

EIA Scoping Report

Lairdmannoch Energy Park

Dumfries and Galloway Council

Lairdmannoch Energy Park Ltd

August 2023



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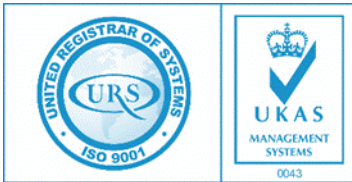
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1 Introduction

1.1 Overview

Lairdmannoch Energy Park Ltd or 'the Applicant' is intending to apply for consent under Section 36 of the Electricity Act (Scotland) 1989 (as amended) to develop an energy park consisting of nine wind turbines (up to 180m tip height), ground mounted solar panels, battery energy storage, access tracks, and associated infrastructure (the 'Proposed Development').

The Proposed Development is made up of two renewable technologies, wind turbines (Wind Development) and solar panels (Solar Development) and these are discussed in individual detail within this report. The Proposed Development will also feature battery storage which will support the integration of low carbon power generated by the two renewable technologies.

The estimated capacity of the Proposed Development is anticipated to be 100MW (comprising 60MW wind, 20MW solar and 20MW battery storage).

The Proposed Development would be located 7km north east of Gatehouse of Fleet and 10km west of Castle Douglas in Dumfries and Galloway (the 'Proposed Development Site') and lies entirely within the planning authority area of Dumfries and Galloway Council (DGC).

The Proposed Development Site location is shown on Figure 1.

The Applicant acknowledges that the Proposed Development should be subject to an Environmental Impact Assessment (EIA) under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations').

Atmos Consulting Limited (Atmos) has prepared this Scoping Report on behalf of the Applicant to accompany a request for a Scoping Opinion under Part 4 the EIA Regulations.

1.2 The Applicant

Lairdmannoch Energy Park is being developed by Lairdmannoch Energy Park Ltd (The Applicant), which forms part of a joint venture between Wind2 and companies managed by Octopus Energy Generation.

The founders of Wind2, together with the Wind2 team, have a substantial track record in the successful development of renewable technologies throughout the UK, being responsible for the delivery of approximately 1 GW of renewable energy through their involvement with RDC Partners and West Coast Energy, sold to ENGIE in 2014.

Wind2 is working on the development of a number of subsidy free renewable energy projects throughout the UK and is committed to investing in Scotland with personnel based in offices in Perth, Edinburgh and the Black Isle.

Octopus Energy Generation are one of Europe's largest investors in renewables, operating £4 billion of green energy generation across seven countries. Octopus Energy Generation operate solar and wind projects across the UK.

The Applicant is committed to investing in Dumfries and Galloway developing renewable energy projects that benefit the community through various funding packages as well as providing both temporary and permanent, local employment.

1.3 Pre-Application Consultation

The Applicant undertook initial engagement with DGC through the Pre-Application Enquiries Service with a request submitted on 26th October 2020 (Ref: 20/04174/PREMAJ). This gave the Applicant an opportunity to:

- Introduce the project;
- Provide an overview of the design considerations to date;
- Discuss ongoing and proposed assessments; and
- Gain an understanding of the key concerns from DGC in order to address those concerns throughout the design and EIA process.

At the time of this consultation the Proposed Development consisted of 12 wind turbines (no solar panels) at 180m tip height plus associated infrastructure.

A pre-application response was received from DGC on 29th January 2021. The relevant sections of this report acknowledges these comments with a view to setting out the process and methodology that will be used to assess the potential for significant environmental effects of the proposals, that will form a future planning application.

Since receipt of the pre application response the design of the Proposed Development has evolved to feature 9 wind turbines at 180m tip height plus associated infrastructure.

The reduction in wind turbine numbers from 12 to 9 is primarily as a result of market changes since the pre application consultation was undertaken in 2020. Wind turbine technology has evolved since this time and the wind turbines proposed as part of the Proposed Development now feature larger rotors requiring larger spacing, resulting in the current design of the Proposed Development.

The reduction in wind turbine numbers aims to reduce the potential for the stacking of wind turbines from key viewpoints, reduce the overall footprint resulting in reduced impacts on potential habitats on site and improves the efficiency of the Proposed Development whilst maintaining the proposed installed capacity.

The Applicant intends to undertake further pre-application consultation with the Scottish Government Energy Consents Unit (ECU), with an initial project notification having been submitted on 2nd June 2023.

1.4 EIA Scoping

The Proposed Development requires consent under Section 36 of the Electricity Act (Scotland) 1989 (as amended), along a direction that planning permission is deemed to be granted (under section 57(2) of the Town and Country Planning (Scotland) Act 1997). An Environmental Impact Assessment (EIA) is required to accompany The Section 36 Application in accordance with section 1 (2a) of The EIA Regulations:

“Subject to Part 12, these Regulations apply in the case of (a)an application under section 36 of the Electricity Act 1989(4) for consent to construct, extend or operate a generating station.”

1.5 Purpose of the Scoping Report

The EIA Scoping Process is intended to provide the consenting authority and key stakeholders the opportunity to raise any issues which they consider may be important to the EIA process and provide direction on the topics on which the EIA Report should focus.

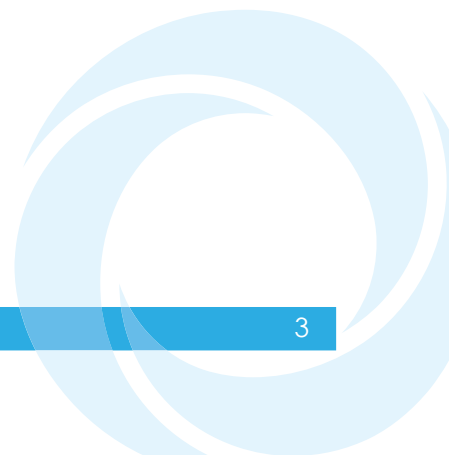
In accordance with Regulation 12 of the EIA Regulations, this report includes the following:

- a description of the location of the development, including a plan sufficient to identify the land;
- a brief description of the nature and purpose of the development and of its likely significant effects on the environment; and
- such other information or representations as the developer may wish to provide or make.

This Scoping Report is set out in the following sections:

- Section 1: Introduction
- Section 2: Description of the Proposed Development;
- Section 3: Approach to the Environmental Impact Assessment;
- Section 4: Summary of relevant planning and energy policy; and
- Section 5: Description of the potential environmental effects and discussion of the baseline situation and the approach to the impact assessment.

At the end of each topic in Section 5 some specific questions are posed in relation to the proposed scope and responses to these questions are particularly welcomed.



2 Project Description

2.1 Proposed Development Site

2.1.1 Location

The Proposed Development Site is centred on National Grid Reference (NGR) NX 66233 62404, located approximately 7km north east of Gatehouse of Fleet and 10km west of Castle Douglas in Dumfries and Galloway. The Proposed Development Site occupies an area of approximately 402ha and is shown bounded by the red line on Figure 1.

2.1.2 Land Use

The land cover within the Proposed Development Site is predominantly upland bog with wet heath, lightly grazed by sheep and cattle.

Wind turbine development in the surrounding area is relatively sparse, with Blackcraig Hill wind farm being the closest operational site at 19km north of the Proposed Development. The operational Plascow turbines are more distant at 22km east of the Proposed Development and there are two consented single turbines at Trostie and High Barcaple, both within 3km of the Proposed Development.

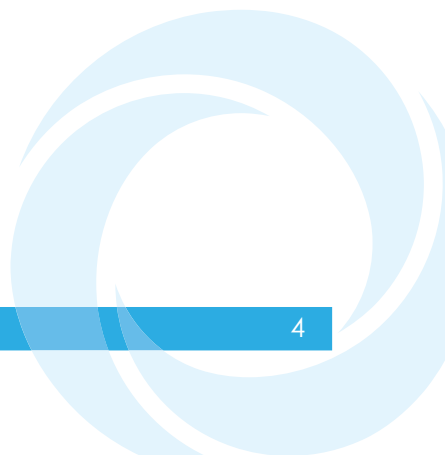
2.1.3 Designations

The entire Proposed Development Site is within a Scottish Biosphere Reserve, the extensive Galloway and Southern Ayrshire.

There are no environmental designations within the Proposed Development Site, however the Sitelink website (Sitelink, 2023) identifies 14 environmental designations within 10km of the boundary which are summarised below:

- Cairnmore of Fleet (SSSI/ National Nature Reserve);
- Loch Ken and River Dee Marshes (Ramsar Site);
- River Dee (Parton to Crossmichael) Site of Special Scientific Interest (SSSI);
- Skyreburn Grasslands (SSSI);
- Threave and Carlingwark Loch (SSSI);
- Woodhall Loch (SSSI);
- Ardwall Hill SSSI;
- Killiegowan Wood (SSSI);
- Lea Larks (SSSI);
- Laughenghie and Airie Hills (SSSI);
- Carstramon Wood (SSSI);
- Airds of Kells Woods (SSSI);
- Galloway Oakwoods (SAC); and
- Loch Ken and River Dee Marshes (SPA).

These are illustrated on Figure 2.



2.2 Proposed Development Design and Layout

The layout of the Proposed Development will continue to evolve throughout the EIA process, with the aim of avoiding or reducing significant environmental effects as far as reasonably practical. The layout design has been carefully considered to balance planning, environmental and commercial constraints.

The following work has been undertaken to date:

- Ornithology desk study, breeding bird, breeding raptor, black grouse and nightjar surveys (between 2019 - 2021);
- Ecology desk study and Extended Phase Habitat 1 survey;
- Initial peat probing in order to identify potential areas of deep peat;
- Ongoing review of potential landscape and visual feasibility and impacts and generation of zone of theoretical visibility maps;
- Initial review of access options;
- Initial review and appraisal of the historic environment of the Proposed Development Site and surrounding area, including historical landscapes and cultural heritage assets; and
- Initial review of other baseline conditions for disciplines including noise, telecommunications, aviation and hydrology.

An initial layout of the Proposed Development is shown on Figure 3 which is based on preliminary environmental and technical consideration with the intention of minimising the impact on nearby receptors as much as possible.

Table 1 below provides the Proposed Developments grid references, dimensions and base elevations.

Table 1: Wind Turbine Grid References, Dimensions and Elevations

Turbine ID	Eastings	Northing	Base Elevation AOD (m)	Blade Tip Height (m)	Hub Height (m)	Rotor Diameter (m)
1	264635	561845	213	180	102.5	155
2	264372	562139	220	180	102.5	155
3	264377	562615	210	180	102.5	155
4	263918	562673	231	180	102.5	155
5	263713	562142	227	180	102.5	155
6	265050	561218	216	180	102.5	155
7	264670	561387	201	180	102.5	155
8	265247	562674	188	180	102.5	155

Turbine ID	Easting	Northing	Base Elevation AOD (m)	Blade Tip Height (m)	Hub Height (m)	Rotor Diameter (m)
9	265451	562325	188	180	102.5	155

2.3 Benefits of the Proposed Development

The Proposed Development will consist of renewable technologies in the form of nine wind turbines and ground mounted solar panels.

Data produced as part of the Energy Yield Assessment (EYA) for the Proposed Development have been applied for the purposes of this assessment. This data indicates that a capacity factor of 36.7% for wind and 10.4% for solar is expected to be a more realistic scenario for the Proposed Development than that which is estimated by DUKES (BEIS 2022).

Based on an estimated capacity factor of 36.7% for wind and 10.4% for solar, the generation expected from the Proposed Development is in the region of 222,254 MWh per year.

Each unit of renewable energy (wind and solar) generated electricity will displace a unit of conventionally generated electricity, therefore, reducing emissions. Table 1 provides a breakdown of the estimated emissions displaced per annum and over the predicted 40-year lifetime of the project.

Table 2: Emissions Savings

Emissions	Annual (tonnes equivalent)	Lifetime (tonnes equivalent)	Calculation
Carbon Dioxide (CO ₂)	96,013	2,409,840	432kg of CO ₂ per MWh of Fossil fuel* (222,254 Mwh X 432kg) / 1000 = CO ₂ saving tonnes
Sulphur Dioxide (SO ₂)	1,155	29,000	5.2kg of SO ₂ per MWh of Fossil fuel** (222,254 Mwh X 5.2kg) / 1000 = SO ₂ saving tonnes
Oxides of Nitrogen (NO _x)	422	10,600	1.9kg of NO _x per MWh of Fossil fuel** (222,254 Mwh X 1.9kg) / 1000 = NO _x saving tonnes

*BEIS (2022)

** UK Government (2013) Estimate emissions from central power generating plant

The average domestic electricity consumption in Scotland is approximately 3.295MW annually (BEIS, 2022). Given that the expected generation from the Proposed Development is 222,254 MW, the Proposed Development therefore generates electricity equivalent to that required to power over 67,451 households in Scotland annually.

The Proposed Development will also make a significant contribution to reducing Scotland's CO₂ emissions and contribute directly to efforts to reduce the extent and rate of global climate change reflected in the ecological and climate emergency declared by DGC in June 2019.

The Proposed Development has the potential to have a significant beneficial effect on the local economy in terms of employment during the construction and operational stages. This is discussed further in Section 5.9.

