoided completely through design iteration or will be prevented/minimised via good practice industry standard embedded mitigation measures.

All measures required to avoid, minimise or offset any potentially significant adverse effects upon IOFs and opportunities to enhance baseline ornithological conditions as part of the Proposed Development will be set out within the Ornithology chapter of the EIA Report.

6.1.1 Study Area

The Ornithology chapter of the EIA Report will adopt the following study areas within which baseline information in relation to ornithological features will be compiled:

- 20 km for statutory designated sites with qualifying ornithological features, with 20 km comprising the maximum core dispersal and/or foraging distance of ornithological qualifying features from SPAs cited within NatureScot guidance (SNH 2016b); and
- 2 km for species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and Annex 1 of NatureScot guidance (SNH 2018a), extended to 6 km for eagle species, as recommended within NatureScot guidance (NatureScot 2025).

Field survey areas adopted have been based on the largest possible turbine layout and ancillary infrastructure for the Development within the Site applicable at the time of surveys, and are detailed in **Section 6.2.3**.

6.2 Baseline Description

Baseline ornithological studies to inform the design and assessment of the Proposed Development commenced in September 2023. Once completed, these studies will comprise a desk based review of existing ornithological information and two full consecutive years of ornithological field surveys, as recommended in NatureScot guidance (SNH 2017).

This section provides a summary of baseline ornithological studies that have been conducted from commencement of surveys in September 2023 to August 2024. Surveys are ongoing and are due to be completed in August 2025.

Full details of all baseline studies completed including survey results, methodology and field conditions will be provided in the Ornithology chapter of the EIA Report, associated Technical Appendices and Figures.



Information pertaining to the locations of breeding sites of birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) will be restricted to a Confidential Volume of the EIA Report in accordance with NatureScot guidance (SNH 2016b). This volume of the EIA Report will not be made publicly available but will be provided to the Energy Consents Unit (ECU), NatureScot and Royal Society for the Protection of Birds (RSPB) Scotland who have a duty to consider such information during their own appraisals of the Proposed Development.

6.2.1 Designated Sites

Table 6.1 provides a summary of designated sites with ornithological qualifying features located within 20 km of the Site Boundary – the maximum core range of breeding and non-breeding qualifying features from Special Protected Area (SPA) boundaries, set out in NatureScot guidance (SNH 2016a).

In review of each designations qualifying interests and connectivity distances set out in NatureScot guidance (SNH 2016a) there is considered to be no likely connectivity between the Proposed Development and any of the designated sites on account of spatial separation.

Table 6.1: Ornithological designated sites within 20km of the Proposed Development.

Site Name	Designation	Distance	Qualifying features
Muirkirk and North Lowther Uplands	SPA	~14 km	Breeding: golden plover, hen harrier, merlin, peregrine falcon, short-eared owl. Non-breeding: hen harrier.
North Lowther Uplands	SSSI	~14 km	Breeding: hen harrier. Breeding bird assemblage which is cited to include: short-eared owl, merlin, peregrine falcon, golden plover, red grouse, raven, dunlin, snipe, teal, curlew, redshank, whinchat and wheatear
Muirkirk Uplands	SSSI	~20 km	Breeding: hen harrier, short-eared owl. Non-breeding: hen harrier. Breeding bird assemblage which is cited to include: teal, buzzard, merlin, peregrine, red grouse, golden plover, dunlin, snipe, curlew, redshank, whinchat, stonechat, wheatear and ring ouzel.
Tweedsmuir Hills	SSSI	~17 km	Breeding bird assemblage which is cited to include: red grouse, black grouse, golden plover, curlew, dunlin, common snipe, ring ouzel, whinchat, stonechat and wheatear.

6.2.2 Desk Study

The following key sources will be consulted for existing ornithological information:

- RSPB Data Unit;
- South Strathclyde Raptor Study Group (SSRSG);
- Dumfries and Galloway Raptor Study Group (DGRSG); and
- South of Scotland Golden Eagle Project (SSGEP); and



- Southern Upland Partnership (SUP).

Information will be requested within at least 2 km of the Proposed Development, extended to 6 km for eagle species.

Publicly available ornithological information from other relevant developments in the vicinity of the Site will also be reviewed as part of the desk-based study.

6.2.3 Field Surveys

The following ornithological field surveys have been completed, or are otherwise proposed for completion between September 2023 and August 2025:

- Flight activity surveys (2023/2024 and 2024/2025 non-breeding seasons and 2024 and 2025 breeding seasons);
- Scarce breeding bird surveys (2024 and 2025 breeding seasons);
- Moorland breeding bird surveys (2024 and 2025 breeding seasons);
- Black grouse surveys (2024 and 2025 breeding seasons); and
- Winter walkover surveys (2023/2024 and 2024/2025 non-breeding seasons).

Once completed this will comprise two full consecutive years of survey as recommended in NatureScot guidance (SNH 2017).

All field surveys have followed methodologies recommended by NatureScot (SNH 2017), including species-specific survey methodologies as set out in Hardey *et al.* (2013) and Gilbert *et al.* (1998). The selection of target species for survey and recorded has been informed by both preliminary site visits and NatureScot guidance applicable at the time of survey commencement (SNH 2017 and 2018a).

6.2.3.1 Flight Activity Surveys

Flight activity surveys to quantify the level and distribution of target species flight activity within proximity to potential turbine locations were commenced in September 2023 from three Vantage Point (VP) locations and which provide coverage of proposed turbine locations (See **Figure 6.2**). Surveys will be completed in August 2025, using the same three VP locations.

In accordance with NatureScot (SNH 2017) guidance, a total of 36 hours of survey effort was or will be undertaken at each of the three VPs per survey season. A summary of flight activity observational effort (hours) completed and *proposed* to the end of August 2025 is included in **Table 6.2**.

Over the course of surveys to the end of August 2024 (i.e. first full year of surveys), flight activity from a total of 12 target species has been recorded, including: black grouse, curlew, goshawk, greylag goose, hen harrier, herring gull, lapwing, merlin, osprey, peregrine falcon, pink-footed goose and red kite.

Table 6.2: Flight activity survey summary.

Survey Period	VP1	VP9	VP10
2023/2024 Non-breeding Season	36.5	36	36
2024 Breeding Season	30	42	36
2024/2025 Non-breeding Season	36	36	36



Survey Period	VP1	VP9	VP10
2025 Breeding Season	36	36	36

6.2.3.2 Scarce Breeding Bird Surveys

Scarce breeding bird surveys were conducted between March and August, over the 2024 breeding season. The survey area has comprised the Site boundary and a 2 km buffer, as illustrated in **Figure 6.3** and **6.4**.

Surveys recorded roosting barn owl at single location outside of the Site boundary and a confirmed breeding attempt was identified for red kite, also outside of the Site boundary.

Observations of goshawk, hen harrier, merlin and osprey were also made over the course of surveys during the 2024 breeding season, although no breeding evidence was recorded.

Further surveys will be undertaken over the 2025 breeding season and consultation will be undertaken with the RSPB Data Unit, the DGRSG and SSRSG and the SSGEP to provide context for observations made and obtain additional existing records of scarce breeding raptors and owls within the wider study area.

6.2.3.3 Moorland Breeding Bird Surveys

Moorland breeding bird surveys were conducted between April and July, over the 2024 breeding season. The survey area has comprised the Site boundary and a 500 m buffer, as illustrated in **Figure 6.3** and **6.4**.

Surveys identified a breeding assemblage of eight wader species: common sandpiper, curlew, lapwing, little ringed plover, oystercatcher, redshank, ringed plover and snipe.

Observations of golden plover were also recorded; however, no evidence of breeding was identified for this species.

Further surveys will be undertaken over the 2025 breeding season and consultation will be undertaken with the RSPB Data Unit to identify any additional existing records of breeding waders and other breeding moorland species within the wider study area.

6.2.3.4 Black Grouse Surveys

Targeted surveys for lekking black grouse were conducted in April and May 2024. The survey area has comprised the Site boundary and a 1.5 km buffer, as illustrated in **Figure 6.3** and **6.4**.

Surveys identified a single lek location within the survey area, located within the Site and which supported a single male.

Further surveys will be undertaken in April and May 2025, and consultation will be undertaken with the RSPB Data Unit and the SUP to obtain any additional existing records of lekking black grouse within the wider study area.

6.2.3.5 Winter Walkover Surveys

Winter walkover surveys were conducted over the 2023-2024 non-breeding season in order to identify any aggregations of non-breeding target species. Surveys were conducted in the north of the Site as shown in **Figure 6.3**, based on the layout of development infrastructure applicable at the time.



No evidence of Schedule 1 raptor winter roost locations or aggregations of migratory waterfowl were identified within the survey area during the 2023-2024 winter walkover study period.

Further surveys have been undertaken over the 2024/2025 non-breeding season within the survey area shown in **Figure 6.4** and comprising the Site boundary and a 500m buffer.

Consultation will also be undertaken with the RSPB Data Unit, the DGRSG and SSRSG and the SSGEP to provide context for observations made and obtain additional existing records of scarce breeding raptors and owls within the wider study area.

6.3 Embedded Mitigation

The design of the Proposed Development will seek to avoid and/or minimise any significant effects on birds, based on the known locations of breeding sites, potential roosts and key foraging habitats identified during baseline studies, and adoption of suitable bird disturbance distances set out in accordance with Goodship and Furness (2022) in so far as is possible.

Good practice measures, as set out in NatureScot guidance (SNH 2016c) during construction/decommissioning and operation of the Proposed Development will also be implemented (and the assessment undertaken on this basis).

This will include the following:

- A Bird Disturbance Management Plan (BDMP) will be included as part of the finalised Construction Environmental Management Plan (CEMP) for the Proposed Development. This will detail good practice and species-specific measures to be implemented during construction, decommissioning and where relevant during operational maintenance activities, to enable legislative compliance and safeguard sensitive bird species including those listed on Schedule A1, 1 and 1A of the Wildlife and Countryside Act 1981 (as amended) and black grouse (as per NatureScot 2024a). The finalisation of the BDMP would be undertaken in consultation with relevant stakeholders following planning consent and informed by information obtained during baseline studies, pre-commencement surveys and industry good practice.
- Any disturbance areas around permanent infrastructure and/or construction compounds during construction will be temporary and land will be reinstated or restored before the construction period ends in accordance with the Proposed Development's CEMP, based on the Outline CEMP to be submitted within the EIA Report.
- Any borrow pits excavated during the construction period will be reprofiled at the end of the construction period, also in accordance with the CEMP.
- An Ecological Clerk of Works (ECoW) will also be appointed to conduct pre-commencement surveys and ensure legislative protections afforded to wild birds are taken into due consideration and adhered to throughout the construction phase and where relevant during the operation of the Proposed Development.

6.4 Biodiversity Enhancement

A Biodiversity Enhancement Management Plan (BEMP) will also form part of the Proposed Development, and an Outline Biodiversity Enhancement Management Plan (OBEMP) will be submitted as part of the EIA Report.

The OBEMP will present draft habitat and species conservation management measures that will be committed to as part of the Proposed Development, and which will contribute to the



enhancement of biodiversity in accordance with the principals of National Planning Policy Framework 4 (NPF4) Policy 3: Biodiversity, through restoring degraded habitats and creating and strengthening nature networks.

The finalisation of management measures and areas over which those measures take place, would be undertaken in consultation with relevant stakeholders following planning consent and any further site-investigation as required.

6.5 Assessment Methodology

The assessment presented within the Ornithology Chapter of the EIA Report will be undertaken adopting established approaches to the assessment of onshore wind farm developments in Scotland, as recommended in NatureScot guidance (NatureScot 2024b and 2025) and impact assessment guidance published by the Chartered Institute of Environmental and Ecological Management (CIEEM, 2018).

The assessment will consider in detail only those impacts upon IOFs considered sensitive to wind farm developments, as set out in Annex 1 of NatureScot guidance (NatureScot 2025), and upon which potentially significant effects may occur. Impacts upon IOFs will be assessed in relation to the species' relevant reference population, conservation status, range and distribution, based on best available evidence.

The assessment will be supported by technical appendices and figures as appropriate and will include the following stages:

- description of the ornithological baseline;
- scoping in/out of IOFs and associated impacts;
- identification and evaluation of potentially significant effects by employing appropriate guidance and professional judgement;
- identification of mitigation measures to avoid or otherwise reduce potentially significant effects;
- assessment of the significance of any residual effects after such measures;
- identification of appropriate compensation measures to offset significant residual effects;
- identification of opportunities for enhancement; and
- cumulative effects assessment, where required.

The approach to assessment will also take account of existing guidance and published scientific literature in relation to birds and windfarms, together with professional judgement and experience of renewable energy EIAs.

6.6 Additional Mitigation

All mitigation and compensation measures required to address potentially significant effects upon IOFs as a result of the Proposed Development, or enable legislative compliance during the construction and where relevant during the operation of the Proposed Development, will be set out within the Ornithology chapter of the EIA Report.



6.7 Potential Impacts

The assessment will consider the following three main potential impacts upon IOFs associated with construction, operation and decommissioning of the Proposed Development:

- habitat loss through wind farm construction;
- mortality risk through collision with operational turbines/ other infrastructure; and
- disturbance/displacement (indirect habitat loss) through the avoidance of construction activities and operational wind farm infrastructure including barrier effects.
- Where appropriate the potential for significance effects impacts will also be considered in-combination with other relevant developments.

6.7.1 Construction Impacts

6.7.1.1 Habitat Loss

Direct land take resulting from the construction of the Proposed Development could result in long-term or permanent loss of habitat for birds within the Site. Such losses are however generally considered small relative to the area of those habitats within the Site or available locally.

6.7.1.2 Disturbance

Construction activities may be predicted to result in a temporary increase in noise, vibration and human presence within construction areas. This has the potential to displace breeding, foraging or roosting birds from the vicinity of construction areas for the duration of construction works.

Impacts would likely be greatest during the breeding season (generally from March to August) but are variable between location and species. The potential for disturbance to occur to breeding sites of specific species will therefore be assessed on the basis of best available species guidance, including Goodship and Furness (2022) which will be referred to within the EIA Report.

Overall construction disturbance would be considered temporary and would only occur when construction works were being carried out. Construction works would also not be expected to take place across the whole of the Site at once but phased within smaller defined working areas across the Site.

Measures to enable legislative compliance during construction works in relation to all bird species and those afforded additional protection under the provisions of the Wildlife and Countryside Act 1981 (as amended) will also be outlined within the Ornithology chapter of the EIA Report for inclusion within a BDMP for the Proposed Development.

6.7.2 Operational Impacts

6.7.2.1 Disturbance, Displacement and Barrier Effects

The operation of wind farm infrastructure has the potential to disturb or displace bird species utilising the Site. Certain species may habituate to the presence of turbines and this impact may decline over the lifetime of the wind farm.



The potential for disturbances to individual species or species groups will therefore be assessed on the basis of best available species guidance, including Goodship and Furness (2022^{Error! Bookmark not defined.}), and which will be referred to within the EIA Report.