The Applicant recognises that the Scottish Government Good Practice Principles For Community Benefits from Onshore Renewable Energy Developments (Scottish Government, 2019) advises that a voluntary community benefit package can be offered to communities near the Proposed Development. The Applicant will seek to offer a community benefit package to the local communities over the 40 year life of the project.

2.4 The Proposed Development Components

The following sets out the main components of the Proposed Development.

2.4.1 Wind Turbines

The Proposed Development comprises nine three-bladed horizontal axis wind turbines, up to 180m above ground level (agl) tip height.

2.4.2 Solar

The Proposed Development comprises ground mounted photovoltaic (PV) solar panels with a max height of 3.2 meters agl.

2.4.3 Battery Storage

The Proposed Development comprises of up to 20MW of battery storage units anticipated to be located adjacent to the substation.

2.4.4 Access Tracks

The design and route of the proposed access tracks will commence following wind turbine and solar array locations being finalised, ground conditions being confirmed, and environmental assessments completed. However, it is anticipated that existing forestry tracks (from the north) will be utilised for construction and operational access to the Proposed Development Site as much as possible to reduce the need for new access track and thus reduce the environmental impact.

Whilst the final route of this track has not yet been determined; an indicative access route and track layout is illustrated on Figure 3.

2.4.5 Borrow Pits

The Applicant is currently exploring the possibility of using on-site borrow pits to source aggregate for the Proposed Development, and the potential impact of proposed borrow pits will be considered in the EIA.

2.4.6 Electrical Layout and Grid Connection

The Applicant is currently considering a number of options for connection to the National Grid and as such the route of cabling off-site is yet to be determined.

This will be the subject of a separate application and therefore assessment of the route of grid connection is outside the scope of the EIA. The Proposed Development would be connected to the electricity network via an onsite substation/control building. The final location of this building will be determined during the evolution of the design of the Proposed Development but an indicative location is shown on Figure 3.

Electrical connections from the wind turbines and solar array to the onsite substation will be underground, and wherever practicable will be located alongside track infrastructure.

2.5 Project Phases

2.5.1 Construction

The construction of the Proposed Development is anticipated to take approximately 12 months. Subject to the ongoing design process, activities during the construction phase will include:

- Extraction of aggregate for access track, hard-standings and turbine base construction (If borrow pits are utilised);
- Construction of new access tracks to reach the turbine and solar panel locations;
- Construction of temporary hardstanding;
- Construction of turbine foundation and crane hardstanding;
- Excavation of trenches and cable laying;
- Installation of wind turbines, ground mounted solar panels, and battery energy storage;
- Commissioning of equipment;
- Installation of grid connection (not considered within this Scoping Report – subject to a separate planning application); and
- Decommissioning and restoration activities.

Many of these operations will be carried out concurrently to reduce the overall length of the construction programme. Post construction re-instatement will be undertaken at the earliest opportunity and in line with relevant prescribed planning conditions to minimise potential impact.

Construction will be controlled through a Construction Environmental Management Plan (CEMP) which will implement specific measures to ensure good practice and set out mitigation as required during construction. An outline CEMP will be provided with the EIA submission as a starting point for discussion.

Construction methods will be described further in the EIA Report.

2.5.2 Operation and Decommissioning

The operational period of the Proposed Development is anticipated to be 40 years after which the turbines and solar panels and associated infrastructure will be decommissioned and the site restored unless further permission is obtained allowing further operation or repowering.

3 Impact Assessment

3.1 EIA Process

EIA is a process which identifies the potential environmental effects of a development and then seeks to avoid, reduce or offset any adverse effects through design or mitigation measures where possible.

The process is intended to be iterative and runs in tandem with project design. As potential effects are identified, the design of the project (for example, the number and layout of the turbines) may be adjusted to reduce potential impacts.

The Applicant considers consultation to be a vital component of the EIA process and will continue to consult throughout each stage of the EIA, contributing to both to the identification of potential effects and mitigation measures.

3.2 EIA Guidance

The assessment of potential impacts will be undertaken in accordance with the EIA Regulations and with reference to appropriate guidance, including the Environmental Impact Assessment Handbook (SNH (now NatureScot) 2018) and Guidelines for Environmental Impact Assessment, Institute of Environmental Management and Assessment (IEMA, 2004).

3.3 Assessment Methodology

The EIA Regulations outline the information that is required to be presented in the EIA Report which includes the following:

- Description of the development;
- Outline of the main design and layout options studied by the Applicant;
- Description of the aspects of the environment likely to be significantly affected by the development;
- Description of the likely significant effects of the Proposed Development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development; and
- Description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.

The assessments will be undertaken by a number of specialists with expertise relevant to the potential impact being assessed.

The assessments will be coordinated to ensure that each follows a systematic, consistent approach, specifically:

- A description of baseline conditions;
- Prediction of potential effects including cumulative effects;
- Assessment of effects;
- Identification of appropriate mitigation measures; and
- Assessment of residual environmental effects.

The following sections describe these steps in more detail.

Baseline Description

Information relating to the existing conditions at the Proposed Development Site will be gathered through desk-based assessments, consultation and site surveys. Using this information, potential receptors will be identified, and the sensitivity of those receptors determined for the lifetime of the project.

Agreement on survey methodologies will be sought from relevant consultees and the information collection process and sources described in the EIA Report.

Prediction of Potential Environmental Effects

The prediction of effects will be made using the known parameters of the Proposed Development and through experience of similar projects. The prediction of effects includes consideration of the construction, operation and decommissioning phases of the project.

Assessment of Effects

In assessing the significance of identified impacts, a number of factors will be considered including:

- The sensitivity of the environmental resource to change including the capacity of the resource to tolerate change;
- The magnitude of the impact, i.e. the timing, scale, size and duration of the impact;
- The likelihood of the impact occurring;
- The certainty with which the potential impacts have been identified; and
- Comparison with the do nothing alternative, i.e. consideration of the possible changes in the environmental receptor should the project not to take place.

Individual methodologies for assessing effects will be explained in each of the technical assessments. For some assessments e.g. noise, the predicted effects will be either "acceptable" or "unacceptable". However, where the assessment is more subjective the effect significance will generally be considered in the following terms:

- Negligible: no detectable change to a location, environment, species or sensitive receptor;
- Minor: a detectable but non-material change to a location, environment, species or sensitive receptor;
- Moderate: a material, but non-fundamental change to a location, environment, species or sensitive receptor;
- Major: a fundamental change to a location, environment, species or sensitive receptor.

Effects identified as being moderate or major are considered to be "significant" in terms of the EIA Regulations.

Mitigation

The potential for environmental effects will be considered at every stage of the Proposed Development and the design and scheduling of the project refined accordingly to minimise or eliminate or mitigate those effects where practical.

The final design will therefore evolve over the project cycle and will be optimised systematically in response to increasing knowledge of the Proposed Development Site and potential environmental effects.

Where additional mitigation measures are identified, these will be presented in the specific technical assessments and follow standard techniques and good practice as appropriate. Mitigation strategies will include specific construction methods and site operations.

Cumulative Effects

In accordance with the EIA Regulations, cumulative effects of the Proposed Development in conjunction with other existing or approved developments will be considered. Cumulative effects can be considered in two ways:

- The combined effect from more than one source (e.g. noise and dust) from one development on a particular receptor; and
- The combined effect of several developments that collectively may result in a significant impact (although considered alone may not be significant).

The assessment of cumulative effects for a wind farm development is considered to be particularly relevant in terms of potential landscape and visual effects. Therefore, the additional effect of adding the Proposed Development to the existing will be considered in detail.

The design process for the Proposed Development will seek to achieve a layout that works alongside existing turbines within the local landscape.

3.4 Structure of the EIA Report

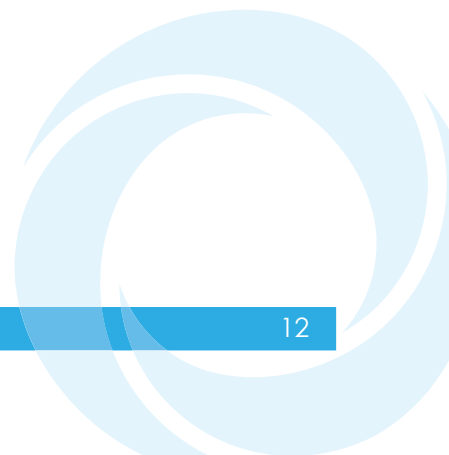
Table 2 presents the likely chapter titles which would be included in the EIA Report although this would be refined as required throughout the EIA process.

Table 3: Proposed EIA Report Chapter Titles

Chapter No.	Title
1	Introduction
2	EIA process and methodology (including scoping and consultation)
3	Project description (including design evolution)
4	Planning and energy policy
5	Landscape and visual impact assessment
6	Ecology
7	Ornithology
8	Hydrology, hydrogeology and soils (including peat, flooding and drainage)
9	Transport and Access
10	Cultural Heritage
11	Noise
12	Socio Economics
13	Climate Change
14	Other Considerations (glint and glare, health and safety, aviation, telecommunications and shadow flicker)

The chapters will be supported by a number of figures and technical appendices specific to each assessment. The EIA Report would be accompanied by a Non-

Technical Summary (NTS) which will provide a concise description of the EIA process and its findings.



4 Planning and Energy Policy

4.1 Introduction

This section presents a summary of relevant policies that will be taken into consideration to help inform the Proposed Development design.

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

The EIA report will also include a discussion of climate change policy and the contribution of Proposed Development to the UK and Scottish Government's climate change goals and policy targets. The potential contribution of the Proposed Development to the security of electricity supply will also be examined in the context of national energy policy.

4.2 National Planning Policy

4.2.1 National Planning Framework 4 (2023)

NPF4 was adopted by the Scottish Government (2023a) on 13th February 2023. It is a long-term plan that will guide spatial development, set out national planning policies, designate national developments and highlight regional spatial priorities.

NPF4 differs to NPF3 (Scottish Government, 2014a) in that it has increased status than the previous NPF3 and becomes part of the statutory Development Plan. This means that its policies have a stronger role in day-to-day planning decision making. NPF4 also supersedes Scottish Planning Policy (Scottish Government, 2014b), which is integrated into the new National Planning Framework.

NPF4 sets out increased emphasis on the 'net zero agenda' to bring together cross-cutting priorities and achieve sustainable development through three key themes; sustainable places, liveable places and productive places.

NPF4 incorporates the updated Scottish Planning Policy (Scottish Government, 2014b) into one document and Part 2 contains the new 'National Planning Policy'.

In relation to a policy for sustainable places NPF4 states:

"Our commitment to a just transition, means that our journey to a net zero society and nature recovery must involve, and be fair to, everyone. We will grow a circular economy and make best use of embodied carbon by conserving and recycling assets, including by encouraging sustainable design and the wise use of resources."

In terms of renewable energy generation, the framework acknowledges that:

"A large and rapid increase in electricity generation from renewable sources will be essential for Scotland to meet its net zero emissions targets"; noting that:

“Additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy and supports improved network resilience in rural and island areas”;

Policy 1 'Tackling the climate and nature crises', aims to:

“...encourage, promote and facilitate development that addresses the global climate emergency and nature crisis”.

Policy 2 'Climate mitigation and adaptation' seeks to:

“... encourage, promote and facilitate development that minimises emissions and adapts to the current and future impacts of climate change.”.

This indicates that climate change should be a guiding principle for decision making and that substantial policy support is given to any proposed development which makes a contribution towards climate change targets.

Policy 3 'Addressing the global biodiversity crisis' seeks for development proposals to:

“...contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible”.

“...for development that requires an Environmental Impact Assessment will only be supported where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention”.

“...any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be minimised through careful planning and design. This will take into account the need to reverse biodiversity loss, safeguard the ecosystem services that the natural environment provides, and build resilience by enhancing nature networks and maximising the potential for restoration”.

Development proposals should seek to contribute to addressing the global biodiversity crisis through enhancement, conservation and restoration and that adverse impacts should be minimised through careful planning and design.

The intent of Policy 11: Energy is stated as:

“To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisation and storage (CCUS).”

Paragraph a) of Policy 11 states that:

“Development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported. These include:

- i. wind farms including repowering, extending, expanding and extending the life of existing wind farms”*
- iii. energy storage, such as battery storage and pumped storage hydro*

- v. solar arrays
- vii. proposals including co-location of these technologies

Paragraph e) of Policy 11 states that:

"In addition, project design and mitigation will demonstrate how the following impacts are addressed"; including

"...significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/ or appropriate design mitigation has been applied, they will generally be considered to be acceptable"

It is clear within NPF4 that the generation of renewable energy is recognised as being of national importance as:

"significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets."

NPF4 policies, including those detailed above will inform the progress of the design of the Proposed Development.

4.2.2 Onshore Wind Policy Statement 2022

The 2022 Onshore Wind Policy Statement sets out the Scottish Government's ambition to reach 20 Gigawatts (GW) of onshore wind by 2030 (Scottish Government, 2022).

4.3 Local Development Plan

The relevant provisions of the Local Development Plan (LDP) are important material considerations in relation to the Proposed Development.