6.7.2.2 Collision Mortality Risk

The operation of the Proposed Development also has the potential to result in the risk of collisions with operational turbines or other installed infrastructure. Where the level of flight activity requires it, the NatureScot collision risk model (Band et al., 2007) will be used to estimate and assess potential collision mortality risks for target species.

6.7.3 Decommissioning

The potential for impacts on IOF's resulting from the decommissioning of the Proposed Development, including the removal of infrastructure from the Site are considered to be similar to those identified for the construction phase.

As such, the associated effects of decommissioning will not be assessed exclusively for IOFs within the EIA Report, but considered with reference to predicted construction phase effects.

6.7.4 Cumulative Impacts

A cumulative assessment will be undertaken for each of the IOFs identified within the EIA Report, in accordance with NatureScot guidance (SNH, 2018) and where potentially significant effects are considered likely.

Where undertaken, the assessment will include operational projects, projects under construction, consented projects which are not yet under construction, and projects for which planning applications have been submitted with final design and full baseline information available in the public domain.

NatureScot guidance (SNH 2018) indicates that cumulative assessment conducted at the Natural Heritage Zone (NHZ) scale is appropriate for breeding species not connected to designated sites. The Proposed Development overlaps two NHZs: Western Southern Uplands and Inner Solway (NHZ 19) and Border Hills (NHZ 20).

NatureScot will be consulted prior to the completion of the cumulative assessment for its record of cumulative impacts to ornithological features arising from onshore wind farm proposals at each NHZ scale.

Where other geographic scales are considered more appropriate for individual species or species-groups, these will be set out and justified within the EIA Report.

6.8 Receptors and Impacts Scoped in or out of Assessment

It is not possible to definitively identify all IOFs and impacts that will be scoped-in to or out of assessment, prior to the completion of baseline studies and final design of the Proposed Development.

However, on the basis of information collated on species activity and distributions to date, it is likely that IOFs scoped into assessment will include black grouse, breeding curlew and red kite.

NatureScot guidance (2024b and 2025 and SNH 2017) and CIEEM guidelines (2018) do also stipulate that the detailed assessment of impacts upon ornithological features that are widespread, unthreatened, and/or resilient to construction and operations of windfarms with



standard mitigation, is not necessary. This includes species that do not require surveys to inform the EIA but will require mitigation in order to comply with legislation e.g. breeding passerines.

As such, with the support of relevant guidance and professional judgement, ornithological features which do not require detailed assessment, or are not expected to be significantly affected at a population level based on established baseline conditions, are proposed to be 'scoped out' of the impact assessment process. Embedded and/or specific mitigation measures for such features may however, still be outlined as appropriate within the EIA Report, to reduce or avoid any potentially adverse effects, or to enable legislative compliance during construction, decommissioning or operational maintenance works.

It is proposed that the following receptors and impacts will therefore be scoped out of the assessment:

- All passerine species, which are generally not indicated to be significantly vulnerable to wind farm developments (SNH 2017).
- Species deemed to be of low conservation value, including those not recognised as requiring special conservation measures and not listed on non-statutory lists which present bird species whose populations are at risk, specifically:
 - Species not listed as Annex 1 or Schedule 1 species; and
 - Species not listed as red-listed Birds of Conservation Concern.

Following a review of designated sites within 20 km of the Site with ornithological qualifying features (**Table 6.1**) there is considered to be no likely connectivity between the Site and any such designation. The potential for Likely Significant Effects (LSEs) upon designated sites is considered unlikely and will be scoped out of the EIA Report.

At this stage, it is also proposed that the potential for significant impacts upon foraging non-breeding migratory waterfowl (including geese, swans and waders) can be scoped out, in the absence of such recorded to date and low suitability of habitats for such within the Site. The Site is located outside of known migratory goose feeding areas (according to Mitchell 2012) and it is not NatureScot's general advice that collision mortality risks for pink-footed geese need only to be assessed if a development has connectivity with a designated site for the species.

Baseline studies have also not identified the importance of the Site for species susceptible to elevated risks to collisions with lit turbines (NatureScot 2020) and as such impacts upon ornithological features relating to turbine, or any other infrastructure lighting where this is proposed, will not be assessed within the EIA Report.

6.9 Scoping Questions to Consultees

The following are questions to consultees:

- Q6.1 - Do the consultees agree that scope of the field surveys and desk study that have been completed, or are otherwise proposed for completion, will be sufficient to inform the assessment?
- Q6.2 - Do the consultees agree that embedded mitigation measures set out are appropriate and in accordance with industry good practice?
- Q6.3 - Do the consultees agree with the ornithological features and impacts to be scoped in or out of the assessment at this time?



- Q6.4 - Do consultees consider there to be any current or proposed local conservation initiatives that the Proposed Development could look to support as part of its contribution to restoring degraded habitats and creating and strengthening nature networks?



7.0 Cultural Heritage

This section outlines the proposed scope and methodological approach for the Archaeology and Cultural Heritage chapter of the EIA Report. The chapter would 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 Designed Landscapes (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 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.
- It will consider direct effects (such as physical disturbance or effects through setting change), indirect effects (such as increased pollution or changes in water draining patterns which can indirectly affect the preservation of heritage materials), effects on setting of heritage assets, and cumulative effects (where assets affected by the Proposed Development are also likely to be affected by other unrelated development proposals).

The Site is located within the South Lanarkshire Council area. The proposed Study Area includes areas and heritage assets which are in Dumfries and Galloway Council and Scottish Borders Council areas.

The proposed approach to the assessment of effects on cultural heritage is set out within this Scoping Report section, supported by:

- **Appendix A** – Cultural Heritage Appraisal; and
- **Figure 7.1** – Designated Cultural Heritage Assets – Turbine ZTV.
- **Figure 7.2** – Cultural Heritage Wirelines



7.1 Baseline Description

7.1.1 Overview

A high-level review of the baseline conditions has been undertaken with reference to the available historic environment data and the Scoping layout described in **Section 2** of this Scoping Report. This is subject to change according to subsequent design iterations.

7.1.2 Assets within the Site Boundary

There are two designated assets within the Site boundary. These are Crooked Stone, standing stone (SM4238) and Crookedstane, platform settlement (SM4647). Both assets are prehistoric in date and lie in the northern portion of the Site, c. 725m and 405m to the west of the nearest turbine (T1) respectively.

There are a further 52 non-designated heritage assets within the Site boundary. These non-designated heritage assets are varied in date and function but largely date to the prehistoric period. There are two main areas where prehistoric activity is clustered – in the north at Crookedstane, and in the southern portion of the Site near Wintercleugh Burn. There is a clear distribution of activity within all periods represented (prehistoric, medieval, and post-medieval) in the northern portion of the Site. WoSAS have labelled a non-designated platform settlement (WoSAS ID 10417) as “almost certainly of national importance”, located c. 400 m to the south-west of Crookedstane, platform settlement (SM4647) and additional features of the aforementioned scheduled monument which extend outwith the scheduled area.

Activity from these periods is generally agricultural or settlement related, clustering on the natural terraces along the River Clyde and the drainage of Crookedstane Burn. The confluence of these two watercourses would have created an advantageous and resource rich environment for settlement. There are several burnt mounds and burial cairns scattered across the Site, indicating prehistoric activity outwith the known agricultural and settlement assets. Medieval rig and furrow is present in the north along the river terrace of the River Clyde and post-medieval farmsteads, enclosures, and field boundaries are scattered throughout the Site along the drainage burns from the hills.

The land at Crookedstane Farm in the north of Site near Elvanfoot (WoSAS ID 960) was excavated prior a proposed pipeline construction. The results indicated a multi-phase farm complex in use from the early prehistoric period until at least the medieval period.

The area to the east of the Site has previously been subject to a walkover survey ahead of the Cultural Heritage Assessment of Clyde Wind Farm (WoSAS ID 3204) in 2003. Several areas of archaeological interest were identified from a range of periods.

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

7.1.3 Assets outwith the Site Boundary

Within 10 km of the Proposed Development turbines there are a total of 93 designated cultural heritage assets. In total, this is composed of 61 Scheduled Monuments, two Conservation Areas, one Garden and Designed Landscape and 29 Listed Buildings. Of the Listed Buildings, there are 4 Category A Listed Buildings 13 Category B and 12 Category C. There are no Inventory Battlefields within 10 km of the Site.



7.2 Potential Sources of Impact

7.2.1 Potential Sources of Impact within the Site Boundary

As stated, there are two scheduled monuments and an additional 52 non-designated recorded assets within the Site boundary. Whilst positioned outside of the current placement of the turbines, these known cultural heritage assets may be susceptible to a significant level of direct (physical) or indirect impact as a result of the construction of the associated infrastructure (e.g., access tracks, substations) and direct (settings) impact as a result of the permanent operational development. Those assets scoped in for direct (settings) impacts are detailed in **Table 7.1**.

Due to associated features of scheduled monuments extending outwith their scheduling, assets of potential national importance which may have unidentified extents, and overall high potential of unrecorded remains, we would recommend a 20m buffer be placed around non-designated assets for avoidance of direct (physical) impacts.

Relevant mitigation measures will be embedded within the design of the proposed Development as design progresses. Potential mitigation is discussed in **Section 7.4** of this Scoping Report.

If there are any further ground-breaking works undertaken during operation or decommissioning 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, such as a watching brief or design changes to proposed infrastructure may be required.

7.2.2 Potential Sources of Impact outwith the Site Boundary

Setting impacts are the most likely source of impact to heritage assets outwith the site boundary, particularly as part of the operational phase of development, and will be considered as part of the EIA Report. Designated assets considered for potential significant effects - Scheduled Monuments, Category A Listed Buildings, Conservation Areas, and GDLs within 10km and Conservation Areas and Category B Listed Buildings within 5 km - along with the ZTV indicating their visibility of the proposed turbines, are depicted on **Figure 7.1**.

To provide a preliminary list of assets that will be subject to a detailed assessment, all assets that were considered for assessment have been subject to an appraisal found in **Appendix A**. This appendix has aimed to create a proportionate scope for the assessment and will be an evolving document throughout the EIA process. A search for assets outside the initial 10 km study area, particularly those that have long distance views have been considered. None with these criteria were identified to be scoped in for further assessment.

Assets that fall out of the proposed study area, the ZTV, and that do not have a third viewpoint that contributes to the significance of the monument, have been scoped out of assessment. Assets that have been scoped in may be scoped out and vice versa, dependent on the final layout of the Proposed Development.

As a result of this exercise, there are five designated cultural heritage assets within 10 km of the proposed turbine locations that will be subject to detailed settings assessment within the EIA, as there is the potential for the proposed development to have a significant effect upon them. Two designated cultural heritage assets – Crooked Stone, standing stone (SM4238) and Crookedstane, platform settlement (SM4647) are within the Site boundary.



The assets scoped in for further assessment within the EIA process, after the initial heritage appraisal, are compiled in **Table 7.1** and shown on **Figure 7.1** and **Figure 7.2**.

Table 7.1 Heritage Assets Scoped In

Heritage asset	Designation	Approx. distance to nearest turbine (km)
Heritage Assets within the Site Boundary		
Crookedstane, platform settlement 200m E of (SM4647)	Scheduled Monument	0.5
Wintercleugh, bastle house 1000m S of Tomont Hill (SM5279)	Scheduled Monument	0.5
Heritage Assets outwith the Site Boundary		
Crooked Stone, standing stone 160m N of Crookedstane (SM4238)	Scheduled Monument	0.7
Glenochar Burn, bastle house, post-medieval settlement & field system (SM5385)	Scheduled Monument	1.9
Smithwood, bastle house 900m SW of Daerside (SM5647)	Scheduled Monument	1.9

7.3 Proposed Visualisations

Table 7.2 lists the proposed visualisations to be prepared during the EIA stage.

Table 7.2 List of Proposed Visualisations

V'point Number	Designation	Visualisation Coordinates	Visualisation Type	Visualisation Details
CH1	Crookedstane, platform settlement 200m E of (SM4647)	296864, 615152	Photomontage	From high point of asset towards proposed turbines
CH2	Wintercleugh, bastle house 1000m S of Tomont Hill (SM5279)	298063, 611483	Photomontage	From bastle house ruins towards nearest proposed turbines and Smithwood bastle house (SM5647)



V'point Number	Designation	Visualisation Coordinates	Visualisation Type	Visualisation Details
CH3	Crooked Stone, standing stone 160m N of Crookedstane (SM4238)	296591, 615333	Wireline	From high point of asset towards proposed turbines
CH4	Glenochar Burn, bastle house, post-medieval settlement & field system (SM5385)	294406, 613944	Photomontage	From bastle house ruins overlooking enclosed fields towards nearest proposed turbines.
CH5	Smithwood, bastle house 900m SW of Daerside (SM5647)	295858, 609174	Photomontage	From bastle house ruins towards nearest proposed turbines.

This report is accompanied by wirelines (**Figure 7.2**) which show the scoping layout from the following assets:

- Crookedstane, platform settlement 200m E of (SM4647)
- Wintercleugh, bastle house 1000m S of Tomont Hill (SM5279)
- Crooked Stone, standing stone 160m N of Crookedstane (SM4238)
- Glenochar Burn, bastle house, post-medieval settlement & field system (SM5385)
- Smithwood, bastle house 900m SW of Daerside (SM5647)

7.4 Approach to Mitigation

There are multiple methods of mitigation that may be employed to reduce the potential for impact as a result of the Proposed Development.

Suitable measures for minimising impacts through ground disturbance might include:

- The micro-siting 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 might include:

- Alteration of the proposed turbine layout; and/or
- Reduction of proposed turbine heights.



These mitigation measures will be embedded into the design of the proposed Development and developed through careful consultation with the relevant statutory consultees.

7.5 Assessment Methodology

7.5.1 Study Area

For purposes of this assessment, a study area (**Figure 7.1**) has been defined by both the limits of a ZTV, scale of the proposed development, and professional judgement. It has been determined that 10 km from the locations of the proposed turbines is sufficient. The sources identified within **Table 7.3** will be consulted to inform the assessment, however, this list is not exhaustive.

Table 7.3 Sources to be Consulted

Subject	Author Summary	Source
Designated cultural heritage assets (except conservation areas)	The database of Historic Environment Scotland (HES)	HES digital data download
Conservation Areas	South Lanarkshire, D&GC, Scottish Borders, and HES	HES digital data download
Non-designated cultural heritage assets including non-inventory designated landscapes	Data held for South Lanarkshire by WoSAS and Trove	Digital data purchased from WoSAS as download
Historic Mapping	National Library of Scotland	National Library of Scotland website
Historic Environment Information	Trove online database curated by Historic Environment Scotland	Canmore online database
Previous archaeological investigations	Unpublished reports, Archaeology Data Service	Various
LiDAR	Scottish Government	Scottish Remote Sensing Portal
Aerial Photography	HES	HES database Trove and National Collection of Aerial Photography (NCAP) (online)
Historic Land Use Assessment	HES	HES digital data download

7.5.2 Scope

7.5.2.1 Assets within the Site

Designated and non-designated assets within the Site will be looked at in order to determine any direct (physical or setting) or indirect impacts. Should WoSAS identify any non-designated



assets that they consider to be of national/regional significance, and which they consider derive cultural significance from their settings, these should be made known to the Applicant via consultation. Nationally significant designated assets within the Site will be subject to setting assessment as below.