The Local Development Plan and supplementary guidance applicable to the Proposed Development currently consists of

- Dumfries and Galloway Council Local Development Plan 2 (DGC LDP2) (October 2019); and
- Supplementary guidance: Wind Energy Development: Development Management Considerations (February 2020); and
- Supplementary guidance: Part 1 Wind Energy Development: Development Management Considerations Appendix 'C' DGWFLCS (February 2020).

Since the adoption of NPF4, references in supplementary guidance to 'spatial framework', 'spatial planning' and 'areas of search', in relation to onshore wind turbines are now out of date and therefore not relevant. Other aspects of the supplementary guidance will inform the evolution of the design of the Proposed Development.

4.3.1 Dumfries and Galloway Council Local Development Plan

The DGC LDP2 was adopted in October 2019 and it provides the planning framework and guides the future use and development of land in towns, villages and the rural area. It also indicates where development, including regeneration, should and should not happen.

The LDP also presents the policies against which the Proposed Development will be assessed. It is anticipated that the following key policies will inform the design of the Proposed Development on the assumption that these will be the policies against which the proposals will be reviewed:

- Policy IN1: Renewable Energy;
- Policy IN2: Wind Energy;
- Policy IN7: Flooding and Development;
- Policy IN8: Surface Water Drainage and Sustainable Drainage Systems (SuDS);
- Policy OP1: Development Considerations;
- Policy OP2: Design Quality and Placemaking;
- Policy ED10: Galloway and Southern Ayrshire Biosphere;
- Policy ED11: Dark Skies;
- Policy HE1: Listed Buildings;
- Policy HE2: Conservation Areas;
- Policy HE3: Archaeology;
- Policy HE4: Archaeologically Sensitive Areas;
- Policy HE6: Gardens and Designated Landscapes;
- Policy NE1: National Scenic Areas;
- Policy NE2: Regional Scenic Areas;
- Policy NE4: Sites of international Importance for Biodiversity;
- Policy NE5: Species of International Importance;
- Policy NE6: Sites of National Importance for Biodiversity and Geodiversity;
- Policy NE7: Forestry and Woodland;
- Policy NE8: Trees and Development;
- Policy NE11: Supporting the Water Environment;
- Policy NE12: Protection of Water Margins;
- Policy NE13: Agricultural Soil;
- Policy NE14: Carbon Rich Soil;
- Policy NE15: Protection and Restoration of Peat Deposits as Carbon Sinks;
- Policy T1: Transport Infrastructure;
- Policy T2: Location of Development/Accessibility; and
- Policy CF4: Access Routes.

The following Supplementary Guidance is considered to be relevant to the Proposed Development and will be reviewed and used to inform the progress of the design:

- Supplementary guidance: Wind Energy Development: Development Management Considerations (February 2020);
- Supplementary Guidance: Historic Built Environment (June 2017);
- Supplementary Guidance: Trees and Development (October 2015);
- Supplementary Guidance: Flooding and Development (February 2020);
- Supplementary Guidance: Surface Water Drainage and Sustainable Drainage Systems (February 2020);
- Supplementary Guidance: Dark Skies Friendly Lighting (February 2020);

- Supplementary Guidance: Gatehouse of Fleet Conservation Area Character Appraisal (February 2020); and
- Supplementary guidance: Part 1 Wind Energy Development: Development Management Considerations Appendix 'C' DGWFLCS (February 2020).

The LDP2 'Wind Energy Development: Development Management Considerations' Supplementary Guidance (February 2020) provides further detail in support of the development management considerations in Policy IN2 'Wind Energy'. It sets out a statement on the main factors that are to be taken into account in reaching planning decisions and details the criteria contained in the policy. As noted above, since the adoption of NPF4, references in supplementary guidance to 'spatial framework', 'spatial planning' and 'areas of search', in relation to onshore wind turbines are now out of date and therefore not relevant. Other aspects of the supplementary guidance will inform the evolution of the design of the Proposed Development.

4.4 Climate Change and Energy Policy

Climate change has been described as the greatest environmental challenge facing the world today. The burning of fossil fuels to produce electricity is a major contributor to climate change through the release of atmospheric carbon dioxide (CO₂) and other harmful gases known collectively as greenhouse gases. As part of the response to climate change, the UK and Scottish Governments have entered into binding international agreements, committing to reducing greenhouse gas emissions.

The generation of electricity from renewable energy sources is one of the principal ways in which the Scottish Government targets to reduce greenhouse gas emissions are to be met within the current policy framework. Onshore wind energy is recognised as one of the most viable and economic renewable energy technologies available at the present time with Scotland having an excellent wind resource (Scottish Government, 2010).

It is relevant to note that the UK and Scottish Governments have declared a Climate Emergency (Scottish Government, 2019) as has Dumfries and Galloway Council. While there is no formal obligation to act associated with this status it does emphasise a public and political desire to increase the effort to combat climate change and may result in climate change targets being brought forward.

The Proposed Development comes as a direct response to national planning and energy policy objectives. The clear objectives of the UK and Scottish Governments will be considered, in relation to encouraging increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.

The design and assessment of the Proposed Development will be progressed in line with relevant climate change and energy policy and guidance including:

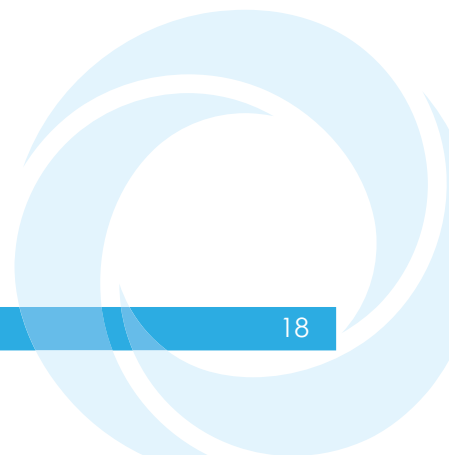
- COP26 – The Glasgow Climate Pact;
- COP27 – The Sharm el-Sheikh Implementation Plan;
- Net Zero Strategy: Build Back Greener;
- UK Climate Change Risk Assessment 2022;
- Climate Change (Emission Reduction Targets) (Scotland) Act 2019;
- Scotland's Climate Assembly: Recommendations for Action 2021;

- Towards a Robust, Resilient Wellbeing Economy for Scotland, a report of the Advisory Group on Economic Recovery (June 2020);
- Update to the Climate Change Plan 2018-2032: Securing a Green Recovery on a Path to Net Zero;
- Scottish Energy Strategy (2017);
- Scotland's Energy Position Statement (2021);
- Draft Energy and Just Transition Plan (2023); and
- Onshore Wind Policy Statement (2022).

The EIA Report will summarise the renewable energy policy framework that has informed the design and the assessment, but a detailed policy appraisal and assessment of need for the Proposed Development will be provided in a supporting Planning Statement which will make reference to key policy documents.

4.4.1 Dumfries and Galloway Council Climate Emergency Declaration

In June 2019, DGC officially recognised their responsibility to tackle climate change, taking the radical and comprehensive step of declaring a Climate Emergency. A 12 point plan was set out, with the aim to reinvigorate the pursuit of net zero carbon emissions in the area, alongside the protection of the local biodiversity and natural environment. DGC wish to lead on the transition to cleaner and greener technologies, and maximise the region's green energy potential, in pursuit of carbon neutrality.



5 Potential Environmental Effects

5.1 Introduction

This section presents a summary of consultation undertaken to date, the environmental baseline, an overview of the potential effects and the proposed methodology for impact assessment, with the key questions to consultees covering a variety of technical disciplines.

5.2 Landscape

5.2.1 Consultation

A summary of pre application responses received in January 2021 from Dumfries and Galloway Council and relevant consultees in respect of landscape and visual matters summarised below.

DGC Case Officer

The pre-application response includes a section on Landscape and Visual Impacts. This covers landscape character and designated landscapes, landscape sensitivity/capacity (constraints/opportunities) and cumulative impacts, citing relevant policies, studies and guidance including the DGWLCS. LDP2 Policy IN2 is noted as of particular importance in relation to the key concerns regarding *“the extent to which the landscape is capable of accommodating the development without significant detrimental landscape and visual effects... [and] that the scale of the proposal is appropriate to the scale and character of its setting, respecting the main features of the site and the wider environment and that it addresses fully the potential for mitigation...”*

With regard to designated landscapes, *“Particular attention must be given to the impacts on the Fleet National Scenic Area.”*

The response concludes that “whilst detailed proposals have yet to be finalised, it is likely that the proposed location and turbine typology is likely to conflict with, and be at odds to, the guidance in the DGWLCS in respect of both the host LCT and adjoining LCT’s with the likely prominence from adjacent sensitive landscapes given as a key constraint. The proximity to the Fleet Valley NSA is a key consideration and based on the comments provided by NatureScot, there are concerns that the proposal may cause significant adverse effects on the special qualities of the Fleet Valley NSA, such that the objectives of the designation and overall integrity of the area could be compromised which would conflict with the requirements of LDP2 Policy NE1.”

Further consultation will be undertaken, as set out below, with relevant consultees in respect of other elements of the assessment as required information becomes available.

DGC Landscape Architect

The pre-application advice provided by the landscape architect was comprehensive, some of which also overlapped with that provided by NatureScot.

The advice can be summarised as follows, in the order the advice was set out:

- Fleet Valley National Scenic Area (NSA) – to provide a Special Landscape Qualities (SLQ) Assessment, referring to NatureScot's Draft Guidance for Assessing the Effects on Special Landscape Qualities. In addition, reference should be made to The Fleet Valley Management Plan (DGC) non-statutory guidance (tied to the Development Plan through LDP2 policy NE1);
- A bare-ground ZTV should be provided in the assessment, which will assist in the SLQ Assessment. Additionally, a selection of wirelines from key viewpoints should be provided;
- Full reference should be made to the relevant sections of LDP 2 Supplementary Guidance on Wind Energy Development, including the Appendix C capacity study (the DGWLCS). The key findings of the study should also be referred to, especially in relation to existing clusters of development, and scope for Very Large turbines;
- Representative viewpoints – a wide selection of potential locations was provided including those representing sequential route views, views from the Fleet Valley NSA, the Solway Coast RSA, summits and area of recreational and public interest; and
- An aviation lighting assessment, as required by NatureScot – including a ZTV showing areas affected by aviation lighting, wirelines and position of lighting for each turbine at each viewpoint. In addition, full aviation lighting photomontages (the requirement to be based on the information in wirelines) should be provided for particularly sensitive receptors, noting residential, recreational, the Fleet valley NSA, Solway Coast RSA, the Galloway Hills Dark Sky Park and Merrick WLA.

NatureScot

With regard to landscape and visual effects, NatureScot:

- Requires a bare ground ZTV (to take account of winter screening);
- Expects that turbine lighting would be required and that *“a hub height ZTV would assist in identifying those areas where lighting would be visible”*;
- Considers that the Fleet Valley NSA *“could be sensitive to development of turbines of this height, as this could conflict with the smaller more intimate scale and could detract from key focal points and features within the Fleet valley, particularly if it was visible along the enclosing easterly edge.”*;
- Recommends *“that special qualities of the NSA are reviewed and an assessment made of the proposal against them to see if these adverse effects could be reduced, removed or otherwise mitigated. We have produced draft guidance on assessing the impacts of development on special landscape qualities which is presented in Annex 1 of this letter as it is not yet available on the NatureScot website.”*; and
- Additionally, NatureScot concludes that *“At this early stage and with outline information it is difficult for us to come to a fully informed view, however noting the likely pattern of visibility across the NSA we consider that the proposal may cause significant adverse effects on the special qualities of the Fleet Valley NSA, such that the objectives of the designation and overall integrity of the area could be compromised. We might therefore object to this proposal.”*

5.2.2 Methodology & Guidance

The Landscape and Visual Impact Assessment (LVIA) will be prepared with reference to the following:

- Landscape Institute (LI) and the Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA 3);
- Landscape Institute (2019) Technical Guidance Note 2/19 Residential Visual Amenity Assessment;
- Landscape Institute (2019) Technical Guidance Note 6/19 Visual Representation of Development Proposals;
- Scottish Natural Heritage (2020) Assessing impacts on Wild Land Areas – Technical Guidance;
- Scottish Natural Heritage (updated 2021) Assessing the Cumulative Impact of Onshore Wind turbine developments;
- Scottish Natural Heritage (2015) Spatial Planning for Onshore Wind Turbines – Natural Heritage Considerations;
- Scottish Natural Heritage (2017) Visual Representation of Wind Farms (Version 2.2);
- Scottish Natural Heritage (2017) Siting and Designing Wind Farms in the Landscape (Version 3);
- Scottish Natural Heritage (2019) Landscape Character Assessment in Scotland digital map based LCA;
- Natural England (2014) An Approach to Landscape Character Assessment;
- NatureScot (November 2020) Draft Landscape Sensitivity Guidance; and
- Local baseline studies as referenced above.

5.2.3 Baseline and Potential Effects

Proposed Development Site Location

The Proposed Development is located, 6.8km (Wind Development) and 7.8km (Solar Development) northeast of Gatehouse of Fleet, 10km (Wind Development) and 8.5km (Solar Development) north of Kirkcudbright and 11km (Wind Development) and 8km (Solar Development) west of Castle Douglas on an area of low, undulating hills in Dumfries and Galloway.

The Proposed Development is bordered by the Laurieston Forest to the north, the Glengap Forest to the west and southwest and woodland and forestry to the south of the proposed solar farm and east of the A762. Moorland and farmland descend into the settled valley to the east. The A75 runs within 4km of the Proposed Development Site (solar farm) to the southeast, running in a northeast to southwest direction. The A762 runs in a north-south direction immediately adjacent to the Proposed Development Site (solar farm), crossing the A75 near Ringford before continuing south.

The area surrounding the Proposed Development is home to dispersed settlements connected by minor roads between the A762, A75, B727 and Laurieston Road. The closest individual residential properties to the Wind Development would be Edgarton and Upper Lairdmannoch approximately 1.5km to the east. The closest residential property to the Solar Development is Upper Lairdmannoch, located approximately 200m to the north. Recreational routes include core paths providing access to moorland and forest areas and the National Cycle Network Route (NCNR) 7 which comes within 5.6km west of the Wind Development as it progresses along the B796.

Turbine development in the surrounding area is relatively sparse, with Blackcraig Hill wind farm being the closest operational site at 19km north of the Proposed Development. The operational Plascow turbines are more distant at 22km east of the Proposed Development Site. There are two consented single turbines at Trostie and High Barcaple, both within 3km of the Proposed Development Site.

No solar developments are present within the surrounding area.

Visual Amenity

The surrounding area is intersected by a network of minor and major roads connecting small to medium sized settlements.

Notable settlements within the ZTV include:

- Laurieston – 3km N;
- Twynholm – 7.1km S;
- Gatehouse of Fleet – 6.6km SW (although very little visibility);
- Crossmichael – 8km NE;
- Kirkcudbright – 10.1km S; and
- Castle Douglas – 11km E.

There also individual farms and dispersed settlement along most of the roads in the local area. More distant settlements within the ZTV in coastal areas to the southeast; around Castle Douglas to the east and to the north and northeast of the Proposed Development Site along the A713.

Landscape Character

The most relevant landscape character assessment and sensitivity study in relation to the proposed wind farm is provided as part of the Dumfries and Galloway Wind Energy Development Management Considerations Supplementary Guidance (DGWEDMC) which includes the current landscape capacity study.

This study identifies the wind farm as being wholly located within the Dumfries and Galloway Landscape Character Type (LCT) 18a: Foothills with Forest – Laurieston Unit. The Host LCT is identified within the capacity study as having a medium to-high/medium sensitivity to large scale turbines.

The Solar Development would be located within LCT 18a and neighbouring LCT 13 Drumlin Pastures – Deeside Unit (respectively NatureScot LCTs 176 and 169).

Landscape Designations

The Proposed Development is not located within any international, national or local landscape related planning designations. Nearby designated landscapes within the ZTV are as follows:

- Galloway Hills Regional Scenic Area – 1km W of the Wind Development and 3.7km SW of the Solar ;
- Galloway Dark Skies Park (GDSP) – the core and buffer areas of the GDSP are 18km NW and 3.3km W of the Wind Development;
- Fleet Valley National Scenic Area – 4.1km W of the Wind Development and 6.8km SW of Solar Development;
- Solway Coast Regional Scenic Area – 7.6km SE of the Wind Development and 6km S of the Solar Development;

- East Stewartry Coast National Scenic Area – 13km SE of the Wind Development and 11.3km SE of the Solar Development; and
- Machars Coast Regional Scenic Area – 19.7km SW of the Wind Development and 21.6km SW of the Solar Development.

The closest Wild Land Area (WLA) to the Proposed Development is WLA 01: Merrick, which is 24km from the Wind Development. The ZTV of the Wind Development (Figure 4) indicates very limited potential visibility from the area, confined to a small number of hill summits. There are a number of other operational and consented wind farms located closer to the WLA, and it is anticipated that the key attributes or wildness qualities of the WLA would not be notably affected by the proposed development and therefore effects are proposed to be scoped out of the LVIA.

It is noted that the impacts on gardens and designed landscape will be covered under the Cultural Heritage assessment.

Potential Effects – Wind Development

Visual Amenity

Effects are likely to be experienced from the settlements listed above, as well as dispersed settlement.

Key routes likely to be affected within the study area include the A75 between Brooklands and Gatehouse of Fleet, the A713 between Loch Ken and Castle Douglas, the A726 between Loch Ken and Tongland, the A755 & A711 between Gatehouse of Fleet and the Solway Coast.

Effects on minor roads and recreational routes in the area will also form part of the assessment including Laurieston Road between Laurieston and Gatehouse of Fleet, the B795 west of Laurieston, the B727 & National Cycle Network Route 7 between Castle Douglas and Gatehouse of Fleet and core paths & local walking trails within the study area and ZTV (Figure 4).

Landscape Character

Effects of the Wind Development will be present throughout the host LCT, as seen on the ZTV (Figure 4) and will be assessed in relation to the DGWEDMC with the Dumfries and Galloway Landscape Charter Assessment referenced as required for additional context. In addition to the host LCT, taking account of the visibility pattern indicated by the ZTV study, character types within 10-15km with potential visibility will be assessed.

Landscape Designations

The assessment of effects on the above listed designated landscapes would be based on the potential impact on their special qualities as set out in the relevant studies:

‘Special qualities of the National-Scenic-Areas’ (SNH 2010); and

‘Regional Scenic Areas – Technical Paper’ (DGC, 2018).

Representative viewpoints have been chosen from within each designation to illustrate effects resulting from the Proposed Development, but mainly as a result of the Wind Development rather than the Solar Development.

Potential Effects - Solar Development

Visual Amenity

Effects are likely to be largely concentrated around the Proposed Development Site due to its low-level nature (3m in height) and valley bottom setting. The division of the solar panels into two distinct groups (north and south) by the intervening landform of Linn Hill provides screening from different visual perspectives, as illustrated in the Figure 5. Figure 5 shows that there would be limited potential for simultaneous views of both the northern and southern groups and that overall, the northern area would have a wider visual envelope than the southern area, though mainly confined by topography and forestry to the north of the Proposed Development Site.

Landscape Character

Effects of the Solar Development will be present within a small part of the host LCTs (8a and 13), as seen on the ZTV and will be assessed in relation to the Dumfries and Galloway Landscape Character Assessment.

5.2.4 Impact Assessment

The LVIA will consider direct and indirect effects on landscape resources, landscape character, designated landscapes and wild land arising from the Proposed Development (comprising separate areas of wind turbines and solar panels).

It will examine the nature and extent of effects on existing views and visual amenity. The effects of the Proposed Development, as well as the ancillary infrastructure (access track, masts, transformers etc.) will be assessed, including potential night-time effects arising from lighting (of the wind turbines). The LVIA will also consider cumulative effects i.e. the incremental effects of the Proposed Development in combination with other renewable energy developments.

The LVIA will inform modifications and refinements to the layout design of the Proposed Development and will be undertaken following the approach set out in Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3). The assessment will also draw upon current good practice guidance issued by NatureScot.

Study Area – Wind Development

An initial study area of 45km has been used for the Zone of Theoretical Visibility (ZTV) study in line with SNH guidance on Visual Representation of Wind Farms: Version 2.2 (2017). Based on the visibility pattern and cumulative context a study area of 25km from the turbines is proposed as being suitable to assess the likely significant effects of the Wind Development on the landscape of the Proposed Development Site and its immediate surroundings, with more detailed study areas from the outer turbines to be defined for the individual elements of the work. This detailed study area will be informed through on-going assessment work but is likely to be as indicated below for each of the relevant sub-topics.

Figure 4 shows a bare earth ZTV for the Wind Developments.

Study Area – Solar Development

Based on the visibility pattern and cumulative context of the Solar Development, a study area of 5km from the Proposed Development Site is considered as being suitable to assess the likely significant effects on the landscape of the Proposed Development Site and its immediate surroundings.

Figure 5 shows a ZTV with the screening effect of woodland and settlements for the Solar Development.

Development Phasing

The LVIA will consider the potential effects of the Proposed Development during the following development stages:

- Construction and decommissioning of the Proposed Development; and
- Operation of the Proposed Development.

Visual Assessment

The assessment will be a receptor-based assessment – grouping the various receptor types listed above into area-based groups. This provides a less-fragmented assessment and better reflects effects on people who live within or visit the different areas around the Proposed Development Site areas. Effects on users of long-distance routes across the study areas will be considered separately – reflecting the experience of the journeys made and the potential for effects to differ depending on direction of travel. The assessment will focus on those receptors where there may be the potential for significant effects, which is likely to be those within approximately 15km of the Wind Development and 2-3km of the Solar Development.

Viewpoints

The proposed viewpoint locations are shown in Table 3 and on Figures 4 and 5. Given the early stage of the site work and design process, the proposed viewpoints still require to be 'ground-truthed' and are likely to require refinement following design evolution and precise distances from the Proposed Development may also change.

Table 4: Proposed Viewpoints

Viewpoint Reference	Location (W = Wind Development / S = Solar Development) <i>Where two letters shown, the first is the principal reason for selection</i>	Distance and Direction from Scoping Layout <i>Unless otherwise stated, distance from Wind Development is from nearest turbine</i>
1	A762, Kirkconnell (S/W)	0.3km SE from solar farm
2	A762, Lairdmannoch Bridge (S/W)	0.4km NE from solar farm
3	Neilson's Monument (W/S)	1km E from solar farm
4	Glengap (W)	1.7km S
5	Minor road between Gatehouse and Laurieston, near Darngarroch Bridge (W)	1.7km NW
6	Loch Mannoch, core path (W)	1.9km SE
7	Laurieston, A762 (W)	3.4km NE
8	Underwood (W)	7km SE

Viewpoint Reference	Location (W = Wind Development / S = Solar Development) <i>Where two letters shown, the first is the principal reason for selection</i>	Distance and Direction from Scoping Layout <i>Unless otherwise stated, distance from Wind Development is from nearest turbine</i>
9	B796 near Upper Rusko (W)	7.2 km W
10	Milnthird (W)	8.1km SE
11	Parton viewing point (W)	8.5km NE
12	Threave Castle (W)	8.5km E
13	Crossmichael (W)	8.8km NE
14	Kirkcudbright (W)	10.5km S
15	Castle Douglas (W)	10.7km E
16	Cairn Edward Hill (W)	10.8 km N
17	Cairnharrow (W)	12km SW
18	Mossyard Bay (W)	13.5km SW
19	Scree Hill (W)	14km SE
20	Cairnsmore of Fleet (W)	14.2km NW

Visualisations

The assessment will be supported by a series of photomontages and wireframes from agreed viewpoint locations. Visualisations from each viewpoint will be prepared in accordance with SNH guidance Visual Representation of Windfarms: Version 2.2 (2017).

Photomontages for the Wind Development will be prepared for viewpoints within a 25km radius. Ancillary elements will only be shown from close viewpoints where they are likely to be of particular relevance (normally within 5km), as it is considered that from most viewpoints these ancillary elements such as tracks would only form a minor element of the Wind Development and would not be atypical of the present landscape or views.

Photomontages for the Solar Development will be prepared within a 2km radius. Given the close proximity of some viewpoints to the Solar Development, ancillary elements such as inverters, transformers and security fencing/lighting, along with landscape/biodiversity enhancements, will be included within the photomontages. For each photomontage, the development will be represented at present, and at years 1 and 15 (illustrating the progression of vegetative screening from initial planting to maturity). The current proposal is to include fully-rendered photomontages from viewpoints 1, 2 and 3 as shown on Figure 5. For all other relevant viewpoints, an annotated photopanel will be provided, which will show the existing view and an indication of the extent of the Solar Development.

Cumulative Assessment

Wind Development

In line with NS guidance Assessing the Cumulative Impact of Onshore Wind Energy Developments (NatureScot 2012, updated 2021) the assessment will consider other wind farms within the detailed LVIA study area including those which are operational, consented and those for which an application has been submitted but which are yet

to be determined. Schemes in scoping will only be included by exception where there is specific justification for doing so.

The main LVIA assessment will include those operational and consented developments, as part of the future baseline. The cumulative assessment will focus on those developments with a submitted planning application and not yet determined. An initial cumulative search will be undertaken for the detailed study area, proposed as 20km for this purpose, for all other wind farm developments. These will include all operational schemes, those schemes under construction, consented schemes, those schemes in the planning system as valid applications (including schemes at appeal) and those at the scoping stage within this search area. Withdrawn sites will not be included, and those sites registered with a Proposal of Application Notice (PAN) are not finalised applications and will therefore not be included as a valid application but will be included as a pre-application/scoping scheme. Single turbines and turbines of under 50m in height will only be included within 5km of the Proposed Development Site.

The detailed scope of the cumulative assessment will be confirmed with consultees nearer the time of the submission. The proposed scope of the cumulative assessment will focus on where there may be likely significant effects which may influence the outcome of the consenting process.

Solar Development

There are no known operational, consented or 'in planning' solar developments located within 5km of the Proposed Development Site. However, during the assessment, and following consultation with DGC, the scope of any potential cumulative assessment will be established (including the type of sites, e.g. solar and battery storage).

Residential Visual Amenity Assessment

A separate assessment of the effects on residential visual amenity will be undertaken as a standalone appendix/document. This will be undertaken in line with Landscape Institute Technical Guidance Note 2/19: Residential Visual Amenity Assessment (RVAA) (Landscape Institute, 2019).