7.5.2.2 Assets outwith the Site

All nationally significant designated assets within the aforementioned 10 km Study Area will be subject to an initial setting assessment in order to determine any potential for impacts (**Appendix A**).

7.5.2.3 Field Surveys

A targeted Site inspection will be carried out in relation to all recorded assets within the Site boundary of the proposed development; the aim of this would be to establish the condition of any recorded assets and identify the potential for any additional presently unrecorded assets.

Asset mapping would also be compared with ZTV and satellite imagery in order to identify designated heritage assets for which the proposed development might cause impacts in relation change of an asset's setting. This would be followed by a detailed analysis of those sites identified as potentially sensitive to such impacts, including a targeted field inspection.

7.5.3 Assessment and Types of Impacts

The Proposed Development has the potential to result in impacts upon the significance of heritage assets where it changes their baseline condition and/or their setting.

In accordance with the EIA Regulations, the assessment will identify any development 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 proposal. Such impacts are most likely to occur during the construction phase and are most likely to be permanent.
- Indirect (physical) impacts occur where the fabric of an asset, or buried archaeological remains, is removed or damaged, or where it is preserved or conserved, as an indirect result of the proposal, such as increased pollution or changes in water draining patterns which can indirectly affect the preservation of heritage materials. Such impacts are most likely to occur during the construction phase and are most likely to be permanent.
- Direct (setting) impacts result from the proposal 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 proposal in the surroundings of the asset. Direct (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 proposal's lifespan and may be permanent, reversible, or temporary. These impacts are assessed with reference to Managing Change in the Historic Environment: Setting (HES 2020) and the EIA guidance set out by NatureScot and HES (2018).



Assessment will be undertaken separately for direct (physical) impacts, direct (setting) impacts, and indirect impacts. Direct impacts upon the significance of heritage assets will take into account the level of their cultural significance and the magnitude (extent) of the identified impacts.

7.5.4 Zone of Theoretical Visibility

The setting assessments will be assisted by a ZTV calculation, presented in **Figure 7.1** and **Figure 7.2**. ZTV calculation maps 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 (two metres above ground level). The ZTV models presented in **Figure 7.1** is based upon the maximum level of theoretical visibility, i.e. the maximum height of the turbine blade tips.

Based on the results of the baseline study, constraint mapping will be generated using GIS software to show mapped heritage assets in relation to a ZTV. This will filter out those assets that do not require further assessment. It will also be used to identify and agree on the most potentially sensitive assets; these may then require computer-generated visualisations to be produced as part of their assessment, in liaison with consultees.

7.5.5 Cultural Heritage Significance

The categories of cultural heritage significance to be referred to are presented in **Table 7.4**, 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 cultural significance categories take into account factors such as: designation, status and grading as defined in HES's Designation Policy and Selection Guidance (2019). 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 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 local HER and Trove 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 taken into account where appropriate.

Table 7.4 Cultural Heritage Significance

Cultural Significance	Example
Highest	World Heritage Sites (including nominated sites); and Heritage assets of acknowledged international importance.
High	Scheduled Monuments (including proposed sites); Listed Buildings (Category A and B); Battlefields included within the inventory; Marine Protected Areas; Gardens and Designed Landscapes; Conservation areas containing nationally important buildings; Non-designated heritage assets of scheduled quality and importance; and Heritage assets of national importance.



Cultural Significance	Example
Medium	Listed Buildings (Category C); Conservation areas containing buildings that contribute significantly to its historic character; and Heritage assets of regional importance.
Low	Heritage assets of local importance; Heritage assets compromised by poor preservation and/or poor survival of contextual associations; and Buildings of modest quality in their fabric or historical association.
Negligible	Heritage assets with very little or no surviving archaeological interest; and Artefact find spots (where the artefacts are no longer in situ and where their provenance is uncertain).

7.5.6 Sensitivity of Setting

In addition to identifying the cultural significance of a heritage asset, it is essential, where changes to setting are being assessed, to understand the contribution that setting makes towards the cultural significance of an asset. Elements of setting may make a positive, neutral, or negative contribution to the cultural significance of an asset. Thus, in determining the nature and level of impact upon an asset and their setting by the development, the contribution that setting makes to an asset's cultural 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 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 highest cultural 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 cultural significance also has a bearing on the sensitivity of that asset to changes to its setting.

While certain cultural heritage assets of high or highest cultural heritage significance are likely to be sensitive to direct 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 cultural significance. HES' 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*" (HES, 2020). Assets with very high or high relative sensitivity to setting impacts may be vulnerable to any changes that impact 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 to changes to their setting is lower may be able to accommodate greater changes to their settings without key characteristics being eroded.

The key criteria used for establishing an assets relative sensitivity to changes to its setting is detailed in **Table 7.5**. This table has been developed based on SLR's professional judgement



and experience of assessing setting impacts. It has been developed in line with relevant policy and guidance throughout this chapter.

Table 7.5 Sensitivity of Setting

Relative Sensitivity	Explanatory Criteria
Very High	An asset, the setting of which is crucial to an understanding, appreciation and experience of it, should be regarded as having very high sensitivity to changes to its setting. This is particularly relevant where setting, or elements of, make a crucial and essential direct contribution to significance.
High	An asset, the setting of which is major to an understanding, appreciation and experience of it, should be regarded as having high sensitivity to changes to its setting. This is particularly relevant where setting, or elements of, contribute substantially to the asset's cultural significance.
Medium	An asset, the setting of which makes a moderate contribution to the understanding, appreciation and experience of it, should be regarded as having medium sensitivity to changes to its setting. This could be an asset for which setting makes a contribution to significance but whereby its value is derived equally from its other characteristics.
Low	An asset, the setting of which makes some contribution to the understanding, appreciation and experience of it, should be regarded as having low sensitivity to changes to its setting. This could be an asset where its significance is derived mainly from other characteristics.
Negligible	An asset where setting makes a minimal contribution to the understanding, appreciation and experience of the asset and it should be thought of having a negligible sensitivity to changes to its setting.

The determination of an assets 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 7.4**, 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.

Magnitude of Change

Determining the magnitude of any likely impacts includes consideration of the nature of the activities proposed during the construction and operational phases of the proposed Development.

Changes could potentially include ground disturbance and changes to setting. The latter might include visual change, as well as noise, vibration, smell, dust, traffic movements etc. Effects may be beneficial or adverse, and may be short-term, long-term or permanent.

Where adverse effects on cultural heritage assets are possible, the magnitude of change can be reduced through measures to prevent, reduce and/or, where possible, offset these effects.



Refer to **Section 7.5** for information on mitigation measures that may be considered suitable, if required.

Taking into account all embedded mitigation measures, the magnitude of change will be assessed using professional judgment, with reference to the criteria set out in **Table 7.6**.

Table 7.6 Magnitude of Change

Magnitude Of Change	Explanatory Criteria
High Beneficial	Changes to the elements of the fabric or the setting of the cultural heritage asset that contribute to its cultural significance, such that this cultural significance, or the ability to understand, appreciate and experience the asset, is considerably enhanced.
Medium Beneficial	Changes to the elements of the fabric or the setting of the cultural heritage asset that contribute to its cultural significance, such that this cultural significance, or the ability to understand, appreciate and experience the asset, is enhanced to a clearly discernible extent.
Low Beneficial	Changes to the elements of the fabric or the setting of the cultural heritage asset that contribute to its cultural significance, such that this cultural significance, or the ability to understand, appreciate and experience the asset, is enhanced to a minor extent.
Very Low Beneficial	Changes to the elements of the fabric or the setting of the cultural heritage asset that contribute to its cultural significance, such that this cultural significance, or the ability to understand, appreciate and experience the asset, is enhanced to a very minor extent.
Neutral/None	The Proposed Development would not impact the cultural heritage significance of the heritage asset, or the ability to understand, appreciate and experience it.
Very Low Adverse	Changes to the elements of the fabric or the setting of the cultural heritage asset that contribute to its cultural significance, such that this cultural significance, or the ability to understand, appreciate and experience the asset, is eroded to a very minor extent. This level of impact would not be considered to affect the integrity of the asset's setting.
Low Adverse	Changes to the elements of the fabric or the setting of the cultural heritage asset that contribute to its cultural significance, such that this cultural significance, or the ability to understand, appreciate and experience the asset, is eroded to a minor extent. This level of impact would rarely be considered to affect the integrity of the asset's setting.
Medium Adverse	Changes to the elements of the fabric or the setting of the cultural heritage asset that contribute to its cultural significance, such that this cultural significance, or the ability to understand, appreciate and experience the asset, is eroded to a clearly discernible extent. This level of impact might be considered to affect the integrity of the asset's setting.
High Adverse	Changes to the elements of the fabric or the setting of the cultural heritage asset that contribute to its cultural significance, such that this cultural significance, or the ability to understand, appreciate and



	experience the asset, would be considerably eroded. This level of impact would probably be considered to affect the integrity of the asset's setting.
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Table 7.7 provides a matrix that relates the cultural heritage significance of the asset to the magnitude of change on its significance, to produce an overall anticipated level of effect.

Table 7.7 Significance of Effect

Magnitude of Change (Beneficial or Adverse)	Cultural Significance (Excluding Unknown)				
	Highest	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor	Very Minor
Medium	Major	Moderate	Minor	Very Minor	Very Minor
Low	Moderate	Minor	Very Minor	Very Minor	Negligible
Very low	Minor	Very Minor	Very Minor	Negligible	Negligible
Neutral/None	None	None	None	None	None

7.5.7 Significance

Once the anticipated effects of the proposed development upon cultural heritage assets are defined, professional judgment 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 7.7**.

- any effects identified as 'Major' would most likely be 'Significant';
- any effects identified as 'Moderate' might also be considered 'Significant', though professional judgment may determine otherwise on the basis of the associated site-/asset-specific detail such as sensitivity of setting; and
- any effects identified as 'Minor' or less are unlikely to be considered 'Significant', though again, professional judgment will be exercised.

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

7.5.8 Integrity

NPF4 indicates 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 significant effects are found, a detailed assessment of adverse impacts upon the integrity of the setting will be 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.

A significant impact upon the integrity of the setting of an asset will only occur where the degree of change that will be represented by the proposed development would adversely alter those factors of the monument's setting that contribute to cultural significance such that the understanding, appreciation and experience of an asset are not adequately retained. This is most likely to occur where the sensitivity of setting as set out in **Table 7.5** is High or Very High.

7.5.9 Residual Effects

Residual effects are those that remain even after the implementation of suitable mitigation measures. Residual effects will be identified, and the level of those residual effects defined with reference to **Table 7.6** and **Table 7.7**.

7.5.10 Cumulative Effects

A cumulative effect occurs when there is a combination of:

- an impact on an asset or group of assets due to changes resulting from the development subject of assessment; and
- an impact on the same asset or group of assets resulting from other development (consented or proposed) within the surrounding landscape.

Consideration of other developments will be limited to:

- wind farm planning applications, within 10 km, that have been submitted and have a decision pending;
- solar farm planning applications, within 2 km, that have been submitted and have a decision pending;
- wind farm planning applications, within 10 km, that have been granted permission but not yet constructed; and
- solar farm planning applications, within 2 km, that have been granted permission but not yet constructed.

Any effect resulting from operational wind farms (within 10 km of the Proposed Development) will be considered as part of the baseline impact assessment. Cumulative impact will be considered in two stages:

- assessment of the combined impact of the developments, including the proposed development; and
- assessment of the extent to which the proposed development contributes to the combined impact.

7.6 Consultation

Consultation will be undertaken with HES in relation to the method of assessment employed in assessing those heritage assets within their remit; these include Scheduled Monuments, Category A Listed Buildings, GDLs, and Inventoried Battlefields. WoSAS will be consulted in relation to the local HER which includes non-designated heritage assets and designated heritage assets of regional significance, and any non-designated assets they consider to be of higher significance.



7.7 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 proposed that 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 EIA Handbook (NatureScot, 2018), Category C Listed Buildings are of local rather than national or regional importance, unless in the opinion of an assessor the designation should be higher.

Category B Listed Buildings within 10 km of the proposed turbines have been scoped out of any further assessment, with the exception of those wherein specific views are considered to contribute to their significance and/or to the ability to understand, appreciate and experience them. At this stage, no Category B Listed Buildings were identified to match this criteria, and as such, all Category B Listed Buildings are scoped out.

The significance of a Conservation Area derives from its local heritage and the assets that it contains, rather than the wider landscape. As such, assessment of effects on Conservation Areas has been scoped out, with the justification that, even if visibility between the Proposed Development and the Conservation Areas may occur, the Conservation Areas' significance would not be diminished.

It is also proposed that any assets that fall outwith the ZTV (and where 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.

7.7.1 Decommissioning

Any change arising from decommissioning activities will be scoped out as it is assumed that no ground-breaking works would be required, and as such, the overall impacts would be lower than during the construction phase. If ground-breaking works occur, mitigation measures may need to be implemented and would be agreed with key stakeholders at that time via a Decommissioning Environmental Management Plan (DEMP).

7.8 Questions to Consultees

The following are questions to consultees:

- Q7.1 - Do consultees agree with the proposed scope of the assessment, including the proposed study area?
- Q7.2 - Do consultees agree with the proposed assessment methodology?
- Q7.3 - Are consultees satisfied with the mitigation measures proposed?
- Q7.4 - Are consultees satisfied with the locations and types of visualisations proposed?
- Q7.5 - Are the consultees satisfied with matters scoped out?



8.0 Geology, Geohydrology, Hydrology & Peat

8.1 Introduction

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

8.2 Baseline Description

8.2.1 Site Setting

The Proposed Development is located in an area of agricultural land, open moorland and forestry. Elevations across the Site range from approximately 560 m above Ordnance Datum (m AOD) in the south-east to 270 m AOD in the north-west, with five main hills and valleys present from south to north across the Site.

Scottish Environment Protection Agency (SEPA) rainfall data¹ indicates that the local area received an annual rainfall total of 1,709 mm in 2024.

8.2.2 Designated Sites

A review of NatureScot's SiteLink² indicates that there are no geological, hydrological or geohydrological designated sites within 1 km of the Site.

8.2.3 Geology and Hydrogeology

The Site is shown by British Geological Survey (BGS) mapping³ to be underlain by three bedrock geologies: sandstone, mudstone, siltstone and conglomerate of the Queensberry Formation to the south, metasandstone and metamudstone of the Mindork Formation in the centre of the Site, and wacke of Shinnel Formation to the north.

No superficial deposits are recorded across higher elevations of the Site. The superficial geology, where present along valleys and watercourses, is shown by BGS mapping to comprise diamicton (unsorted sediment with gravel in a fine mud matrix) and alluvium (variable sediment of mud, sand and gravel with some peat in places). Isolated pockets of peat superficial deposits are recorded throughout the middle of the Site.