The study area for the RVAA will be 2km from the proposed wind turbines, but will include impact of the Proposed Development (wind and solar).

Night-time Impact Assessment

An assessment of the effects at night arising from visible aviation lighting on wind turbines within the Wind Development will be provided. No permanent lighting will be required for the Solar Development however some temporary lighting during construction may be required and will be assessed accordingly in the application. This will consider effects on landscape character, views and designated landscapes within 15km of the Wind Development as well as more sensitive night-time receptors extending beyond this area – in particular the Galloway Dark Skies Park.

Supporting visualisations and figures will include the diagrammatic illustration of lighting on wirelines for all assessed viewpoints and ZTV studies for the visibility of hub and tower lights.

A limited number of photomontages (approximately 3) will be prepared from the most affected viewpoints – to be agreed with consultees following design finalisation.

Approach to Mitigation

Wind Development

The primary form of mitigation for landscape and visual effects is through iterative design of the layout of the wind turbines and infrastructure, as seen from key viewpoints. Design development will be set out in detail in the design strategy that will form part of the EIA Report.

Solar Development

Due to the low-level nature for solar panels (c.3m in height), mitigation measures in the form of boundary hedgerow enhancement/establishment and the planting of trees and woodlands (site-dependent) can, if managed properly, provide effective screening of the development. Additionally, a landscape-led approach to landscape and ecological enhancement can deliver biodiversity benefits, supporting local landscape and ecological strategies/priorities.

Matters Scoped Out

Effects on Landscape Character

Character areas and types located more than 10-15km from the proposed turbines are considered unlikely to experience significant effects and will not be considered. For the solar farm, this distance is considered to be 2km.

Nationally Designated Landscapes

The potential for effects on nationally designated landscapes more than 25km from the proposed turbines are not likely to be significant and will not be considered. For the solar farm, effects on national landscape designations would not be considered to be significant (all over 11km away).

Locally Designated Landscapes

Locally designated landscapes more than 15km from the Wind Development are considered unlikely to experience significant effects and will not be considered. Similarly, local landscape designations located more than 3km from the Solar Development are considered unlikely to experience significant effects and will not be considered. There are no local landscape designations within 4km of the Solar Development.

Wild Land Assessment

As set out above no wild land assessment is proposed.

Cumulative – Small Developments

Turbines below 50m and single turbine developments will be considered within a 5km radius of the Wind Development and are scoped out of the assessment beyond this distance. Small-scale domestic solar energy sites are scoped out of the assessment.

5.2.5 Questions to Consultees

- Is the scope of the assessment for both the Wind Development and the Solar Development, acceptable? In particular:
- Are the study areas appropriate?
- Are the landscape and visual receptors included appropriate?

- Is the selection of viewpoints acceptable?

5.3 Cultural Heritage

5.3.1 Consultation

A summary of pre application responses received in January 2021 from Dumfries and Galloway Council and relevant consultees in respect of cultural heritage matters summarised below.

Historic Environment Scotland (HES)

HES stated that there were no assets within the remit of relevance to HES within the Proposed Development Site. Assets within the remit of relevance to HES include assets considered to be of Very High and High importance or of international and national importance such as World Heritage Sites, Scheduled Monuments, Category A Listed Buildings, Inventory Gardens and Designed Landscapes (GDL) and Inventory Battlefields.

Based on the information HES were provided with in 2020, HES stated that there was not enough information to consider how adversely the previous iteration of the Wind Development would impact the settings of nearby heritage assets. HES did provide a list identifying six Scheduled Monuments, two Category A Listed Buildings and a GDL located within proximity to the Proposed Development Site which may be impacted. It was also noted that any assessment would need to consider the impact of the previous iteration on the local and long-distance views to and from Scheduled Monuments as well as the importance of any designed intervisibility.

Of particular concern was the Scheduled Loch Mannoch, cairn & stone circle (Asset 1) which based on the previous iteration of the Wind Development would have been located 500 m to the east. HES were concerned that a Wind Development would have an adverse impact on the setting of this Scheduled Monument.

HES advised that any assessment should be supported by visualisations including photomontages and wirelines.

The issue of woodland was also mentioned with HES stating that woodland is not considered to be permanent and thus when assessing the impact of the previous iteration of the Wind Development woodland should not be considered permanent screening.

DGC Built Heritage Policy Officer

The DGC Built Heritage Policy Officer identified two heritage assets which “*would be visually affected*” by the previous iteration of the Wind Development. These were the Gatehouse of Fleet Conservation Area (centred Asset 139) and its associated Listed Buildings and the Cally GDL (centred Asset 37). In addition, the following heritage assets were identified:

- An Archaeologically Sensitive Area (ASA) of Loch Mannoch (centred Asset 65) which extended within the previous iteration of the Wind Development; Kirkconnel House- Category B Listed Building (Asset 62);
- Two Scheduled Monuments described as on the edge of the previous iteration of the Wind Development (likely Loch Mannoch cairn and stone circle (Asset 1));

- Grobdale ASA (centred Asset 66); and
- Lauriston Hall and Designed Landscape- Category B Listed Building (Asset 60).

It was also noted that “woodland screening” would depend on harvesting cycles and schedules and that only woodland that is not planned on being cut should be included as a screening element in the ZTV.

In regard to a requirement for visualisations, the Officer identified views from the:

- Martyr’s Monument (it is unclear which monument the Officer is referring to); and
- The Towers of Kirkconnel area (between 1 km and 5 km south-east of the Proposed Development Site).

DGC Archaeology Service

No comments were provided.

DGC Case Officer

The pre-application response included a section on the Impact on Cultural Heritage. This section noted that the policies which would be relevant to any assessment of the impact on cultural heritage. These have been listed in section 5.3.2 below.

In terms of direct impacts, a number of historic assets of regional, local or other significance were identified within the previous iteration of the Wind Development footprint. No further details as to what these assets are was provided in the Council’s pre-application response. It was requested that any assessment be informed by a walkover survey.

In regard to an assessment of the impact of the previous iteration of the Wind Development on the setting of assets it was requested that all regionally significant (Category C and B Listed Buildings) assets be assessed within 5 km of the Proposed Development Site; and that all nationally designated assets, including those identified by the Archaeology Service (Archaeologically Sensitive Areas, non-inventory landscapes, Conservation Areas) be assessed up to 10 km from the Proposed Development Site. It was requested that a zone of theoretical visibility (ZTV) be used to inform the assessment of the impact of the proposed development on the settings of heritage assets within these study areas.

5.3.2 Methodology & Guidance

The EIA Report will be prepared in accordance with relevant national and local legislation, policy, and guidance on the historic environment:

Legislation and Policy

- Ancient Monuments and Archaeological Areas Act 1979 (as amended) (UK Government 1979);
- Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 (as amended) (UK Government 1997);
- Planning etc. (Scotland) Act 2006 (UK Government 2006);
- Historic Environment (Amendment) (Scotland) Act 2011 (Scottish Government 2011a);
- Historic Environment (Scotland) Act 2014 (Scottish Government 2014b);

- Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (UK Government 2017);
- National Planning Framework 4 (NPF4) (Scottish Government, 2023);
- Historic Environment Policy for Scotland (Historic Environment Scotland (HES) 2019), including Designation Policy and Selection Guidance (HES 2019; Updated 2020); and
- Dumfries and Galloway Local Development Plan 2 (LDP2) (DGC, 2019)
 - Policy HE1: Listed Buildings
 - Policy HE2: Conservation Areas
 - Policy HE3: Archaeology
 - Policy HE4: Archaeologically Sensitive Areas
 - Policy HE6: Gardens and Designed Landscapes
 - Policy IN1: Renewable Energy
 - Policy IN2: Wind Energy

Technical Guidance

The following guidance documents will be consulted during the assessment to assist in the determination of potential effects on heritage assets:

- Planning Advice Note 2/2011: Planning and archaeology (Scottish Government 2011b);
- Onshore Wind Turbines: planning advice (Scottish Government 2014)
- Managing Change in the Historic Environment: Setting (HES 2020);
- Environmental Impact Assessment Handbook v5 (SNH & HES 2018);
- The Chartered Institute for Archaeologists (CIfA) Code of Conduct: professional ethics in archaeology (2014; Revised 2019; 2020 & 2021);
- CIfA Regulations for professional conduct (2019; Revised 2021);
- CIfA Standard and guidance for historic environment desk-based assessment (2014a – updated 2020); and
- CIfA Standard and guidance for commissioning work or providing advice on archaeology and the historic environment (2014b – updated 2020);
- DGC Council Supplementary Planning Guidance – Historic Built Environment; and
- Conservation Area Appraisals as Supplementary Planning Guidance Documents.

Study Areas

In order to assess the potential for direct impacts on cultural heritage assets resulting from the Proposed Development, the following study areas have been identified:

- A core study area, which includes all land within the Proposed Development Site, which will be subject to assessment for potential direct effects. This study area will be subject to detailed walkover survey and cultural heritage assets which may be directly impacted by the Proposed Development will be identified.
- A 1 km study area from the Proposed Development Site for the identification of all known heritage assets and known previous archaeological interventions in order to help predict whether any similar hitherto unknown archaeological remains are likely

to survive within the Proposed Development Site and thus be impacted by the Proposed Development.

Wind Development

In order to assess the potential for settings effects on cultural heritage assets resulting from the Wind Development, the following wider study areas have been identified:

- A 5 km study area for the assessment of potential effects on the settings of all designated heritage assets including Scheduled Monuments, all Listed Buildings, GDLs, Inventory Battlefields, Conservation Areas, and assets deemed to be of National Significance in the Historic Environment Record (HER).
- A 10 km study area for the assessment of potential effects on the setting of all nationally important heritage assets including Scheduled Monuments, Category A Listed Buildings, GDLs, Inventory Battlefields, Conservation Areas and assets deemed to be of National Significance in the HER.

Solar Development

In order to assess the potential for settings effects on cultural heritage assets resulting from the Solar Development, the following wider study area has been identified:

- A 2 km study area for the assessment of potential effects on the settings of all designated heritage assets including Scheduled Monuments, all Listed Buildings, GDLs, Inventory Battlefields, Conservation Areas, and assets deemed to be of National Significance in the Historic Environment Record (HER).

Assessment Methodology

The assessment will establish the historic baseline for the Proposed Development Site. Baseline data will be collated from the following sources:

- The National Record for the Historic Environment (NRHE) as held by HES;
- The Historic Environment Record (HER) as supplied by the Archaeology Service at the DGC;
- National Library of Scotland for published historic and Ordnance Survey maps;
- National Collection of Aerial Photography (NCAP) as held by HES for vertical and oblique aerial photographs;
- Published archival sources;
- Scottish Palaeoecological Archive Database (SPAD) for information regarding the palaeoecological and paleoenvironmental potential of the Proposed Development Site and surrounding landscape;
- Historic Land-Use Assessment Data for Scotland (HLAMap);
- Available client supplied data about the Proposed Development Site;
- LiDAR data and imagery as held by the Scottish Remote Sensing Portal;
- A walkover survey of the Proposed Development Site; and
- Setting assessment visits to designated assets within the ZTV with the potential to be impacted by the Proposed Development.

Matters Scoped Out

Direct impacts on cultural heritage assets outwith the Proposed Development Site will be scoped out of the assessment.

Impacts on the settings of non-designated cultural heritage assets and features, with the exception of those considered to potentially be of national importance, will be scoped out of the assessment as these assets are generally considered less sensitive to changes in their settings and are judged to be unlikely to be subject to significant settings effects. This will be confirmed with consultees.

An initial review of assets outwith a bare earth ZTV prepared for the Wind Development (Figure 4) has been undertaken to identify designated assets with key views towards them which may feature the Wind Development. No such assets have been identified within this review. Based on this ZTV, Cally GDL (centred Asset 37) and the Gatehouse of Fleet Conservation Area (centred Asset 139) would have no intervisibility with the Wind Development, however following the comments of consultees (as noted in section 5.3.1) an assessment of the impact of the Wind Development on their setting will be undertaken. Other designated assets falling outwith the Wind Development ZTV will be scoped out of further assessment.

An initial review of assets outwith the screened ZTV (Figure 5) (modelled using the Digital Surface Model (DSM), modelling buildings at 7.5m high and woodland at 15m high) prepared for the Solar Development has not identified any designated heritage assets with key views towards them which may feature the Solar Development. Therefore, designated heritage assets outwith the ZTV will be scoped out of further assessment.

Impacts on the settings of heritage assets beyond 10 km from the Wind Development will be scoped out, as most assets beyond that distance are located outwith any ZTV and will also be too distant to have their settings significantly adversely affected by the Wind Development. This will be confirmed with consultees.

5.3.3 Potential Effects

The following scoping baseline has been informed by:

- The National Record for the Historic Environment (NRHE) as held by HES including that available via Canmore;
- HER data as available online via Pastmap;
- The British Geological Survey (BGS);
- National Library of Scotland for Ordnance Survey maps; and
- A walkover survey of the previous iteration of the Wind Development area undertaken September 2020.

Each asset within the Proposed Development Site has been assigned an 'Asset No.' unique to this report, and the gazetteer (Appendix A) includes information regarding the type, period, grid reference, NRHE number, protective designation, and other descriptive information, as derived from the consulted sources. These assets are also depicted on Figure 6 Heritage Assets within the 1 km Study Area, Figure 7 Designated Heritage Assets within the 10 km of the Proposed Development Site.

Proposed Development

The Proposed Development comprises three main elements; the Wind Development; the Solar Development; and connecting Access Tracks.

Potential effects in regard to the construction of the Access Tracks will be limited to direct impacts.

Direct Impacts

Thirty-three non-designated heritage assets (Assets 67-69, 74-82, 84, 86, 88-91, 93, 100, 122, 129-138, 149 & 169) have been identified within the Proposed Development Site. These include hut circles, potential cairns and clearance cairns, buildings and enclosures. The dates of these heritage assets may range from the prehistoric to the modern era, although the majority are likely to date from the post-medieval period and reflect agricultural land use and improvement. The Loch Mannoch ASA (centred Asset 65) which encompasses an area of known Bronze Age structures also extends within the Proposed Development Site.

The First Edition Ordnance Survey (OS) map (Kirkcudbrightshire, Sheet 38 published 1852) depicts the land within the western area of the Proposed Development Site within uplands, interspersed with sheepfolds, which appear to have been built beside or on cairns. It is possible these 19th century sheepfolds were constructed on stone robbed from pre-existing cairns. Two quarries are annotated within the northern boundary. Kirkconnel Bridge and a gravel pit are labelled in the south-eastern area; and the south-eastern extent of the Proposed Development Site is annotated as "liable to flood".

The Proposed Development has the potential to directly impact on the known heritage assets within the Proposed Development Site.

Wherever possible, heritage assets would be preserved in situ and thus direct impacts would be avoided by design. If heritage assets cannot be avoided by design, a robust programme of mitigation would be required.

The British Geological Survey (BGS, 2023) has identified areas of peat within with the Wind Development and the record for Asset 68 notes the location of the asset on the edge of an extensive area of deep peat. Paleoenvironmental and archaeological remains are also known to survive buried in peat deposits. Historic and modern research in Scotland suggests that paleoenvironmental remains can survive beneath accumulations of peat and that this can help to better our understanding of vegetational and landscape development and thus anthropogenic activity in the region. As such, there is the potential for archaeological and paleoenvironmental remains to survive in the identified peat deposits within the Wind Development.

The British Geological Survey (BGS, 2023) identifies areas of alluvial deposits within Solar Development. Alluvial deposits are formed of sands, silts and gravels and are often associated with historic and existing watercourses. Archaeological and paleoenvironmental remains can survive, buried in alluvium and archaeological horizons can be masked by layers of alluvial deposits.

Settings Impacts

Two Scheduled Monuments are located within 1 km of the Proposed Development Site:

- The Scheduled cairn and stone circle at the north end of Loch Mannoch (SM1033-Asset 1), extends within 75 m of the Proposed Development Site; and
- Edgarton Mote, fort 690 m SW of Camelon Bridge (SM1119-Asset 2), the scheduled extent of which extends within the 1km study area to the north-east of the Proposed Development Site.

The cairn and stone circle (Asset 1) probably date to the Neolithic period and are situated below land that lies within the Proposed Development Site that is located to

their north. The cairn sits on a natural knoll and the stone circle on a terrace immediately above Loch Mannoich. A visit was undertaken to these monuments by AOC Archaeology Group on 23rd September 2020, which established that key characteristics of the assets' setting include: their deliberate placement within a topographical bowl to provide a segregated space; the presence of wetland to give an element of liminality; and three defined routes to the assets for those attending communal events there.

The 2km study area for the Solar Development is encompassed by the 5km study area (Figure 5). The impact of the Solar Development on the settings of designated heritage assets will be discussed in conjunction with the Wind Development below. The settings impact of the Wind Development and Solar Development will be differentiated in the EIA Report.

Six Scheduled Monuments, including three defensive sites, and three prehistoric funerary and ritual sites, which are asset types that tend to be of high sensitivity to changes in their setting, are situated within 5 km of the Proposed Development Site:

- Bargatton Farm cairn (SM1002- Asset 3), situated 1.87 km to the northwest;
- Trostie Mote (SM1133- Asset 4), situated 3.34 km to the south;
- Craig Hill fort (SM2891- Asset 5), situated 4.37 km to the northeast; and
- Kirkcormack, motte, Mayfield (SM1122- Asset 28), situated 4.65 km to the southeast;
- Cairntosh Hill cairn (SM2237- Asset 128), situated 3.25 km to the southwest; and
- Park, stone circle (SM1039- Asset 192), situated 4.58 km to the southeast of the Proposed Development Site.

A further 34 Scheduled Monuments are situated between 5 km and 10 km from the Site. The majority of these monuments are castles, forts, cairns and cross slabs dating from the prehistoric to the post-medieval periods.

The effect of the Proposed Development on the settings of these Scheduled Monuments will be assessed in the EIA report. A full assessment of the impact of the setting of the Scheduled Monuments within the ZTV will be informed by a detailed site visit, and, if needed, visualisations. The magnitude of impact and level of effect will be dependent upon the final design.

The Dumfries and Galloway HER records further non-designated assets, such as hut circles and burnt mounds, which it assesses as being of national importance within 10km of the Proposed Development Site. The impact of the Proposed Development on the settings of these assets will be considered as part of the EIA Report. A full assessment will be informed by ZTV analysis, an appraisal of each assets' setting, and if needed, a detailed site visit, and, visualisations. The magnitude of impact and level of effect will be dependent upon the final design.

The Category B Listed Kirkconnel Farmhouse and Steading (LB17118- Asset 62), is situated within meters of the southeastern Proposed Development Site boundary. Kirkconnel Farmhouse is a two-storey structure, and the steading is described as having a u-shaped plan. The Listed Buildings are thought to be contemporary and date to the late 18th or early 19th century. At present the Listed Building is surrounded by non-designed landscaped tree plantations and agricultural fields, similar in form, but less formalised compared to its depiction on the OS map (Kirkcudbrightshire, Sheet 38 published 1852). A full assessment of the impact of the setting of the Category B Listed Building will be informed by a detailed site visit, ZTV analysis and, if needed,

visualisations. The magnitude of impact and level of effect will be dependent upon the final design.

One Category A Listed Building, the late 18th century Argennan House (Asset 51) is located between 1 km and 5 km from the Proposed Development Site, c. 4.22 km southeast of the Proposed Development Site. A further nine Category B Listed Buildings and three Category C Listed Buildings are situated between 1 km and 5 km of the Proposed Development. These include the 17th – 20th century Category B Listed Laurieston Hall (LB3418-Asset 57), situated 3.68 km to the northeast of the Proposed Development Site.

Twenty-five Category A Listed Buildings are situated between 5 km and 10 km of the Proposed Development Site. These include the 16th Century Rusco Tower (LB3299-Asset 38), situated c. 5.30 km to the west; the 18th century Glenlochar Bridge (Asset 44-LB3706), situated 6.51 km to the east-northeast; and the 18th century Cally Palace Hotel (LB9854- Asset 48) situated 7.70 km to the southwest of the Proposed Development Site.

It is unlikely that the Proposed Development would have a significant, adverse effect on the settings of the Listed Buildings, however this will be considered in the EIA Report. A full assessment of the impact of the setting of the Listed Building within the ZTV will be informed by a detailed site visit, and, if needed, visualisations. The magnitude of impact and level of effect will be dependent upon the final design.

Within 10 km of the Proposed Development Site are two Conservation Areas:

- Gatehouse of Fleet (centred Asset 139), which extends 6.61 km to the southwest; and
- Kirkcudbright (centred Asset 140), which extends c. 8.64 km south.

There are three GDL's within 10 km of the Proposed Development Site:

- Cally (GDL00079 – centred Asset 37), which extends 6.35 km to the southwest;
- Threave Gardens (GDL00372- centred Asset 36), which extends c. 9.44 km east; and
- Broughton House (GDL00075- centred Asset 186), which extends c. 9.08 km south.

The Dumfries and Galloway HER lists a further 16 designed landscapes as being of regional importance.

The impact of the Proposed Development on the settings of Inventory Gardens and Designed Landscapes, Conservation Areas and designed landscapes or regional importance will be undertaken as part of the EIA Report and will be informed by ZTV analysis, detailed site visits and if needed, visualisations. The magnitude of impact and level of effect will be dependent upon the final design.

There are no World Heritage Sites or Inventory Battlefields within 10 km of the Proposed Development Site.

Cumulative Effect

The cumulative effect of two elements of the Proposed Development, the Wind Development and Solar Development, on the settings of designated heritage assets must also be considered. A detailed assessment, informed by site visits, ZTV analysis and visualisations will be undertaken. The magnitude of impact and level of effect will be dependent upon the final design.

5.3.4 Impact Assessment

The EIA Report will fully describe the baseline historic environment conditions and will assess the potential for direct impacts upon known heritage assets within the Proposed Development Site as well as outlining the potential for hitherto unknown buried remains to survive on the Proposed Development Site, and thus potentially be impacted upon.

The assessment will also consider the identified heritage assets in the outlined study areas which could be subject to potential impacts upon setting, including the potential for cumulative impacts. The EIA Report will be supported by detailed Zones of Theoretical Visibility (ZTV) which will be used to identify assets intervisible with the Proposed Development. It is envisaged that visualisations (either wireframes or photomontages) will be produced for some assets to aid in assessment of settings impacts.

The viewpoints required will be agreed in consultation with HES, the Archaeology Service at DGC, the Built Heritage Policy Officer at DGC, and the Landscape and Visual consultants. Based on a rapid review of the types of designated heritage assets within the study areas and following pre-application advice from HES and the Archaeology Service and Built Heritage Policy Officer at DGC it is anticipated that cumulative visualisations (photomontages or wirelines) will be provided for the following assets:

- SM1033 - Loch Mannoch, cairn & stone circle N end of (Asset 1);
- SM1002 - Bargatton Farm, cairn 610m S of (Asset 3);
- SM2237 - Cairntosh Hill, cairn (Asset 128);
- SM1133 - Trostrie Mote, motte (Asset 4);
- Craig Hill, fort, Laurieston (Asset 5);
- LB3299 – Category A Listed Rusco Tower (Asset 38);
- LB3309 - Category A Listed Anwoth Old Church Churchyard (Asset 55);
- LB17118- Category B Listed Kirkconnel Farmhouse and Steading (Asset 62);
- GDL00079 – Cally (centred Asset 37); and
- Gatehouse of Fleet Conservation Area (centred Asset 139) from Venniehill noted as being an important view in the Conservation Area Appraisal (DGC, 2020.)

No visualisation is proposed from Edgarton Mote, fort 690m SW of Camelon Bridge (Asset 2) at present, as it would likely be caught in the same field of view as Bargatton Farm, cairn 610m S of (Asset 3) and Craig Hill, fort, Laurieston (Asset 5). Thus, those visualisations would be illustrative of visibility from Asset 2.

The exact location and type of cultural heritage visualisations will be subject to site visits and further consultation with key consultees.

The assessment will distinguish between the term 'impact' and 'effect'. An impact is defined as a physical change to a heritage asset or its setting, whereas an effect refers to the significance of this impact. The first stage of the assessment will involve establishing the importance of the heritage asset and assessing the sensitivity of the asset to change (impact). An assessment of the impact magnitude will be made and a judgement regarding the level and significance of effect will be arrived at.

The setting assessment will be undertaken with reference to HES' Managing Change Guidance on setting and will aim to establish the current setting of the identified heritage assets, how that setting contributes to the understanding, appreciation and

experience of those assets and how the Proposed Development could impact upon this.

Cumulative effects will also be considered. The assessment of cumulative effects on heritage assets will be based upon consideration of the effects of the Proposed Development on the settings of heritage assets, in addition to the likely effects of other operational/under construction, consented and proposed (at the application stage) wind farm schemes. Cumulative effects will be considered for designated assets as identified in the 5 km and 10 km study areas.

The assessment will take into account the relative scale (i.e. size and number of turbines) of the identified developments, their distance from the affected assets, and the potential degree of visibility of the various developments from the assets. Cumulative wirelines from those assets most likely to experience significant cumulative impacts on their settings will be provided, if appropriate.

The schemes to be included in the cumulative impact assessment will be those agreed with the planning authority via consultation and will be undertaken according to the guidance in NatureScot's *Assessing the Cumulative Impact of Onshore Wind Energy Developments* and Historic Environment Scotland's *Environmental Impact Assessment Handbook*.

NPF4 indicates that development proposals affecting Scheduled Monuments will only be supported where *'significant adverse impacts on the integrity of setting of a scheduled monument are avoided'*. Significant adverse impacts on integrity of setting are judged here to relate to whether a change would adversely affect the asset's key attributes or elements of setting which contribute to an asset's significance to the extent that the setting of the asset can no longer be understood or appreciated. It is considered that 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.

In terms of effects upon the setting of heritage assets, it is considered that only those effects identified as 'significant' in EIA terms will have the potential to significantly adversely impact upon integrity of setting. Where no EIA significant effect is found it is considered that there would be no significant impact upon the integrity of an asset's setting. This is because for many assets, setting may make a limited contribution to their significance and as such changes would not significantly impact the integrity of their settings.