The superficial deposits beneath the Site are unlikely to contain significant amounts of groundwater, any perched groundwater is likely to be in hydraulic continuity with watercourses. The bedrock has been classified by BGS as a 'low productivity aquifer', whereby small amounts of groundwater may be found in near surface weathered zones and secondary fractures, with flow occurring through fractures and other discontinuities.

All of Scotland's groundwater bodies have been designated as Drinking Water Protected Areas (DWPA) under the Water Environment (Drinking Water Protected Area) (Scotland)

¹ Scottish Environment Protection Agency, Rainfall Data: Garls Craig. Available online at <https://www2.sepa.org.uk/rainfall/data/index/301168> [Accessed March 2025].

² NatureScot, SiteLink. Available at: <https://sitelink.nature.scot/map>. [Accessed: March 2025].

³ British Geological Survey, Onshore Geoindex. Available online at <https://mapapps2.bgs.ac.uk/geoindex/home.html> [Accessed March 2025]



Order 2013 and require protection for their current use or future potential use as drinking water resources.

Leadhills is the underlying groundwater body (SEPA ID: 150667), which covers an area of 397 km² and is currently classified as “Poor” overall status⁴.

8.2.4 Soils and Peat

The National Soil Map of Scotland⁵ indicates that the soils beneath the Site generally comprise peaty gleyed podzols and noncalcareous gleys with peaty gleys, with land adjacent to the River Clyde shown to be underlain by mineral alluvial soils with peaty alluvial soils. Small areas towards the centre of the Site are shown to be underlain by dystrophic blanket peat with peaty gleys and brown earths.

Peatland classification mapping⁶ indicates that the noncalcareous gleys and mineral alluvial soils are mineral soils (Class 0), which is not considered to represent peatland habitats. The dystrophic blanket peat is classified as Class 5, whereby no peatland habitat is recorded but soils are carbon-rich. The peaty gleyed podzols are mainly classified as Class 3; predominantly peaty soil with some peat soil but where the dominant vegetation cover is not priority peatland habitat. Isolated areas of Class 1 peatlands are recorded within the Site which represent nationally important carbon-rich soils.

A Phase 1 peat depth survey was undertaken by SLR Consulting in March 2025 for the Proposed Development. The data collected has been interpolated to show probe depth across the site, as shown in **Figure 8.1**. Of the probes recorded, 86.6% of probe depths were <0.5 m. There are small, isolated areas of deep peat present, with only 2.7% of probe depths recording >1.0 m. The deepest probe reached a depth of 2 m in the south-west of the Site. Overall, the results of probing show the average depth across the site to be 0.27 m, with 97.3% of probe depth <1.0 m, which is not classified as deep peat.

8.2.5 Local Hydrology

The Site is located within the River Clyde catchment, with land immediately to the south-east of the Site falling within the catchment of the River Annan.

Daer Reservoir is located approximately 200 m to the south of the Site and is designated as a Drinking Water Protected Area (Protected Area ID: 100313). The catchment of Daer Reservoir extends to the southern boundary of the Site.

Daer Reservoir outfalls to Daer Water which drains in a northerly direction approximately 200 m to the west of the Site. Towards the centre of the Site, adjacent to the western boundary, Daer Water converges with Portrail Water, forming the River Clyde.

Several smaller watercourses drain from east to west across the Site, all of which are tributaries of Daer Water or the River Clyde.

The following surface watercourses and waterbodies are monitored by SEPA under the WFD:

⁴ Scottish Environment Protection Agency, Water Classification Hub. Available online at <https://informatics.sepa.org.uk/WaterClassificationHub/> [Accessed March 2025]

⁵ The James Hutton Institute, National Soil Map of Scotland. Available at: <https://soils.environment.gov.scot/maps/soil-maps/national-soil-map-of-scotland/> [Accessed: March 2025].

⁶ NatureScot, Carbon and peatland 2016 map. Available at: https://map.environment.gov.scot/Soil_maps/?layer=10 [Accessed: March 2025].



- Daer Reservoir (waterbody ID: 100313) which has a current (2023) overall classification of 'good ecological potential';
- Daer Water (waterbody ID: 10043) which has a current (2023) overall classification of 'moderate ecological potential';
- Portrail Water (waterbody ID: 10120) which has a current (2023) overall classification of 'good'; and
- River Clyde (waterbody ID: 10042) which has a current (2023) overall classification of 'moderate ecological potential'.

8.2.5.1 Flood Risk and Drainage

SEPA river flood mapping indicates that land along the western boundary of the Site forms the floodplain of Daer Water and the River Clyde. Land adjacent to Hapturnell Burn and Wintercleuch Burn to the south of the Site and land adjacent to Clydes Burn to the north of the Site is also at risk of river flooding both now and in the future. Several surface water flow paths are shown to drain across the Site from east to west, generally following mapped watercourses within existing valleys. Minor overland surface water flow paths are indicated across the Site, draining towards the main stems of existing watercourses.

8.3 Embedded Mitigation

The Proposed Development will undergo design iterations and evolution in response to constraints identified as part of the baseline studies and field studies, to avoid and/or minimise potential effects on receptors where possible.

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

- A buffer of 50 m will be applied to watercourses shown on 1:25,000 scale mapping within areas of proposed windfarm development;
- A minimum buffer of 20 m will be applied to watercourses shown on 1:25,000 scale mapping within areas of proposed solar and BESS development;
- Impacts on public and private water supply sources/distribution networks and areas of GWDTE will be avoided;
- Site-specific peat probing has been undertaken which has established limited areas of deep peat deposits at the Site. Micro-siting of the Proposed Development will avoid areas of deep peat (> 1 m) where possible;
- Where not possible to avoid deep peat deposits, additional targeted peat probing will be undertaken in accordance with current best practice guidance. Should potential for impacts to peatland be identified, a peat management plan (PMP) and peat landslide hazard risk assessment (PLHRA) will be prepared
 - A site-specific PLHRA will be required where preliminary evaluation identifies areas of potential increased peat slide risk. Such areas will be avoided through design of the Proposed Development and where unavoidable mitigation measures to manage these risks will be outlined in the PLHRA; and
 - The PCA and PMP will show how the integrity of carbon-rich soils and peat will be safeguarded through appropriate design.



Best practice guidance has been developed to assist developers minimise the risks associated with wind farm construction and operation, and 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.

8.4 Assessment Methodology

The potential effects from the Proposed Development on geology, 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 Study Area

The hydrological and hydrogeological study area will extend to 500 m from the Site boundary. The study area for geology, peat, and soils will be within the Site boundary. The cumulative effects study area will extend to 5 km from the Site boundary.

8.4.2 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 available peat probing data, NVC data, 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, soils, and hydrological environment.

8.4.3 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 the information collected in support of the previous planning application and during the desk and baseline study;
- Identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;
- Visit any identified potential GWDTE (in consultation with the project ecologists);
- Obtain private water supply information from SLC and visit any private water supplies within the study area that could potentially be affected by the Proposed Development to confirm details of the location of the abstraction, its type and use, as required;
- Prepare a schedule of potential watercourse crossings (where required);



- Assess the site geomorphology and conduct additional targeted peat depth probing where required; and
- Inspect rock exposures and establish, by probing, an estimate of overburden thicknesses (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 assessment for inclusion in the EIA Report will be prepared to identify the potential effects on geology, hydrogeology, hydrology, and peat, as a result of the construction, operation, and decommissioning of the Proposed Development.

8.4.4 Assessment of Effects

Having regard to the nature of the Proposed Development and key baseline characteristics, at this early stage it is considered that the assessment would include:

- The micro-siting of turbines, solar PV arrays, BESS units, 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 and other hydrological features;
- Assessment of potential effects on soils and peat;
- Likely effects of the Proposed Development on the hydrological regime, including water quality, water flow and drainage;
- In consultation with the project geologists and ecologists, assessment of potential effects on water (including groundwater) dependant habitats, including peat habitat and GWDTE, if confirmed; and
- Suitable mitigation measures to prevent significant hydrological and hydrogeological effects;
- 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 and hydrological environment; and
- Assessment of potential flood risk and drainage impacts during construction and operation, including any proposed watercourse crossings.

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

- Peat Landslide Hazard and Risk Assessment (PLHRA), where required;
- Peat Condition Assessment (PCA) and Peat Management Plan (PMP), where required;
- Carbon Balance Assessment, where required;
- Level 1 Flood Risk Assessment & Drainage Impact Assessment;
- Schedule of Watercourse Crossings;
- Private Water Supply and Drinking Water Protected Area Risk Assessment;



- GWDTE Risk Assessment, where required; and
- Outline Borrow Pit Appraisal.

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.

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 impacts will each be considered through a set of pre-defined criteria.

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

A review of other existing, consented and proposed developments near the Proposed Development will be undertaken and potential impacts on hydrology, hydrogeology and geology will be assessed to identify cumulative impacts. With regard to the Proposed Development, it is likely that mitigation measures will be proposed that will have a neutral effect or provide betterment compared to baseline conditions. It is considered unlikely that there will be any significant residual or cumulative impacts to report.

8.4.5 Peat Landslide Hazard Risk Assessment (PLHRA)

If development is proposed on areas of peatland, where slopes exceed 2°, 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 can be identified.

8.4.6 Peatland Condition Assessment

If development is proposed on areas of peatland, a targeted field assessment will be completed alongside a Desk Study to characterise and classify peatland conditions across the Site. The peatland condition assessment will provide a baseline condition assessment that can be used to demonstrate that peat avoidance and impact mitigation is at the core of the Proposed Development design.

This includes:

- Vegetation, distribution of key indicator species (plant functional type) are commonly used to evidence condition, although NVC classes give an approximate distribution, a more detailed analysis should allow class boundaries to be refined and in the case of the modified class subsumed within the more degraded peatland classification, for example the absence of significant amounts sphagnum species or the presence of large areas of dry heath vegetation;
- Hydrology and peat surface conditions (erosion features, peat density, surface moisture). Peat in poor condition is often denser and drier than that in poor condition, this is difficult to ascertain from satellite imagery and therefore provides an additional evidence base for degradation. Also, smaller scale erosion features/bare peat patches may extend further than visible on imagery;



- Current impacts of land management, such as evidence of burning, grazing, and tracks which are too small to be seen remotely to support the condition assessment; and
- Ground validation and extensive baseline from which post restoration progress and can be benchmarked against and also decisions regarding siting justified against.

This will generate data on key condition indicators including:

- Ecological;
- Plant functional Type (Cover, Community structure);
- Peatland microforms;
- Grazing indicators (Heather Height etc.);
- Hydrological;
- Hydrological features (Drains, peat pipes, gulleys, natural drainage);
- Surface wetness;
- Fire evidence (surface charring);
- Geomorphology;
- Peat Stability/Mechanical;
- Surface Density (quaking, soft, firm);
- Failure features (slumping, desiccation cracks, strain cracks);
- Land use; and
- Any additional land-use data not determined in desk study.

8.4.7 Peat Management Plan (PMP)

Results from the Phase 1 peat survey will be used to confirm the extents of carbon rich soils and peat within the Proposed Development area, to inform site design and minimise impacts on carbon rich soils and peat.

If avoidance of peat and carbon rich soils cannot be avoided and development on peat and/or carbon rich soils is required, 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) and NatureScot Good Practice Guidance on Wind Farm Construction. 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 application 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:

- A detailed description of the in-situ peat characteristics at the application site and the expected nature and classification (in accordance with von Post Classification or similar) of excavated peat;
- Details of the construction activities that are likely to generate peat;
- Peat depths within the Site will be presented using a 100 m grid where access is possible and a 10 m grid at proposed infrastructure locations (the probing will also provide information of the substrate below the peat);
- 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, solar PV arrays, BESS units, 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.

As a minimum, the following sources of information will be referenced, and the relevant data utilised in developing the PMP:

- Relevant chapters of the EIA Report (including general principles of peat management);
- Site survey data (topographical, peat probing and coring survey data);
- Site layout and other design drawings (cut and floated track layout etc);
- Borrow pit/engineering geology assessment report;
- Ecological assessment (National Vegetation Classification (NVC) maps to determine vegetation type and condition, von Post field observations, erosion state, etc.); and
- Hydrological assessment, such as information on peat hydrological controls (e.g., grips, forestry drainage, peat pipes, hags and gullies, erosion state, etc).

8.4.8 Carbon Balance Assessment

A Carbon Balance Assessment will be undertaken to assess the potential CO₂ savings that can be made, based on assessing the electricity generation mix that the Proposed Development is displacing at any given time, and the carbon released due the construction of the Proposed Development. The assessment would involve the following steps:

- Data gathering (assessment phase: input required from relevant disciplines to provide details on infrastructure dimensions, construction methods, peat depth, habitat loss etc.);
- Data input into the Scottish Government online Carbon Calculator (incorporating the data collected into the carbon balance assessment);
- Online Carbon Calculator input including an online submission of results.



The following guidance and assumptions are utilised by the Scottish Government online Carbon Calculator expected carbon savings are calculated via the Scottish Government online Carbon Calculator, which has been developed incorporating the methods described in the following guidance:

- Calculating potential carbon losses and savings from wind farm on Scottish peatlands, Technical Note – v2.10.0. Scottish Government. 2016); and
- Smith et al. 2011. Carbon implications of windfarms located on peatlands – update of the Scottish Government Carbon Calculator tool.

8.4.9 Flood Risk Assessment & Drainage Impact Assessment

A combined Level 1 Flood Risk Assessment (FRA) and Drainage Impact Assessment (DIA) report will be prepared as a supporting technical appendix to the EIA report. The following works would be completed:

- Request flooding information from SEPA and South Lanarkshire Council;
- Review SEPA flood maps;
- Obtain hydrogeological information from the BGS;
- Determine ground conditions using published BGS geology mapping;
- Undertake a Level 1 screening Flood Risk Assessment to comprise a qualitative checklist assessment of flood risk from all sources of flooding;
- Advise on flood risk design constraints which could have implications for the layout of Proposed Development;
- Provide an outline drainage management plan for the wind and solar elements of the Proposed Development, outlining sustainable drainage principles and features which can be implemented during the construction and operation of the Proposed Development to protect the water environment;
- Provide a conceptual surface water drainage strategy for the BESS elements of the Proposed Development, outlining appropriate sustainable drainage systems (SuDS) required to suitably manage surface water quality and quantity; and
- Consideration will be given to the management of fire water and runoff from hard standing areas of the BESS.

8.4.10 Schedule of Watercourse Crossings

A Schedule of Watercourse Crossings will be prepared as a supporting technical appendix to the EIA report. The following works would be completed:

- Collect photographs and dimensions of watercourses where permanent watercourse crossings are proposed associated with access tracks;
- Present collected information and location for each proposed watercourse crossing point;
- Detail the likely form of track crossing solution; and
- Indicate the requirement for CAR application, where applicable.