Where EIA significant effects are found, a detailed assessment of adverse impacts upon integrity of setting will be made. Whilst non-significant effects are unlikely to significantly impact integrity of 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 to the asset's setting will significantly impact its integrity. The assessment of adverse impact upon the integrity of an asset's setting, where required, is a qualitative one, and largely depends upon whether the impact predicted would result in a major impediment to the ability to understand or appreciate the heritage asset.

5.3.5 Questions to Consultees

- Is the proposed assessment methodology, including proposed study areas, accepted?
- Are the receptors and impacts scoped out of the assessment accepted?
- Are there any assets beyond the proposed study areas that consultees would like to see scoped into the assessment?
- Are there any assets located outwith the ZTV that consultees would like to see scoped into the assessment?
- Do the consultees agree that the proposed visualisations will be sufficient to support or inform the assessment?
- Are there any additional assets that consultees would like visualisations to be considered for?

5.4 Ecology

5.4.1 Consultation

A summary of pre application responses received in January 2021 from Dumfries and Galloway Council and relevant consultees in respect of ecological matters summarised below.

NatureScot

In terms of non-avian ecology NatureScot referred to their general pre-application and scoping advice for onshore wind farms (NatureScot 2022), which contains advice for developers on the general considerations to inform the approach to environmental impacts for all onshore wind farms.

SEPA

SEPA produced a detailed response from which a summary (provided by SEPA at the start of the detailed response) is provided below. The summary is presented in its entirety and therefore contains some issues not relevant to non-avian ecology, as follows:

- Map and assessment of all engineering activities in or impacting on the water environment including proposed buffers, details of any flood risk assessment and details of any related CAR applications.
- Map and assessment of impacts upon Groundwater Dependent Terrestrial Ecosystems and buffers.
- Map and assessment of impacts upon groundwater abstractions and buffers.
- Peat depth survey and table detailing re-use proposals.
- Map and table detailing forest removal.
- Map and site layout of borrow pits.
- Schedule of mitigation including pollution prevention measures.
- Borrow Pit Site Management Plan of pollution prevention measures.
- Map of proposed waste water drainage layout.
- Map of proposed surface water drainage layout.

- Map of proposed water abstractions including details of the proposed operating regime.
- Decommissioning statement.

The full response should be read in full. SEPA - *Town and Country Planning (Scotland) Acts: Proposed wind farm development. Lairdmannoch, Between Glengap And Laurieston, Castle Douglas. PCS/173695. 24th November 2020.*

Dumfries and Galloway Council Case Officer

The response from DGC reiterated the need cited by SEPA for NVC survey and that phase 1 and 2 peat survey will be required in tandem with a mitigation strategy within a Peat management Plan (PMP). The need for a biosecurity plan, to avoid spread of the invasive American signal crayfish *Pacifastacus leniusculus* (present within Woodhall Loch and other near-by water courses), was also noted.

It is noted that responses were received prior to implementation of National Planning Framework 4 (NPF4) which was introduced in February 2023. As such, any future Environmental Assessment Impact Report (EIAR) will adhere to NPF4 to conserve, restore, and enhance biodiversity.

Following receipt of the Scoping Opinion, detailed follow-up consultation will be undertaken with relevant consultees (DGC, NatureScot and SEPA) to agree the scope of the EIA.

5.4.2 Baseline

A desk top search, Extended Phase 1 and Protected Species surveys were carried out in 2020 based on the initial 12 turbine layout but the project was put on hold with work resuming in 2022.

Given the time that would have elapsed between 2020 surveys and the Application point (early 2024) the survey programme is being repeated in 2023.

The Proposed Development has increased in size to the east of the initial 12 turbine layout to accommodate the proposed Solar Development in addition to the Wind Development on higher ground to the west (Figure 3).

The desk top information comprised of distances of designated sites from the Proposed Development Site undertaken in 2020 was updated in 2023 given the increase in size of the Proposed Development.

2020 Desk-Top Study

The Sitelink website (NatureScot, 2020) was used to search for Statutory designated sites for non-avian ecological notified features within 10km of the Proposed Development Site however this information has been updated to reflect the 2023 Application Site Boundary as shown in section 2.2.1.

In 2020, a search of publicly available records on the NBN Atlas (<http://nbnatlas.org>) (undertaken for data held under licences CC-BY, OGL and CCO) was completed to review records from the last 10 years that have been reported within 5km radius of the Proposed Development Site (Table 4). Target species were identified as those that are either afforded specific legislative protection (i.e., of high conservation interest) or represent qualifying interests in designated sites in the wider area. On the same basis a

desk-top study was commissioned from SWSEIC. The request was for 4km from the centre of the Proposed Development Site ¹ and for up to 10km from the centre of the Site for bat species.

Table 5: Publicly available records from the last ten years within 5km of the Proposed Development Site

Species Summary	Summary of records
European otter <i>Lutra lutra</i> ¹	Two records in 2012 to the north of the Site, east of Lochenbreck Loch
Red squirrel <i>Sciurus vulgaris</i> ²	49 records mainly from Laurieston Forest
Soprano pipistrelle <i>Pipistrellus pygmaeus</i> ¹	A single record just outside of the Site to the southwest in 2015
1. Data sourced from SNH 2. Data Sourced from The Scottish Squirrel Database	

Table 6: SWSEIC records from the last ten years within 4km of the Proposed Development Site and up to 10km for bat species

Species Summary	Summary of records
Great crested newt <i>Triturus cristatus</i> ⁱ	One record from 2010 from a garden pond, 2.5 km to the east
Slow worm <i>Anguis fragilis</i> ⁱⁱ	Four records from 2009-11 from the Laurieston area. The closest is 1.1 km to the northwest
Common lizard <i>Zootoca vivipara</i> ⁱⁱ	Ten records from 2012-20 from Barstobrick and Glengap. Records are 3 km from the Proposed Development Site
Adder <i>Vipera berus</i> ^{ii, iii, iv}	Three records from 2012 from the Barstobrick and Loch Winyeaon areas. Records are between 2-3 km from the Proposed Development Site
Natterer's Bat <i>Myotis nattereri</i> ^v	Two records from 2016, 3.4 km to the north west
Pipistrelle Bat species <i>Pipistrellus</i> sp. ^{i, ii, v}	Six records from 2013-16, the closest is 2.4 km
Common Pipistrelle <i>Pipistrellus pipistrellus</i> ^{ii, v}	Four records from 2011-16, the closest is 3.3 km
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i> ^{i, ii, v}	Eight records from 2010-16, the closest is 1.2 km
Brown Long-eared Bat <i>Plecotus auratus</i> ^{ii, v}	Four records from the Laurieston area from 2009-2016, the closest is 3.4 km
Whiskered/Brandt's Bat <i>Myotis mystacinus/brandtii</i> ^v	One record from the Laurieston area from 2016, 3.4 km
Daubenton's Bat <i>Myotis daubentoniid</i> ^{ii, v}	Three records from the Laurieston area from

¹ NX6544061250

Species Summary	Summary of records
	2013-2016, the closest is 3.4 km
Lesser Noctule <i>Nyctalus leisleri</i> ^{ii, v}	Twenty-nine records from the Laurieston area from 2016, the closest is 3.4 km
Eurasian Badger <i>Meles meles</i> ^{ii, iii, vi}	Five records from 2013-17 on roads to the northwest and east, the nearest is 1.3 km to the northwest
Eurasian Red Squirrel ^{ii, vii, viii}	Eighteen records from the Lauriston Forest and Lairdmannoch estate from 2009-17, the closest is of these are 1 km from the Proposed Development Site and from 2009
Noctule Bat <i>Nyctalus noctule</i> ^{ii, v}	Nineteen records from 2016, the closest is 4.4 km
Nyctalus Bat species ^{ii, v}	Six records from 2016, the closest is 4.5 km
Nathusius's Pipistrelle <i>Pipistrellus nathusii</i> ^v	One record from 2016, 5 km from the Proposed Development Site
Data sources i - Scottish Natural Heritage ii - South West Scotland Environmental Information Centre iii - Forestry Commission (Galloway District) iv - Amphibian and Reptile Conservation v - British Trust for Ornithology vi - Biological Records Centre vii - Scottish Wildlife Trust viii - Red Squirrels in South Scotland	

Records suggest the primary potential protected species interest to focus on bats, red squirrel, and to a lesser extent, otter. Whilst a great crested newt record was returned this is within a garden pond, a habitat very different to that within the Proposed Development Site. Whilst the absence of pine marten records is noted it is acknowledged that absence of records may not constitute actual absence and could relate to an absence of effort.

2020 Field Survey

An Extended Phase 1 survey was undertaken as per published guidance for this method (JNCC, 2010) on the 8th and 9th September 2020 and results are shown on Figure 8. This covers the Wind Development and not the Solar Development; at that time the latter was not part of the Proposed Development.

The Proposed Development Site is in the uplands of Dumfries and Galloway. Loch Mannoch lies to the south-east, Glengap Forest to the west and Laurieston Forest to the north. The Proposed Development Site is dominated by marshy grassland, and, at lower elevations, wet modified bog. The terrain rises to the north/northeast with ridges of higher land orientated on a north/south axis. Habitats in this part of the Proposed Development Site are dominated by marshy grassland, semi-improved acid grassland,

bracken *Pteridium aquilinum* and dry dwarf shrub heath. Elsewhere, and particularly to the west and in the far north, wet modified bog is dominant. There are several small watercourses flowing south or south-east from the Proposed Development Site.

Two types of marshy grassland are present. The first and most widespread, is mature purple moor-grass *Molinia caerulea* grassland. Comprising the most dominant habitat on site it is interspersed with occasional heather *Calluna vulgaris* and bilberry *Vaccinium myrtillus*. Rush pasture is the second type, present in lower areas and adjacent watercourses it is dominated by smooth rush *Juncus effusus* and sharp-flowered rush *Juncus acutiflorus*. Wet modified bog is present in the west spreading through the centre to the north. The absence of sphagnum is notable. Dominated by varying quantities, heather, deergrass *Trichophorum germanicum*, purple moor-grass and occasional crossed leaved heath *Erica tetralix* localised acid flushes are also present. These are characterised by the rush species referred to above occasional sphagnum, carnation sedge *Carex panicea* and broad-leaved pondweed *Potamogeton natans*.

Blanket bog is present in the north west, differentiated by the wet modified bog which proliferates elsewhere by the increased presence of sphagnum species which included *S.palustre* and *S.capillifolium*.

Conifer seedlings from plantations to the west and north occur sporadically throughout the northern part of the Proposed Development Site.

Three small woodlands are present in the south of the Proposed Development Site. Though dominated by beech *Fagus sylvatica* conifers are present in small quantities (Douglas fir *Pseudotsuga menziesi* and larch *Larix decidua* is present at up to 10% of the canopy composition). Other canopy species included sycamore *Acer pseudoplatanus*, sessile oak *Quercus petraea* and downy birch *Betula pubescens*.

The proposed access track enters the main Proposed Development Site from the B795 Kirk Road to the north and follows an existing track for most of its length (Figure 3). Conifer plantation abuts most of the track with young broad-leaved woodland in the northern part. The southern section– before it enters the main Proposed Development Site – does not follow an existing track and it is here that it is intended to pass through conifer plantation. Several small watercourses cross the length of the proposed track.

No signs of protected species were observed. No potential roost features were seen on trees or within the woodlands referred to above. Trees within broad-leaved and mixed woodlands had smooth boles with no obvious apertures, a condition common in mature beech and sycamore as they do not as readily fissure with age as many other deciduous species. However, as a thorough check of trees was not undertaken it remains likely that there are roosting opportunities within the broad-leaved and mixed woodland, and that it may provide a foraging resource for local bat populations.

Sitka spruce *Picea sitchensis* plantation along the access track, and abutting the main Proposed Development Site, also lacked potential roosting sites.

All woodlands referred to above have high potential for red squirrel though no signs (feeding remains or potential dreys) were observed.

There is an extensive network of burns which have potential for otter and water vole *Arvicola amphibius*. A large burn on the western boundary (which partially flows through the Proposed Development Site) offers particularly good habitat for otter, given the quality of adjacent cover habitat and the likely presence of fish/amphibian prey.

No other evidence of other protected species, including pine marten *Martes martes* and badger were seen during the survey.

2023 Desk-Top Study

The Sitelink website was checked to confirm if there have been any changes or updates from 2020 as per Table 6 with regard to designated sites nominated for non-avian interests within 10km of the Proposed Development Site.