8.4.11 Private Water Supply and Drinking Water Protected Area Risk Assessment

A Private Water Supply (PWS) Risk Assessment will be prepared as part of the EIA report. The following works would be completed:

- Obtain details of private and licensed water abstractions from South Lanarkshire Council and SEPA, presented on mapping and tabulated;
- Obtain details of Drinking Water Protected Areas from Scottish Water and SEPA;
- Verify the location of the private and public water supply sources as part of the hydrological site survey;
- Assess the presence of a complete source-pathway-receptor linkage and potential impacts; and
- Outline potential mitigation and monitoring recommendations for any at risk private or public water supply sources.

8.4.12 Groundwater Dependent Terrestrial Ecosystem Assessment

A Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment will be prepared as part of the EIA report. The following works would be completed:

- Review NVC mapping, verified by the project ecologists to screen for potential GWDTE habitat using SEPA guidance⁷.
- Assess areas of potential GWDTE using desk materials and from visual observations collected on site. We have assumed no water sampling or intrusive ground investigation is required to complete the GWDTE assessment.

8.4.13 Outline Borrow Pit Appraisal

The identification and assessment of potential borrow pit locations will initially comprise a review of all relevant historical and geological maps, soil survey maps and aerial photographs together with any available borehole records held by the British Geological Survey. This information will be used in combination with elevation data for the Site to identify preferred borrow pit sites based on topographic gradients and anticipated geology.

This document will incorporate an engineering geological assessment of those locations identified as potentially viable borrow pits to supply sufficient quality and quantity of materials for the construction of the proposed development.

The report will include:

- Justification for each proposed location;
- Area assessed for suitability for development of the borrow pit (“area of search”) for which the various environmental assessments will be undertaken;
- Estimated dimensions of the borrow pit to be developed within the “area of search”;
- Estimated volumes of overburden to be removed;

⁷ SEPA (2024) Guidance on Assessing the Impacts of Development of Groundwater Dependent Terrestrial Ecosystems.



- Description of geology;
- Anticipated method of working / extraction;
- Proposals for restoration / reinstatement of borrow pit;
- Individual figures for each borrow pit showing:
 - The area of search and proposed dimensions in plan view on an OS background map;
 - An indicative cross-section of the proposed borrow pit with original and restored ground profile; and
 - A colour photograph of the proposed location, annotated with indicative borrow pit layout.

8.5 Additional Mitigation

Should the assessment of effects identify potential significant effects, additional mitigation measures will be presented in the EIA report to suitably manage potential effects on the ground and water environment. An assessment of residual effects will then be undertaken.

8.6 Potential Impacts

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

8.6.1 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;
- Ground instability (inc. peat slide risk if present);
- Impacts on surface water and groundwater quality from pollution from fuel, oil, concrete or other hazardous substances;
- Discharge of sediment-laden runoff to drainage system and watercourses;
- Increased flood risk to areas downstream of the Site during construction through increased surface runoff and construction activities within mapped floodplains;
- 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 watercourse crossings;
- Potential adverse impacts to public and private water supplies; and



- Disturbance and or pollution resulting from borrow pit formation and use.

8.6.2 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 and the BESS units;
- Changes in flood extents and flood depths upstream and downstream of river and floodplain crossings;
- 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 and or fire water suppression within the BESS compound.

8.7 Receptors and Impacts Scoped in or out of Assessment

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:

- Effects on geology. While there will be effects arising from 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.
- Effects on designated sites as there are no designated sites within 1 km of the Site, nor are there are designated sites downstream or downslope of the Site. It is therefore considered that there are no designated sites which could be impacted by the Proposed Development.
- A Geomorphological Assessment, as photographs and records of key existing or baseline water features would be recorded and presented in the assessment.
- Detailed Flood Risk Assessment. Published mapping confirms the Proposed Development is not located in an area at risk of fluvial, coastal or significant surface water flooding. It is proposed, therefore, that a simple screening of the potential sources of flooding (fluvial, coastal, groundwater, pluvial, infrastructure etc.) is presented with the EIA Report and measures that would be used to manage flood risk, and control the rate and quality of runoff will be specified in the EIA Report. In accordance with SEPA Technical Flood Risk Guidance and Good Practice Guidance for river crossings, a detailed flood risk assessment of the access tracks and watercourse crossings which cross mapped floodplains will be undertaken at the detailed design stage of the project and would be secured by a pre-development planning condition. The assessment will establish accurate baseline flood extents and flood depths and provide suitable parameters for the design of the access road and



the crossing to ensure that they are capable of passing the 200-year plus climate change peak flow without adversely impacting peak flood extents and flood depths upstream or downstream of the crossing. The results of the detailed flood risk assessment will be included in the final CEMP, at the detailed design stage. If any land raising is proposed within the floodplain, appropriate flood compensation will be incorporated within the detailed design of the access tracks and agreed with statutory consultees prior to construction.

- Detailed Drainage Design. A description of the design standards and appropriate sustainable drainage measures which would be used to control and manage incident rainfall would be specified in the DIA Report. The engineering design of the site drainage would be prepared as part of the detailed site design (post planning) and would form part of the final Construction and Environmental Management Plan. This would be submitted to SEPA for approval at that stage and would be secured by a pre-development planning condition.
- Water Quality Monitoring as part of the baseline assessment. Classification data is available from SEPA for the watercourses at Site and there are no known sources of potential water pollution at the Site that might give rise for the need for water quality monitoring.
- Detailed borrow pit designs. A Borrow Pit Site Management Plan of pollution prevention measures 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.

8.8 Scoping Questions to Consultees

The following are questions to consultees:

- Q8.1 - Published mapping confirms that parts of the Site are at risk of flooding from rivers and smaller watercourses, the Proposed Development is located on land not identified as being at flood risk. It is proposed, therefore, that a simple screening of potential flooding sources (fluvial, coastal, pluvial, groundwater etc.) is presented in the EIA Report. For river crossings and/or supporting infrastructure within the mapped floodplain, a detailed flood risk assessment will be undertaken at the detailed design stage of the project and included in the final CEMP. This would be secured by a pre-development planning condition. 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. Again, is this acceptable?
- Q8.3 - Site investigations, including additional targeted peat probing, augering and condition assessment, private water supply survey, and GWDTE assessment will be undertaken, where required, as part of the proposed assessment. Should any additional investigation or data sources be considered when assessing baseline conditions?
- Q8.4 - It is not proposed to undertake any water quality sampling, 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 Transport and Access

9.1 Introduction

This Section covers the predicted transport and access issues that may arise from the construction of the Proposed Development, the significance of these effects and what suitable mitigation can be put in place to avoid, minimise or offset adverse effects.

The Transport and Access EIA Report Chapter will be supported by a Transport Assessment (TA) report, Abnormal Load Route Survey and technical figures.

The key issues for consideration as part of the assessment will include:

- The temporary change in traffic flows and the resultant, temporary effects on the study's road network during the construction phase;
- The physical mitigation associated with the delivery of abnormal loads;
- The design of new access infrastructure; and
- The consideration of appropriate and practical mitigation measures to avoid, minimise or offset temporary effects.

The potential effects of these will be examined in detail.

9.2 Baseline Description

The traffic, transport and access study area will be defined by the preferred abnormal load and general construction traffic routes to the site.

The exact locations for the proposed site access junction (for construction and abnormal load traffic) have yet to be finalised, however it is likely to be located on the A702 and will be a priority junction, designed to accommodate all predicted traffic movements.

General construction traffic will likely access the site from the surrounding area using the A702, B7076 and A74(M). Abnormal load traffic will likely access the site from the A74(M) and A702.

The initial proposed study area would cover the A74(M) between Beattock and Abington, the B7076 between Junction 14 and Beattock and the A702 between Junction 14 and to the south of Watermeetings.

All road links within the study area would be considered, along with active travel routes and core path routes directly affected by construction traffic movements.

Traffic data for the local road network will be obtained from UK Government Department for Transport (DfT) traffic count data, the Traffic Scotland database or from specifically commissioned traffic surveys. National Road Traffic Forecast (NRTF) Low Traffic Growth assumptions will be used to provide a common future year baseline to coincide with the expected construction traffic peak.

New Automatic Traffic Count (ATC) surveys will be located undertaken once the access strategy has been confirmed.

Traffic accident data will be obtained from Crashmap UK for the study network to inform the accident review for the immediate road study area. Five years worth of data will be collated for roads within the study area.



9.3 Embedded Mitigation

Standard mitigation measures that are likely to be included in the assessment are:

- Basic road direction and warning signage;
- The design of suitable access arrangements with full consideration given to the road safety of all road users;
- A Staff Sustainable Access Plan; and
- A Framework Abnormal Load Transport Management Plan.

9.4 Assessment Methodology

The Environmental Assessment of Traffic and Movement (IEMA, 2023) sets out a methodology for assessing potentially significant environmental effects. In accordance with this guidance, the scope of assessment will focus on:

- Potential impacts (of changes in traffic flows) on local roads and the users of those roads; and
- Potential impacts (of changes in traffic flows) on land uses and environmental resources fronting these roads, including the relevant occupiers and users.

The main transport impacts will be associated with the movement of general HGV traffic travelling to and from the site during the construction phase of the development.

The following rules taken from the guidance would be used as a screening process to define the scale and extent of the assessment:

- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
- Rule 2: Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

Increases below these thresholds are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level predicted as a consequence of the Proposed Development will therefore be assumed to result in no discernible environmental impact and as such no further consideration will be given to the associated environment effects.

The estimated traffic generation of the Proposed Development will be compared with baseline traffic flows, obtained from new and existing traffic survey data, in order to determine the percentage increase in traffic.

Potentially significant environmental effects will then be assessed where the thresholds as defined above are exceeded. Suitable mitigation measures will be proposed, where appropriate.

A cumulative assessment will take place where a scheme has planning consent and would have a significant impact on the study network (i.e. over 10% increase in traffic flows). These traffic flows would be included into the baseline flows used within the assessment.

Planning proposals that are in scoping but do not have planning consent are not committed development and as such would not be included in the assessment.



It is not anticipated that a formal TA will be required as these are not generally considered necessary for temporary construction works. Instead, a reduced scope TA would be provided, focussing on construction activities and their impact on the study area links. This will include a Route Survey Report for Abnormal Indivisible Loads (AIL).

Detailed swept path analysis will be undertaken for the main constraint points on the route from the port of entry (likely to be King George V Docks, Glasgow) through to the site access junction to demonstrate that the turbine components can be delivered to site and to identify any temporary road works which may be necessary.

Each turbine is likely to require between 11 and 13 abnormal loads to deliver the components to site. The components will be delivered on extendable trailers which will then be retracted to the size of a standard HGV for the return journey.

9.5 Additional Mitigation

Additional mitigation will be included should the assessment reveal criteria that are significant following the application of standard mitigation measures.

Site specific mitigation, based upon experience of other schemes in the surrounding area, will include:

- Production of a site-specific Construction Traffic Management Plan;
- Section 96 Agreement of the Roads (Scotland) Act to protect the public road against abnormal wear and tear in the study area;
- Design of the Site access junction to ensure that approved access routes are adhered to; and
- Enhanced temporary construction warning and direction signage.
 - Details of these measures will be detailed in the Transport Assessment.

9.6 Potential Impacts

Potential effects arising from the construction of the Proposed Development on road users and residents along the delivery route may include the following:

- Severance
- Driver Delay
- Pedestrian Delay
- Non-motorised User Amenity
- Fear & Intimidation; and
- Road Safety

The effects to be considered in the assessment will be based upon percentage increases in traffic flow and reviewed against the impacts noted above.

The effects on receptors identified within the study area will be reviewed for the construction phase, with a peak construction period assessment undertaken. This will include a review of the maximum potential impact and therefore it is considered to provide a robust assessment of the effects of construction traffic on the local and trunk road networks.



9.7 Receptors and Impacts Scoped in or out of Assessment

Once operational, it is envisaged that the level of traffic associated with the Proposed Development would be minimal. Regular monthly or weekly visits would be made to the wind farm for maintenance checks. The vehicles used for these visits are likely to be 4x4 vehicles and there may also be the occasional need for an HGV to access the wind farm for specific maintenance and/or repairs. It is considered that the effects of operational traffic would be negligible and therefore no detailed assessment of the operational phase of the development is proposed.

The traffic generation levels associated with the decommissioning phase will be less than those associated with the development phase as some elements such as access roads would be left in place on the site. As such, the construction phase is considered the worst-case assessment to review the impact on the study area. An assessment of the decommissioning phase would therefore not be undertaken, although a commitment to reviewing the impact of this phase would be made immediately prior to decommissioning works proceeding.

9.8 Scoping Questions to Consultees

The following are questions to consultees:

- Q9.1 – Stakeholders and consultees are asked to confirm their acceptance of the proposed Transport and Access study area, data collection methodology and assessment methodology?
- Q9.2 - Stakeholders and consultees are asked to confirm any cumulative development considerations?



10.0 Noise

10.1 Introduction

This Section considers the potentially significant effects of noise during the Site preparation and construction, operation, and decommissioning phases of the Proposed Development which will require further consideration within the EIA Report.

This Scoping Section sets out the key issues identified and proposes a method and standards for assessment of noise in the EIA Report.

Consultation with DGC and SLC Environmental Health Officers (EHOs) will continue throughout the assessment process regarding the following:

- the status of identified potential Noise Sensitive Receptors (NSRs);
- noise monitoring positions for the baseline survey;
- identification of potentially cumulative developments and a detailed method for the consideration of potential cumulative effects; and
- the derivation of appropriate ETSU noise limits, with apportionment for cumulative developments if appropriate.

We assume that SLC and DGC EHOs will work together during the consultation process to avoid duplication of communications.

10.2 Baseline Description

A review of maps and aerial images has identified that the Site and surroundings comprises a mixture of farmland, forestry and moorland, with the A74(M) motorway to the north and east. The surrounding area has been subject to extensive wind farm development, with proposed, consented and operational developments noted to the north, east and south.

Based on our review of the available information and knowledge of the area we anticipate that the baseline noise environment will be dominated by the wind, wildlife and livestock, with wind turbine noise a significant contributor close to existing wind farms and road traffic noise a significant contributor in the northern part of the study area.

10.3 Assessment Methodology

10.3.1 Construction

Potential impacts from construction noise and, where appropriate, vibration, will be assessed at the closest identified NSRs. Predictions of noise will be based on the likely site preparation and construction methods and programme. Where appropriate, the assessment of construction noise will also consider off-site activities such as construction traffic and deliveries, where the necessary information is available. Construction noise can be effectively controlled by employing appropriate best-practice methods and limiting hours of work at sites close to Noise Sensitive Receptors (NSRs).

10.3.2 Operation

We will consult directly with the DGC and SLC EHOs to agree the detailed method of assessment for each aspect of the project, however the general approach is outlined below.



10.3.2.1 Wind turbine noise

The identity of the closest NSRs will be agreed and any financial involvement established. Any relevant wind energy schemes that should be included in the cumulative assessment, whether in planning, consented or operational, will also be identified and agreed. Potentially cumulative wind turbine developments will be excluded on the basis of a 10 dB difference in noise emissions at relevant NSRs, where this can be demonstrated through prediction.

A baseline noise survey will be undertaken in accordance with the IoA GPG for NSRs where the baseline noise environment does not include wind turbine noise. Wind speed measurements will be collected, likely by a remote-sensing SoDAR or LiDAR device, and standardised to 10 m in accordance with the method provided in the IoA GPG. Micro-siting of the baseline survey locations will seek to exclude influence from non-representative noise sources such as plant, boiler flues, heat pumps, vegetation and any existing wind turbines. A record of the installation of monitoring locations will be provided to the EHOs for review following the commissioning visit.

Daytime and night-time operational overall noise limits will be derived from measured background noise levels at the closest identified NSRs across the range of critical wind speeds (typically 4 – 12 m/s) in accordance with ETSU-R-97 and any specific requirements of DGC and SLC. Records of the baseline data analysis will be provided to the EHOs, identifying periods of rainfall excluded from the analysis and any other treatments of the data.

Given the extensive wind farm development to the north and east of the Site, we anticipate that it will not be possible to measure background noise levels in the absence of wind turbine noise at NSRs in these areas and to the south. Background noise levels at such NSRs will therefore be established in consultation with EHOs. The basis for such agreement will be reported background noise levels measured during baseline measurement campaigns for cumulative developments.

Analysis of predicted noise levels at NSRs affected by cumulative developments will be undertaken to identify controlling properties, in accordance with the methods provided in the IoA GPG. Apportionment of overall noise limits will be undertaken to determine residual noise limits specific to the proposed development, taking account of available headroom. This process will be agreed through consultation with EHOs at each stage. With reference to **Section 2.3**, it will be considered that the Clyde Wind Farm Phase 1 will be fully decommissioned prior to operation of the Proposed Development. Clyde Wind Farm Phase 1 will not, therefore, be considered as a cumulative development.

Derived noise limits will be applied at NSRs using monitoring locations as proxies. The approach to allocating proxy data to NSRs will be agreed with the EHOs.

A candidate turbine will be selected for the Proposed Development, the verified noise emission details of which will be reproduced in the EIA Report chapter (A-weighted and octave band data) for critical wind speeds.

Noise levels will be predicted within CadnaA noise modelling software, in accordance with the ISO9613 method and the IoA GPG requirements. Corrections for concave topography and line-of-sight visibility will be applied to predicted noise levels in accordance with the IoA GPG, where applicable.

Corrections for directivity may be applied within the cumulative assessment in accordance with the guidance set out in the IoA GPG where NSRs lie between two developments and where simultaneous down-wind predictions are therefore overly conservative.



Predicted levels will be evaluated against agreed noise limits and the magnitude of impact and significance of effect determined accordingly. All residential NSRs will be assumed to be of high sensitivity. The sensitivity of any other types of receptors identified will be agreed with the EHOs.

10.3.3 Other noise sources

Noise from ancillary electrical equipment will be evaluated in accordance with BS4142. Background noise levels will be characterised using data collected during the wind farm baseline monitoring campaign, supplemented by additional attended measurements where appropriate.

10.4 Additional Mitigation

We anticipate that key controls for construction noise such as core hours of works would be exerted through the requirements of the EHOs and that such controls would constitute effective mitigation measures.

Site-specific mitigation measures will be outlined to reflect the principles of Best Practicable Means, as set out in the Control of Pollution Act (CoPA) 1974. The purpose of these measures will be to reduce construction noise and, where relevant, vibration impacts insofar as is reasonably practicable.

Where predicted operational noise levels exceed the proposed noise limits at any wind speed, outline mitigation strategies will be proposed. Mitigation of operational noise, if required, may include an alternative selection of turbine, operating certain turbines in low noise modes under certain meteorological conditions, such as specific wind speeds and directions, or recommendations to move or eliminate turbines from the scheme.

10.5 Potential Impacts

The Proposed Development will introduce new noise sources into the area, both during the construction and operational phases. Significant adverse impacts can be prevented by restricting noise levels due to the Proposed Development to within noise limits determined in accordance with appropriate guidance, as detailed above.

10.6 Receptors and Impacts Scoped in or out of Assessment

No NSRs have yet been scoped out of the assessment, however, the status of potential NSRs will be confirmed during site visits and through consultation with the EHOs. Where properties are determined to be derelict and uninhabitable, they may be scoped out of further assessment.

Should any blasting be required for borrow pits, it is unlikely that the charge parameters will be known at the time of the assessment. We therefore propose to scope out detailed assessment of potential vibration impacts and instead commit to meeting appropriate vibration limits at NSRs should blasting be required. We anticipate that such a commitment could be agreed through an appropriate planning condition.

10.7 Scoping Questions to Consultees

The following are questions to consultees:

- Q10.1 – Do you agree with the proposed methodology set out above?



- Q10.2 – Do you agree with the proposal to scope out the following from further assessment:
 - operational traffic noise;
 - operational vibration;
 - construction noise; and
 - decommissioning.



11.0 Aviation

11.1 Introduction

The Proposed Development has the potential to cause adverse effects on aviation during turbine operation. These include (but are not limited to): physical obstructions, the generation of unwanted returns on Primary Surveillance Radar (PSR) and adverse effects on the overall performance of Communications, Navigation and Surveillance (CNS) equipment. A full aviation assessment of the Proposed Development has been undertaken to identify and assess the likely aviation issues associated with the Proposed Development.

It is proposed that potential effects on aviation will be reported in a technical appendix to the EIA Report.

11.2 General Approach to Assessment

The aviation baseline, and study area, assessment has been determined by, and is dependent on, the maximum operating ranges of each of the radar systems scoped into the assessment. The operational range of the radar system is dependent on the function of the radar, the operational requirement of the radar and on the type of radar used. The ranges of those radars and, subsequently, the topic-specific study area will vary depending on the technical specification of each radar system and, possibly, between different installations of the same system. The same factors apply to other aviation infrastructure (radios/beacons). Civil Aviation Authority (CAA) Publication (CAP) 764 provides criteria for initial guidance in assessing whether any wind turbine development might have an impact on civil aerodrome related operations.

Within the extent guidance the study area and consultation criteria for aviation stakeholders is defined below for civil and military infrastructure. These distances inform the size of the assessment area and include:

- Airfield with a surveillance radar – 30 km
- Non-radar licensed aerodrome with a runway of more than 1,100 metres – 17 km
- Non-radar licensed aerodrome with a runway of less than 1,100 metres – 5 km
- Licensed aerodromes where the turbines would lie within airspace coincidental with any published Instrument Flight Procedure (IFP)
- Unlicensed aerodromes with runways of more than 800 metres – 4 km
- Unlicensed aerodromes with runways of less than 800 metres – 3 km
- Gliding sites – 10 km
- Other aviation activity such as parachute sites and microlight sites within 3 km – in such instances developers are referred to appropriate organisations.

CAP 764 goes on to state that these distances are for guidance purposes only and do not represent ranges beyond which all wind turbine developments will be approved or within which they will always be objected to. These ranges are intended as a prompt for further discussion between developers and aviation stakeholders and will be reported upon in the EIA.

It is necessary to take into account the aviation and air defence activities of the Ministry of Defence (MoD) as safeguarded by the Defence Infrastructure Organisation (DIO). The types of issues that will be addressed in the EIA include:



- Ministry of Defence Airfields, both radar and non-radar equipped;
- Ministry of Defence remote Air Traffic Control radars;
- Ministry of Defence Air Defence Radars;
- Ministry of Defence Meteorological Radars; and
- Military Low Flying.

It is also necessary to take into account the possible effects of wind turbines upon the National Air Traffic Services (NATS) En Route Ltd (NERL) communications, navigation and surveillance systems – a network of primary and secondary radars and navigation facilities around the country.

11.3 Baseline Description

The Proposed Development is located in an area of Class G, uncontrolled, airspace but is in an area in which flying can be subjected to restrictions to enable military flying training to take place. It is also underneath the controlled airspace of the Scottish Terminal Manoeuvring Area (TMA); the nearest civil radar equipped airport is at Glasgow Prestwick, approximately 61 km to the west, and the nearest military airfield is at Spadeadam, approximately 67 km to the south-east. Eskdalemuir seismic recording station is approximately 29 km south-east.

11.4 Assessment Methodology

The assessment of potential effects has been undertaken by identifying whether impacts on aviation and radar are anticipated and has used bespoke radar modelling software and an extensive database of aviation infrastructure.

Radar modelling has been undertaken using specialist propagation prediction software (RView) which has been designed and refined specifically for the task. RView uses a comprehensive systems database which incorporates the safeguarding criteria for a wide range of radar and radio navigation systems and models terrain using the Ordnance Survey (OS) Landform Panorama digital terrain model, which has a post spacing of 50 metres and has a root mean square (RMS) error of 3 metres. The results are verified using the Shuttle Radar Topography Mission (SRTM) dataset, a separate smoothed digital terrain model with data spacing of 3 arc seconds. By using two separate and independently generated digital terrain models, anomalies are identified and consistent results assured. RView models the refractive effects of the atmosphere on radio waves and the First Fresnel Zone. RView can perform calculations using the true Earth Radius at the midpoint between the radar and the wind turbine or the simplified 4/3 Earth Radius model.

11.5 Additional Mitigation

There is a well-established procedure for the dissemination of information relating to construction/decommissioning and considered essential for the safety of flying operations, both civil and military, to allow such aviation operations to be planned and to continue accordingly. The construction/decommissioning activities, when conducted in accordance with mandated procedure, will not pose a risk to aviation and there should be no effect; the inherent embedded mitigation means that construction and decommissioning activities can be scoped out from further consideration with aviation.



11.6 Potential Impacts

All of the potential aviation implications and effects have been identified and will not affect the scope of the EIA, but will be the subject of consultation and will be reported within a technical appendix to the EIA Report.

The aviation assessment does not determine the significance or non-significance of any possible effect. There is no standard series of definitions for significance of effects within aviation and Air Navigation Service Providers (ANSPs) set and apply their own significance criteria. The extent of any effect is, therefore, a matter for the stakeholder to determine and the aviation chapter will not, therefore, adhere to the standard EIA methodology.

It can be assumed that the turbines within the Proposed Development will be visible to the NATS radar at Lowther Hill.

It can be assumed that the turbines within the Proposed Development will be visible to the NATS Transmitter and Receiver sites at Lowther Hill.

It can be assumed that the final layout will require a lighting assessment to be approved by the CAA given the anticipated tip height, and the MoD as the Proposed Development is within a Low Flying Area.

Although not an aviation issue the Site is within the consultation distance for the array at Eskdalemuir; it will be necessary to confirm that the noise budget will be capable of accepting the Proposed Development.

11.7 Receptors and Impacts Scoped in or out of Assessment

There are potential Line of Sight implications for the NATS Lowther Hill radar. This will be confirmed, along with the nature of the operational effects and possible mitigation, through consultation with NATS and will be reported within the Aviation technical appendix.

There are potential Line of Sight implications for some the Spadeadam ATC and threat radars, although unlikely. This will be confirmed, along with the nature of any operational effects, through consultation with DIO and will be reported within the EIA Report.

DIO will need to be consulted regarding any likely low flying implications, and this will be reported within the Aviation technical appendix.

There should be no MoD Air Defence Radars (ADRs) likely to be affected by the Proposed Development. This will be confirmed with DIO during consultation and reported in the Aviation technical appendix.

Construction - Algorithms within radar systems are established to prevent static objects being detected and to ensure that only moving objects are presented to the controllers' screens. During the construction phase the blades will be static and will not be detected. There should be no interference with radar systems.

There is a well-established procedure for the dissemination of information relating to construction and considered essential for the safety of flying operations, both civil and military, to allow such aviation operations to be planned and to continue accordingly. The construction activities, when conducted in accordance with mandated procedure, will not pose a risk to aviation and there should be no effect; the inherent embedded mitigation means that construction activities will not be further considered.

De-commissioning - There is a well-established procedure for the dissemination of information relating to de-construction and considered essential for the safety of flying operations, both



civil and military, to allow such aviation operations to be planned and to continue accordingly. The decommissioning activities, when conducted in accordance with mandated procedure, will not pose a risk to aviation and there should be no effect; the inherent embedded mitigation means that de-construction activities will not be further considered.

There are no non-radar equipped licensed aerodromes within the recommended consultation distance, and these can be scoped out from further consideration.

There are no unlicensed aerodromes, hang-gliding sites or glider sites within the stipulated consultation distances and these will not be further considered.

11.8 Scoping Questions to Consultees

The following are questions to consultees:

- Q11.1- Is the extent of envisaged scoping considered appropriate?
- Q11.2 - Is there any other aviation stakeholder that could/should be consulted?
- Q11.3 – Do you agree that aviation can be scoped out of EIA with potential effects provided in a technical appendix to the EIA Report?



12.0 Forestry

12.1 Introduction

This section sets out the proposed approach to the assessment of potential effects upon forestry and woodland during the construction, operation and decommissioning of the Proposed Development.

A standalone Forestry Report as a technical appendix to the EIA Report is proposed.

12.2 Baseline Description

There are a number of small woodland areas within the Site. Most are coniferous plantations, but some native woodlands are also present.

37.97 ha of the woodlands are under the Rural Developments Contracts (RDC) while a further 55.64 ha are shown within the National Forest Inventory (NFI) datasets.

The Native Woodland Inventory of Scotland (NWSS) dataset shows 6.2 ha of wet woodland and 0.57 ha of upland birchwood.

No Ancient Woodland is recorded within the Ancient Woodland Inventory (AWI) dataset.

12.3 Embedded Mitigation

The technical appendix will identify the embedded mitigation required through the Scottish Government's Control of Woodland Removal Policy (CoWRP) and the area of compensatory planting.

The CoWRP Implementation guidance will be followed and any compensatory planting will follow The UK Forestry Standards, the UK Governments' Approach to Sustainable Forestry 5th Edition (2023).

12.4 Assessment Methodology

Forestry data will be sought from the owners or agents to identify the planting years and species within the Site. A Site survey will also be undertaken to confirm data and determine the likelihood of windblow should felling for the Proposed Development take place.

If required, felling prior to construction of the Proposed Development shall be to accommodate ancillary infrastructure, potentially including access tracks, the substation and the BESS which will be mainly determined by environmental offset requirements.

The technical appendix will describe the felling for the Proposed Development in terms of "permanent felling" which will not be replanted throughout the construction and operational phases and "temporary felling" required to avoid predictable windblow and which may be replanted in situ. Temporary felling may also result from the requirements of temporary infrastructure such as temporary compounds.

The UKFS will be followed for any forest operations required by the Proposed Development.

The technical appendix will provide tables and figures showing the baseline species and age classes and baseline felling and replanting proposals (where these exist). Permanent and temporary felling will be described in text, tables and figures.

The integration of the Proposed Development into a Wind Farm Forest Plan will be a key part of the design process. A wind farm felling plan will be prepared setting out the forestry felling



and management requirements, including any replanting associated with the construction and operation of the Proposed Development.

The technical appendix will clearly identify woodland loss and the requirement for compensatory planting. The Applicant is committed to meeting this mitigation.

12.5 Additional Mitigation

No additional mitigation is proposed for forestry.

12.6 Potential Impacts

The sensitive forestry receptors identified are the NWSS native woodlands and the coniferous plantations.

The permanent infrastructure of the Proposed Development, including all tracks, turbine hardstandings with any environmental stand-off requirements, permanent compounds, and any other permanent features will have an impact on the forest structure during the construction and operation periods through the permanent loss of woodland.

Temporary felling may be required where the felling for the infrastructure would render the remainder of the compartment(s) unstable and likely to suffer windthrow. This felling would be to the nearest appropriate wind firm boundary; this additional felled area would then be replanted in situ.

However, with replanting either as compensatory planting or replanting in situ there are no significant effects anticipated.

12.7 Receptors and Impacts Scoped in or out of Assessment

The forestry proposals are interlinked with environmental effects which are outside the scope of the Forestry technical appendix but which should be read in conjunction with the following EIA Report chapters or standalone assessments:

- Landscape and Visual Amenity
- Ecology
- Ornithology
- Cultural Heritage
- Geology, Hydrology, Hydrogeology and Soils
- Traffic, Transport and Access
- Socio-Economics, Tourism and Recreation

12.8 Scoping Questions to Consultees

The following are questions to consultees:

- Q12.1 - Is the proposed assessment adequate for forestry on this Site?
- Q12.2 – Do you agree that forestry can be scoped out of the EIA with a forestry report provided as a technical appendix?



13.0 Socioeconomics and Tourism

13.1 Introduction

BiGGAR Economics has been commissioned to undertake a socio-economic assessment of the Proposed Development. Socio-economic assessments of onshore wind farms over the last decade have found no adverse effects as significant in terms of the EIA Regulations and there is no reason to expect significant effects for the Proposed Development. It is therefore proposed to scope socio-economics out of the EIA.

However, it is recognised that socio-economic and tourism issues will be of interest to stakeholders and local authorities and so a separate report on socio-economics and tourism will be provided and submitted alongside the EIA Report. This will include consideration of local tourism activity, direct effects such as employment generation and any indirect or induced effects from the Proposed Development. The report will also consider whether the Proposed Development maximises net economic benefit, in the context of NPF4 Policy 11(c).

This Section describes what will be considered in the separate socio-economic and tourism report and the approach that will be taken.

13.2 General Approach to Assessment

There is no specific legislation or guidance available on the methods that should be used to assess the socio-economic impacts of the Proposed Development. The proposed method will however be based on established best practice, including that used in UK Government and industry reports on the sector. This assessment will draw from two studies by BiGGAR Economics on the UK onshore wind energy sector, a report published by RenewableUK and the Department for Energy and Climate Change (DECC) in 2012 on the direct and wider economic benefits of the onshore wind sector to the UK economy and a subsequent update to this report published by RenewableUK in 2015, as well as more recent industry data on the onshore wind sector and its supply chain, including evidence from South Lanarkshire.

There is also no formal legislation or guidance on the methods that should be used to assess the effects that wind farm development may have on tourism interests. The proposed method will consider specific attractions or tourism facilities to assess if there could be any effects from the Proposed Development.

Whilst NPF4 includes no requirement to consider tourism when considering net economic impact or in the project design and mitigation process, relevant employment statistics show that in Clydesdale East the employment in the sustainable tourism sector accounts for a higher percentage of total employment in the area (10%) compared to Scotland (9%). This indicates the importance of tourism in the local area surrounding the Proposed Development and it is recognised that local stakeholders may be interested in the potential impact. Therefore, a tourism assessment will be included in the socio-economic report.

13.3 Baseline Description

The study areas of the socio-economic assessment will be selected to meet the interests of key stakeholders and will be made of pre-defined administrative geographies. As such the socio-economic impact assessment will focus on the following study areas:

- South Lanarkshire;
- Scotland; and



- the UK.

The socio-economic baseline description will also include information for the electoral ward of the Site, Clydesdale East.

For the tourism assessment, the study area will be a 15 km radius of the Site boundary, consistent with previous research of the relationship of tourism and onshore wind developments.

The baseline assessment will include a description of the current socio-economic, recreation and tourism baseline within the relevant study areas as noted above.

The population of South Lanarkshire was 330,280 in 2023 (6% of the Scottish total and 0.5% of the UK total), of which 64% were working age, similar to the average for Scotland and the UK. Between 2023 and 2043, the total population is projected to decrease by 1%, compared to a 2% and 6% increase in Scotland and the UK, respectively⁸.

The proportion of the population that is economically active is lower in South Lanarkshire (77.2%), compared to Scotland (77.3%) and the UK (78.4%), while the unemployment rate is 2.0% compared to 3.5% in Scotland and 3.8% in the UK as a whole⁹.

The main sectors of employment are human, health and social work activities (18% of employment in South Lanarkshire compared to 16% in Scotland and 14% in the UK) and wholesale and retail trade (16% of employment compared to 13% in Scotland and 14% in the UK). The share of employment in construction in South Lanarkshire is 8%, higher than the Scottish and the UK averages (5%)¹⁰.

A smaller proportion of households in South Lanarkshire are anticipated to be fuel poor (about 32%) compared to Scotland as a whole (34%)¹¹. These figures have increased significantly since 2021 due to the increased energy prices.

In Clydesdale East (the electoral ward of the Proposed Development), around 10% of employment is in the sustainable tourism sector, which is higher than the proportion in South Lanarkshire (8%) and Scotland as a whole (9%)¹².

In 2019, there were 3.8 million day visitors in South Lanarkshire (compared to 145 million in Scotland and 1.8 billion in the UK) and 139,000 domestic overnight visitors (compared to 12.4 in Scotland and 121.4 million in the UK). Domestic visitor spend was £102.5 million, 1.3% of the £8.2 billion in Scotland and 0.1% of the £83 billion in the UK as a whole¹³. Data regarding visitor numbers at a local authority level, covering the post-Covid period, is likely to be available at the time of the assessment.

The socio-economic and strategic baseline will be expanded on in the standalone report through a review of publicly available data sources. This will include:

- the population characteristics of the local area, including local and national demographic trends;

⁸ ONS (2024) Population estimates – local authority based on five-year age band – Data for 2023

⁹ ONS (2025) Annual Population Survey – Data for June 2023 – June 2024

¹⁰ ONS (2024) Business Register and Employment Survey Safeguard access – Data for 2023

¹¹ Scottish Government (2025) Scottish House Condition Survey: 2023 Key Findings.

¹² ONS (2024) Business Register and Employment Survey Safeguard access – Data for 2023

¹³ VisitBritain (2022) Great Britain Tourism Survey - Table 2.8 - Local authority destination and purpose



- fuel poverty statistics set within a national context;
- employment and economic activity in the local area within the context of the national economy;
- wage levels in the local area compared to the national levels;
- the industrial structure of the local economy compared to the national level; and
- the role of the tourism sector in the local economy.

13.4 Assessment Methodology

It is anticipated that the contents of the socio-economic assessment chapter will include:

- introduction, including scope of assessment and methodology;
- economic development and tourism strategic context;
- baseline socio-economic context;
- baseline tourism and recreation context;
- proposed measures and actions to maximise local economic and community impacts;
- proposed measures and actions to mitigate any harmful effects (if required);
- socio-economic assessment;
- tourism and recreation impact assessment; and
- summary of findings and conclusion.

This will primarily be a desk-based study with consultation undertaken with the local community to further inform the baseline and inform any opportunities from the Proposed Development which arise therein.

In order to assess the magnitude of socio-economic impacts, the level of activity/ employment supported during the construction and operation phases will be estimated.

Government and industry reports will be used to determine the expected capital and operational expenditure associated with the Proposed Development, as well as the breakdown of expenditure by different contracts (e.g. turbine, balance of plant). An assumption will then be made based on the share of each type of contract that can be secured regionally and nationally. This increase in turnover will then be used to estimate the economic impact associated with the Proposed Development.

The method to assess the socio-economic effects will be based on industry best practice and will consider the share of contracts that can be secured in each study area, and the level of employment that can be supported as a result.

In order to assess effects on tourism and recreation, the features that make the local area distinctive and attractive will be identified and the potential impact of the Proposed Development on those key features will then be assessed.

The assessment will consider the extent to which nearby wind farms may have cumulative socio-economic effects, for example increasing the capacity of the local supply chain or contributing to community development in the area.



13.5 Potential Impacts

As discussed at the start of this section, it is not anticipated that the Proposed Development will result in any significant adverse effects and therefore this section outlines the impacts that will be considered as part of the stand-alone report.

An economic impact analysis will be undertaken using the methodology developed by BiGGAR Economics which has been used to assess over 150 onshore windfarms across the UK. The assessment will consider potential direct and indirect socio-economic impacts of each of the elements of the Proposed Development.

The potential socio-economic effects that will be considered are:

- temporary effects on the identified study areas due to expenditure during the construction phase;
- permanent effects on the identified study areas due to expenditure associated with the on-going operation and maintenance of the Proposed Development;
- permanent effects on the local economy as a result of any additional public expenditure that could be supported by the additional tax revenue that would be generated by the Proposed Development during the operational phase; and
- permanent effects on the local economy that could be supported by any community funding that might be provided by the Applicant during the operational phase.

The link between onshore wind energy developments and the tourism sector is a well-researched subject and the most recent research has found no significant link between the performance of the tourism economy and onshore wind development.

In 2021 this study was updated, and research identified 16 wind farms with a capacity of at least 10 MW that became operational between 2015 and 2019¹⁴. Analysis of trends in tourism employment in the locality of these windfarms (15 km radius) found that 11 of the 16 areas had experienced more growth in tourism employment than for Scotland as a whole. For 13 of the 16 wind farms, trends in tourism employment in the locality had outperformed the local authority in which they were based. This work reflected an update of previous work undertaken by BiGGAR Economics in 2017 that considered 28 windfarms constructed between 2009 and 2015 and the trends in tourism employment in the areas local to these developments¹⁵. The analysis found that there was no relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at the local authority level nor in the areas immediately surrounding wind farms developments.

Nevertheless, the tourism sector is an important contributor to the Scottish economy, including the local area surrounding the Proposed Development (Clydesdale East electoral ward) where the sustainable tourism sector accounts for 10% of the total employment, higher than the relative proportion in South Lanarkshire (8%) and in Scotland (9%).

Therefore, there is merit in considering whether the Proposed Development will have any effect on tourism behaviour and tourism economy. This assessment will consider the potential effects that the development could have on tourism following a more focused approach on impacts related to key tourist attractions and recreation assets.

¹⁴ BiGGAR Economics. (2021). Wind Farms and Tourism Trends in Scotland: Evidence from 44 Wind Farms.

¹⁵ BiGGAR Economics. (2017). Wind Farms and Tourism Trends in Scotland: A Research Report.



13.6 Matters Scoped Out

It is proposed that any substantial, adverse impacts identified as part of the standalone socio-economic, tourism and recreation assessment will be considered as part of the EIA, and all other impacts will be scoped out.

13.7 Approach to Mitigation

Proposed mitigation measures will depend on the findings of the assessment. Proposed measures that will be adopted to enhance the socio-economic impacts include:

- engaging early with the local community and local businesses;
- providing clear information on technical requirements that can allow businesses to prepare; and
- incentivising Tier 1 suppliers to engage with local businesses.

Other measures will be identified as part of the standalone socio-economic and tourism assessment.

13.8 Scoping Questions to Consultees

The following are questions to consultees:

- Q13.1 - Do the consultees agree with the approach of scoping socio-economics out of the EIA and into a standalone report to better address the socio-economics requirements of NPF4?
- Q13.2 - Do the consultees agree that the scope of the proposed socio-economic assessment is appropriate?
- Q13.3 - Are there specific socio-economic effects that should be considered in the standalone report?



14.0 Telecommunications

14.1 Introduction

This Section considers potential issues associated with telecommunications as a result of the Proposed Development during construction, operation and decommissioning phases.

It is proposed that potential effects on telecommunications infrastructure will be considered in a technical appendix to the EIA Report.

14.2 Baseline Description

Five telecommunications fixed link paths are located within the Site boundary (see **Figure 2.2** and **2.3**). Four run east to west across the centre of the site, over White Hill, and connect to the Green Lowther telecommunications station while the fifth is located in the north-west of the Site, running north-east to south-west from the same telecommunications station. Outwith the Site boundary, another telecommunications fixed link path is located ~150 m to the west of Watermeetings.

There are no television transmitters within the Site. The closest television transmitter to the Site is located at Moffat, ~9.2 km to the south-east of the Proposed Development.

14.3 Assessment Methodology

14.3.1 Telecommunications

The acceptability of the Proposed Development, in terms of its effects on telecommunications, will be established through direct consultation with all appropriate consultees within the consenting process, namely Airwave Solutions, Arqiva, Atkins, BT, EE, Joint Radio Company (JRC), Spectrum Licensing and Vodafone.

The proposed turbine locations will be designed and positioned to take into account the minimum separation distance of any identified communication link (noting that, to date, five have been identified within the Site). An assessment will be made as to the significance of potential operational effects and where appropriate, suitable mitigation measures will be discussed.

14.3.2 Television

The Moffat transmitter has switched to digital transmission only. Currently, there is no widely accepted method of determining the potential effects of turbines on digital television reception; however, digital television signals are better at coping with signal reflections and do not suffer from ghosting that may occur with analogue signals.

To date, there are very few cases of turbine interference with digital television reception post-digital switchover. Given the strength of the digital signal in the area and the inherently resilient nature of digital television reception, there is considered to be a low risk of any interference from a wind energy development at this location on domestic television reception.

Due to the low risk of interference with television reception, the requirement to address any reception issues once the Proposed Development is operational could be conditioned in any consent granted. For the above reasons, it is not proposed to carry out a detailed assessment of potential effects on television reception and this topic will therefore be scoped out of further assessment.



14.4 Potential Impacts

If turbines are sited within any prescribed telecommunication buffer zones, there is potential for the Proposed Development, once operational, to have an impact on telecommunications links.

No impacts are anticipated during construction or decommissioning.

14.5 Mitigation

Mitigation of impact on telecommunications links will be by design where possible, i.e., the turbines will be sited outside the minimum separation distance from identified communication link(s). Where this is not possible, any other suitable mitigation measures will be discussed and agreed with link operators

14.6 Receptors and Impacts Scoped in or out of Assessment

Television receptors are unlikely to be impacted during construction, operation or decommissioning. It is therefore proposed to scope out the potential effects on television receptors.

Telecommunication receptors are unlikely to be impacted during construction or decommissioning but may be impacted during operation of the Proposed Development. It is therefore proposed that potential effects of the operational stage of the Proposed Development on telecommunication receptors are provided as a technical appendix to the EIA Report.

14.7 Scoping Questions to Consultees

The following are questions to consultees:

- Q14.1 – Do consultees agree to the above methodology?
- Q14.2 – Do any consultees consider there are telecommunications links or infrastructure which could be adversely affected by the Proposed Development?
- Q14.3 – Do consultees have any comments regarding those receptors which may be subject to significant effects from the Proposed Development?
- Q14.4 – Do consultees agree that telecommunications can be scoped out of EIA with potential effects summarised in a technical appendix to the EIA Report?



15.0 Glint and Glare

15.1 Introduction

As part of the Proposed Development, ground-mounted solar PV modules will be arranged in rows and stand approximately 0.6 - 0.8 m Above Ground Level (AGL) at their minimum point and a maximum height of up to 3.5 m AGL. Land in the east, centre and south of the Site is currently under consideration for solar PV development as part of the design evolution process.

This section of the Scoping Report sets out the proposed approach to assess the potential glint and glare (G&G) effects emanating from the solar component of the Proposed Development.

15.2 Baseline Description

This section focuses exclusively on the solar component of the Proposed Development. Key features influencing glint and glare considerations include:

Road and Train Networks:

- Road near Nunnerie farm; and
- Minor road to Daer Reservoir.

Nearby Properties/Buildings:

- Four residential properties are located within the Site with two located at Crookedstane farm in the north, one at Nunnerie farm and one at Whitehill. A further property, limited to occupancy by forestry workers, is located at Crookedstane Rig;
- Scattered residential properties are located outwith but in close proximity to the Site, primarily along the A702 road and the minor road to Daer Reservoir;
- The nearest settlement to the Site is Elvanfoot, located approximately 1 km north-west of the Site at it's closest point and comprising ~20 residential properties; and
- Daer Water Treatment station and associated buildings are located at a minimum of 250 m from the Site. These are not residential buildings.

Airfields:

- Crawfordjohn Airfield located ~14 km to the west;
- Strathaven Airfield located 46 km to the north;
- Glasgow Prestwick Airport located ~63 km to the north-west; and
- Carlisle Lake District Airport located ~70 km to the south.

Cumulative Solar Developments:

- According to the Renewable Energy Database from the Department for Energy Security and Net Zero (DESNZ), the nearest operational solar development is a 5 MW scheme located north of Carlisle, ~60 km south-east of the Proposed Site at Kingmoor Park.
- There are several solar developments of >1 MW installed capacity currently under "Awaiting Construction" or "Application Submitted" status:



- HY2Go Limited (“Awaiting construction”) – 12 MW installed capacity at around 30 km north (near Douglas).
- Muirhall Energy Limited (“Application Submitted”) – 34 MW installed capacity at around 43 km east (near Hawick).
- M74 West Limited (“Application Submitted”) – 82.5 MW of installed capacity at ~10 km north (near Abington).

15.3 Study Area

The proposed G&G assessment study area will include all ground-based receptors within a 1 km radius of the solar component of the Proposed Development for residential and transportation receptors. The study area ensures that all potential receptors are identified and assessed appropriately.

15.4 Assessment Methodology

The G&G assessment will involve identifying receptors requiring analysis, including land-based (buildings, roads) and air-based (flight paths, control towers) receptors. Following discussions with relevant contacts (e.g., nearby operational airports if applicable), receptor data and PV plant specifics (location, module type, coverage) will be fed into ForgeSolar’s GlareGauge tool, which applies the Solar Glare Hazard Analysis Tool (SGHAT) developed by Sandia National Laboratories. The tool categorises G&G impacts as:

- Green (minimal/negligible) = low potential for after image, reflection occurs with lesser strength;
- Amber/Yellow (moderate) = potential for after image, reflection can occur instantly with some disturbance to vision; and
- Red (severe) = potential for permanent retinal damage, reflection occurs instantly with severe disturbance to vision.

Significant G&G effects depend on impact magnitude, receptor sensitivity, and the duration and timing of reflections. Green G&G is low-impact, comparable to reflections from ordinary windows, while Yellow G&G, similar to glass or metal surfaces, may cause significant effects under extended exposure. Red G&G, if affecting sensitive receptors, would likely require mitigation.

15.5 Additional Mitigation

While PV panels are designed to minimise reflections, additional measures may be proposed based on the assessment findings to address any identified risks. These may include:

- Implementing avoidance buffers during the design of the Proposed Development for key sensitive receptors, where applicable;
- Adjusting panel tilt or orientation to reduce the likelihood of reflections reaching sensitive receptors;
- Installing vegetative screening or barriers to block potential reflections; and
- Engaging with stakeholders, such as road safety authorities or local communities, to address specific concerns proactively.



15.6 Potential Impacts

The potential impacts arising from the Proposed Development on road and train networks and nearby residential properties will be similar, if not less, than the G&G that emanates from many man-made and natural features (waterbodies, house and car windows, snow etc). This is due to the PV modules being designed to absorb as much solar irradiation as possible to maximise power generation. Further, modules are often coated with an anti-reflective coating (ARC) to reduce impacts of G&G.

No risk of glint and glare impacts on airfields or airports has been identified due to their significant distance from the Proposed Development.

Given the significant distance between the Proposed Development and existing solar developments (>60 km), cumulative glint and glare impacts would not occur. This also applies to developments currently awaiting construction or at the application stage.

15.7 Receptors and Impacts Scoped in or out of Assessment

Potential impacts associated with glint and glare have been assessed for relevance during the construction, operation, and decommissioning phases of the Proposed Development. Based on the nature of the Proposed Development and surrounding receptors, the construction and decommissioning phases have been scoped out, as detailed below.

Construction Phase:

It is scoped out due to:

- **Temporary Nature of Activities:** The construction phase will involve the use of temporary materials and equipment, which are not highly reflective or positioned in a manner that would result in glint or glare impacts.
- **Lack of Fixed Reflective Surfaces:** Solar panels, the primary source of potential G&G impacts, are not operational during this phase.

Decommissioning Phase:

It is scoped out due to:

- **Removal of Reflective Surfaces:** The primary reflective surfaces, i.e., the solar panels, will be removed during this phase, eliminating the potential for G&G impacts.
- **Temporary and Managed Activities:** Similar to construction, decommissioning activities are temporary and involve equipment that is unlikely to generate significant glint or glare effects.

Operational Phase:

During the operational phase, the reflective surfaces of the solar panels will be active and have the potential to produce glint and glare through interaction with sunlight. This phase represents the greatest potential for impacts on sensitive receptors, such as nearby transport routes and residential properties. All receptors within 1 km of the solar component will be considered for assessment.

15.8 Scoping Questions to Consultees

The following are questions to consultees:



- Q15.1: Do consultees agree with the extent of the Study Area proposed?
- Q15.2: Are consultees content with the proposed methodology for the G&G?
- Q15.3: Do consultees agree the G&G for the construction and decommissioning phases can be scoped out of the EIA, with the EIA Report chapter providing an assessment of operational effects only?



16.0 Shadow Flicker

16.1 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.

16.2 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.

16.3 Baseline Description

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. There are six properties located within these defined areas.

Shadow flicker only occurs during the operational phase of a wind farm. As there are four residential properties within the shadow flicker study area, potential impacts may occur during operations of the Proposed Development. If potential effects to residential receptors are identified through shadow flicker modelling, standard mitigation measures would be proposed, e.g. curtailment at relevant times of day to ensure that maximum parameters are not exceeded. It is therefore proposed that shadow flicker is scoped out of the EIA, but the results of the modelling exercise and details of any necessary mitigation measures designed to avoid any significant adverse effects would be provided as a technical appendix to the EIA Report.

If required, and based on the findings of the shadow flicker assessment to be included within the technical appendix, the Applicant will implement a shadow flicker protocol during operation to mitigate shadow flicker impacts.

16.4 Scoping Questions to Consultees

The following are questions to consultees:

- Q16.1 – Do you agree with the study area outlined above?
- Q16.1 – 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?



17.0 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 M74.

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 were Scoped Into the EIA).

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

17.1 Scoping Questions to Consultees

The following are questions to consultees:

- Q17.1 – Do consultees agree that air quality and human health can be scoped out of EIA?



18.0 Risk of Major Accidents and/or Disasters

Given the nature of the Proposed Development, and its remote location, 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).

An appropriate outline BESS Fire Safety Strategy will be provided and agreed with SLC prior to installation. This will also be included as part of the Operational Environmental Management Plan (OEMP) for the Proposed Development and will be subject to the final technology chosen. Monitoring equipment including fire detection and fire preventions systems will be installed within the containerised battery units and Site access will be designed to ensure that fire appliances can safely access and egress the Site.

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.

18.1 Scoping Questions to Consultees

The following are questions to consultees:

- Q18.1– Do consultees agree that major accidents and disasters can be scoped out of EIA?



19.0 Eskdalemuir Impact Assessment

19.1 Introduction to Eskdalemuir

The Proposed Development site lies within the 50 km MoD Safeguarding zone for the Eskdalemuir Seismic Array. The detection capabilities of the Eskdalemuir Seismic Array are protected from seismic noise generated by wind turbines using a cumulative 0.336 nm noise budget for all turbines built within 50 km of the array.

A Seismic Impact Limit (SIL) for any new wind turbines has been proposed to maximise the installable wind energy capacity of the Southern Uplands while continuing to protect the detection capabilities of the Eskdalemuir seismic array. A SIL between $0.00836 \text{ nm} \cdot \text{MW}^{-0.5}$ (for a deployment of 1.0 GW) and $0.00528 \text{ nm} \cdot \text{MW}^{-0.5}$ (for a deployment of 2.5 GW) will likely be set for all new wind turbines installed in the Eskdalemuir Consultation Zone.

For the full history and technical background of the Eskdalemuir Seismic Array and developments of policy to support Wind Energy developments in the region, please refer to Section 9 of the full Eskdalemuir Impact Assessment (EKA) calculations report for the Proposed Development, in **Appendix B**.

19.2 Clyde South Calculation Results & Status in the ECZ

Renewco Power have contracted subject matter experts Xi Engineering Consultants (XiEC) to determine the impact of the site on the Eskdalemuir Seismic array. The Proposed Development represents 9 turbines with an average distance to the Eskdalemuir seismic array of ~ 30.2 km. The rated power of each turbine is expected to be within the range of 4.5 to 7.0 MW. In the analysis, a worst-case of the lowest power (4.5 MW) was assumed for all turbines.

Calculations to determine impact of developments in the ECZ include those to determine:

- Total seismic budget requirement for a selection of turbine models
- Results of Seismic Impact Limit (SIL) scenarios for a selection of turbine models

The levels of Seismic Budget required by the Proposed Development have been calculated using the best available science and most up to date data in the public domain. From these calculations conducted by XiEC, it was found that the seismic budget requirement for the Proposed Development ranges between 0.009464 nm and 0.032405 nm, depending on which make of turbine is deployed.

The levels of Seismic Impact Limit have been calculated for all available data and 2023 Refined Phase 4 measurements. According to all analysed models, all 9 turbines at the Proposed Development could be built without exceeding the SIL limit for deployments of 1.0 GW up to 2.0 GW. For the 2.5 GW deployment, all turbines met the SIL limit according to every model except the current MoD algorithm, which will likely be superseded by policy currently being drafted and is unlikely to apply.

With these conditions satisfied, all turbines could be built without mitigation and without breaching any of the SIL limits under consideration by the EWG (1, 1.25, 1.5, 2 & 2.5 GW). The fact that any of the proposed SILs would not be breached is testament to efficient use of any budget and minimal impact on the array.



19.3 Conclusion

It is expected that the Proposed Development will be capable of accommodation within the revised seismic budget and safeguarding policies that are under consideration by the Scottish Government and the MoD.

The analysis shows that the preferred Government and Industry SIL levels of 2-2.5 GW would be met by the turbines at Clyde South, even considering a worst-case lowest rated power of 4.5 MW.

Due to the distance to the array, Clyde South represents an efficient use of seismic budget.

Sections 4 and 5 of **Appendix B** demonstrate the methodology of calculations for the Eskdalemuir Consultation Zone (ECZ), and the calculations as performed for the Proposed Development, including detailed results.

It is proposed that further consideration of the Eskdalemuir Seismic Array can be scoped-out of the EIA.

19.4 Scoping Questions to Consultees

The following are questions to consultees:

- Q19.1 – Do consultees agree that further consideration of the Eskdalemuir Seismic Array can be scoped out of EIA?



20.0 Summary of EIA Scope

This EIA Scoping Report outlines the proposed technical and environmental assessments that will be included within the EIA Report for the Proposed Development. **Table 20.1** Error! Reference source not found.summarises these and indicates the technical topics which have been scoped out of the EIA 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 20.1 Topics Scoped In and Out of EIA

EIA Topic	Scoped In / Out
Landscape & Visual Assessment	Scoped In
Ecology	Scoped In
Ornithology	Scoped In
Cultural Heritage	Scoped In
Geology, Geohydrology, Hydrology & Peat	Scoped In
Transport and Access	Scoped In
Noise	Scoped In
Aviation	Scoped Out (report to be provided as technical appendix to EIA Report)
Forestry	Scoped Out (report to be provided as technical appendix to EIA Report)
Socio-Economics	Scoped Out (separate, standalone report to be provided)
Telecommunications	Scoped Out (report to be provided as technical appendix to EIA Report)
Glint & Glare	Scoped In
Shadow Flicker	Scoped Out (report to be provided as technical appendix to EIA Report)
Air Quality and Human Health	Scoped Out
Risk of Major Accidents and / or Disasters	Scoped Out
Eskdalemuir Impact Assessment	Scoped Out



21.0 Scoping Consultees

During the EIA process, a range of statutory and non-statutory consultees will be contacted to provide valuable input and expertise to the EIA Report. By engaging both statutory and non-statutory consultees, the EIA aims to ensure a comprehensive evaluation of potential environmental impacts and promote an inclusive decision-making process.

21.1.1 Statutory consultees:

- Historic Environment Scotland;
- NatureScot;
- South Lanarkshire Council; and
- SEPA.

21.1.2 Non-statutory consultees:

- British Horse Society Scotland
- BT
- Civil Aviation Authority (CAA)
- Clyde River Foundation
- Community Councils¹⁶ (Crawford, Elvanfoot & Daer)
- Crown Estate Scotland
- Defence Infrastructure Organisation
- Fisheries Management Scotland
- Glasgow Airport
- Glasgow Prestwick Airport
- John Muir Trust
- Joint Radio Company (JRC)
- Mountaineering Scotland
- NATS En Route plc
- National Gas Transmission
- National Grid
- Network Rail
- RSPB Scotland
- Scottish Power Energy Networks (SPEN)

¹⁶ The local Community Council is Crawford, Elvanfoot & Daer which is currently in abeyance. To ensure local communities are made aware of the proposals and public consultations etc contact will be made with the Community Councils invited to the Community Liaison Group (CLG) convened by Renewco Power Limited to structure community engagement for the M74 Cluster of projects being brought forward by subsidiary companies.



- Scottish Fire and Rescue Service
- Scottish Gas Networks (SGN)
- Scottish Water
- ScotWays
- Scottish Wild Land Group
- Scottish Wildlife Trust
- South Strathclyde Scottish Raptor Study Group
- Transport Scotland
- Visit Scotland
- West of Scotland Archaeology Service
- Woodland Trust



22.0 References

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