In total 11 sites were identified, eight Sites of Special Scientific Interest (SSSI), one Special Area of Conservation (SAC), one Ramsar and one National Nature Reserve

Table 7: Statutory Designated Sites

Designated Site	Designated feature	Distance from Proposed Development Site
Woodhall Loch Site of Special Scientific Interest	Freshwater habitats: Oligotrophic loch Lowland grasslands: Fen meadow Fens: Open water transition fen Invertebrates: Beetles Invertebrates: Caddisfly(<i>Anabolia brevipennis</i>)	3.7km northeast
Galloway Oakwoods Special area of Conservation	Western acidic oak woodland	4.5km west
Carstramon Wood SSSI (same site as northern section of Galloway Oakwoods SAC)	Western acidic oak woodland	4.5km west
Killiegowan Wood SSSI (same site as southern section of Galloway Oakwoods SAC)	Western acidic oak woodland	7km southwest
Threave and Carlingwark Loch SSSI	Lowland grassland Fen meadow Breeding bird assemblage Greylag goose non-breeding	7.1km east
Ardwall Hill SSSI	Upland habitats Wet woodland	7.5km west
Cainsmore of Fleet SSSI/ National Nature Reserve	Upland habitats Blanket Bog	7.6km west
River Dee (Parton to Crossmichael) SSSI	Lowland grassland Lowland acid grassland Freshwater habitats Greenland white-fronted goose non-breeding Greylag goose non-breeding Whooper swan (<i>Cygnus cygnus</i>) non breeding Invertebrates Dragonfly assemblage	7.7km northeast
Loch Ken and River Dee Marshes Ramsar site	Swamp Fen Grassland Carr woodland Semi-natural freshwater system Greenland white-fronted geese Anser <i>albifrons flavirostris</i>	7.8km northeast

Designated Site	Designated feature	Distance from Proposed Development Site
	Icelandic greylag geese Anser anser. Nationally important aquatic plants and invertebrates	
Airds of Kells Wood SSSI	Upland oak woodland Upland mixed ash woodland	7.9km north
Skyreburn Grasslands SSSI	Lowland neutral grassland Biological: Fens: Fen meadow	9.9km west

Whilst it is considered unlikely that significant impacts would occur on statutory designated sites, due to their distance from the Proposed Development Site, this will be fully assessed in the EIAR.

Non-statutory sites up to 4km from the Proposed Development Site were considered. Results from a desk top study commissioned from South West Scotland Environmental Information Centre revealed one site, the Culcaigrie & Trostrie Lochs Local Wildlife Site, approximately 3km to the south. The site is designated for its fen, willow carr and marshy grassland. Whilst a hydrological pathway cannot be ruled out, negative effects are considered unlikely, even in the absence of standard mitigation measures, given the distance of the LWS from the Proposed Development. A potential impact pathway would be via Loch Mannoch which is to the east of the higher ground on which the Proposed Development is based, it is therefore considered likely that any negative effect (should they occur) would be contained up-stream of the LWS.

A new local records search will be requested from SWSEIC to validate the exercise undertaken in 2020.

2023 Field Survey

Extended Phase 1 and protected species surveys have begun focusing on the proposed Solar Development area. This area is agricultural lowland/upland fringe, dominated by pasture fields with a number of broad-leaved trees and ponds and the character differs from the upland location for the proposed wind farm.

Bat roost potential has been identified within some trees within the current Zone of Influence of solar area as was one pond within the Application Boundary with potential for great crested newt. The pond is located at NX 67563 60433 and a habitat suitability index survey was carried out which concluded poor suitability for GCN (score 0.40) and this pond will be scoped out in relation to potential GCN effects in any future EIAR. It is noted that several ponds are present in the vicinity but outwith the Application Boundary (to which at the time of writing there is no access). Where these ponds may fall within the Zone of Influence of proposed infrastructure which as per English Nature 2001, is considered to be 500m, efforts will be made to access these areas. The issue of GCN will be included within the future assessment.

5.4.3 Further Surveys

Based on the findings of the Extended Phase 1 Habitats assessment, further characterisation work is proposed to determine the ecological baseline. This includes:

- A National Vegetation Classification (NVC) survey of habitats within 250m of Proposed Development Site infrastructure where excavations deeper than 1m are required and where the habitat is particularly sensitive to hydrological disturbance

or indicates a groundwater-dependant terrestrial ecosystem (GWDTE) may be present;

- Peat probing and assessment to include phase 1 probing with habitat condition assessment and phase 2 probing/coring to inform detailed design stage;
- Otter/water vole/ along watercourses within 250m of infrastructure;
- Bat surveys in accordance with NatureScot 2021 guidance (3 x ten nights of static detectors with one detector per turbine locations; surveys to be carried out in April/May, June/July and August/September);
- Bat emergence/return as required pending results of a ground-based preliminary bat roost assessment; and
- Red squirrel surveys in accordance with NatureScot 2020 guidance where proposed works are within 50m of mature woodland and intended within the breeding season (February – September inclusive).

The ecology assessment will focus on the impacts of construction and operation of the Proposed Development upon those ecological features identified during the review of desk-based information and field surveys.

Impacts upon the following features will be assessed:

- Designated sites: including direct effects (i.e., derived from land-take or disturbance to habitats and/or protected species) and indirect effects: (i.e., changes caused by impacts to supporting systems such as groundwater or over land flow);
- Terrestrial habitats: including direct effects (i.e., derived from land-take) and indirect effects: (i.e., changes caused by impacts to supporting systems such as groundwater or over land flow);
- Aquatic habitats: impacts are limited to the ecological effects of changes in water conditions through potential pollution impacts; and
- Protected species: including direct effects (i.e., loss of life as a result of the Proposed Development; loss of key habitat; displacement from key habitat; barrier impacts preventing movement to/from key habitats; and general disturbance) and indirect effects (i.e. loss/changes of/to food resources; population fragmentation; degradation of key habitat e.g. as a result of pollution).

The assessment will also consider potential cumulative effects arising from the addition of the Proposed Development with other existing developments.

Proposed Receptors Scoped Out For Further Assessment

It is proposed that effects on migratory fish are scoped out of the assessment at this point. Watercourses which pass into the upland proposed wind farm area are small (>1m) and considered unlikely to support fish populations. In addition, the dam at NX 66586 60916 on the eastern side of Loch Mannocho is considered impassable (as defined by the Scotland Environment website (accessed 23/05/23)) and as a result, the presence of migratory fish within the upland area of the Proposed Development Site is considered unlikely. Whilst they could be present passing through the lowland solar section of the Proposed Development Site, impact pathways are limited as the infrastructure footprint is reduced and there is not the gradient from which to manage potential sedimentation. Nonetheless best practice will be employed as well as further mitigation to manage potential impact pathways to all aquatic receptors. This mitigation will be fully explored in the assessment.

5.4.4 Potential Effects

Both wind and solar energy developments can influence ecology both directly through habitat loss and indirectly through disturbance or displacement effects on habitats and species. The main potential effects would be from the following activities:

- Permanent loss of habitat from construction of permanent components (tracks and turbine foundations);
- Temporary loss of habitat from construction of temporary components (construction compound);
- Modification of habitats due to hydrological change;
- Direct impacts such as collision risk of bats;
- Accidental mortality due to construction activities;
- Fragmentation of species ranges or habitats;
- Pollution of the aquatic environment; and
- Disturbance from site traffic, turbine operation, and increased human presence.

The extent of the disturbance and potential effects will be dependent upon a variety of factors including the location of the works, timing, duration and whether permanent or temporary.

5.4.5 Impact Assessment

The impact assessment will be based on the Guidelines for Ecological Impact Assessment in the UK and Ireland of the Chartered Institute of Ecology and Environmental Management, CIEEM, 2018. To ensure that appropriate mitigation measures are adopted the assessment will consider the methods proposed for construction of roads and infrastructure and make recommendations as appropriate.

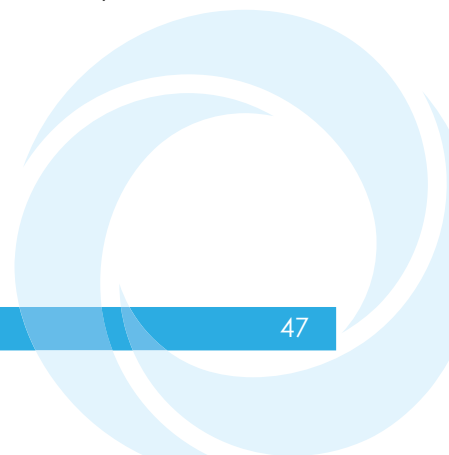
Following the Pre-Application responses noted in section 5.4.1 and based on available information, there will be a focus within the Ecology EIAR on the following themes, albeit not limited to:

- GWDTE, mitigation and where appropriate, enhancement;
- Peat protection and restoration; and
- Pollution prevention to the aquatic environment (includes Biosecurity).

All individual habitat and species reports will be provided as separate technical appendices to the final EIA Report submission.

5.4.6 Questions for Consultees

- Please confirm that the scope set out above, and that based on current information, the surveys cited are adequate to inform future assessment and where receptors are identified as being scoped out of future assessment you are content with these.



5.5 Ornithology

5.5.1 Consultation

Initial consultation was undertaken with respect to feasibility review of the Wind Development in 2019 to identify any features of the Laughenghie and Airie Hills Site of Special Scientific Interest; both Royal Society of Protection of Birds and Scottish Natural Heritage (now NatureScot (NS)) were initially consulted about the qualifying features of the SSSI with a view to determining their proximity to the Wind Development. Information received back is confidential but has been considered during the survey planning stage.

A summary of pre application responses received in January 2021 from Dumfries and Galloway Council and relevant consultees in respect of ornithological matters is summarised below.

Pre-application consultation – NatureScot

The pre-application consultation response from NatureScot noted the following sensitive receptors:

- The Red kite *Milvus milvus* feeding station at Lauriston (less than 4 km from the Proposed Development Site boundary at that time), meaning the Proposed Development Site occurred in the area containing part of the Dumfries and Galloway Red kite population;
- A pair of Golden eagle within foraging distance of the Proposed Wind Development;
- The proximity to the Laughenghie and Airie Hills SSSI with important wintering Hen harriers *Circus cyaneus* and breeding bird assemblage; and
- Potential for connection with Loch Ken and River Dee Marshes Special Protection Area, designated for its populations of Greylag goose *Anser anser* and Greenland White-fronted goose *Anser albifrons*.

5.5.2 Surveys

Ornithology surveys commenced in September 2019 and were completed by August 2021. These are summarised below.

Vantage points surveys

Vantage point surveys (VPs) were carried out from two VPs:

- VP 1 located at 264897, 561590 and on a bearing of 0°; and
- VP2 located at 264568 562312 and on a bearing of 165°.

Viewsheds for the VPs are shown in Figure 9.

Vantage point surveys followed NatureScot guidance (NatureScot, 2017), with on average a minimum of six hours of survey per month from each VP. Surveys were not carried out simultaneously and were carried out in suitable conditions. Table 7 shows the survey hours.

Table 8: Summary of hours of VP surveys

	VP1		VP2	
	Yr 1 (2019 – 2020)	Year 2 (2020-2021)	Yr 1 (2019 – 2020)	Year 2 (2020-2021)
Sep	6	6	6	6
Oct	9	6	9	6
Nov	9	6	9	6
Dec	9	6	9	3
Jan	9	6	9	9
Feb	6.75	6	9	6
Mar	14.25	6	12	6
Apr	6	6	6	6
May	6	6	6	6
Jun	6	6	6	6
Jul	6	6	6	6
Aug	6	6	6	3
Total	93	66	93	63

Additional hours were carried out in winter 2019/20 due to the presence of the Laughenghie and Airie Hills Site of Special Scientific Interest (SSSI) and potential for Hen harrier *Circus cyaneus* associated with that SSSI to be observed over the Proposed Development. The additional surveys were not continued in the winter of 2020/21 due to the absence of records of this species.

Breeding bird surveys

In addition to vantage point surveys, the following breeding season surveys were carried out:

- Breeding bird surveys (using a modified Brown & Shepherd) (Brown, 1993), modified in line with NatureScot (2017)
 - In year 1, four visits were carried out between 7th May 2020 and 21st July 2020. The survey area was based on the turbines plus a 500 m buffer. Forested areas were not surveyed as per NatureScot guidance
 - In year 2, four visits were carried out between 21st April 2021 and 21st July 2021. The survey area was the same as in 2020.
- Breeding raptor surveys based upon Hardey (Hardey, 2013)
 - In year 1, four visits were carried out between the 6th of May and the 31st of July covering an area 2 km from the turbines, where access was available and using public access where landowner access was not granted
 - In year 2, four visits were carried out between the 28th of April and the 23rd of July using the same survey area as for year 1
- Black grouse *Lyrurus tetralix* surveys as described in Gilbert (Gilbert, 1998)
 - In year 1, Following a habitat assessment carried out across May, dawn surveys were undertaken on the 29th of May
 - In year 2 surveys were undertaken at dawn between the 14th – 29th May
- Nightjar *Caprimulgus europaeus* surveys (following Gilbert)

- In year one, two visits were undertaken in July; two staff were used on each visit and the survey area was prioritised over the northern and western part of the Proposed Development Site, adjacent and close to the forestry on the Proposed Development boundary
- In year two, two visits were undertaken, one in June and one in July.

Limitations to survey work

Covid restrictions did interfere with survey work in 2020, meaning that walkover surveys started later than would be desired due to travel restrictions and the need to identify locally based surveyors.

5.5.3 Further work

While all ornithology surveys were initially completed in the period 2019 – 2021, further breeding bird surveys, based upon Brown and Shepherd, but modified in line with NatureScot (2017) have been commissioned to cover the Solar Development, which was not included in the survey area previously. This will consist of four visits between April – July 2023 and work is underway.

Additionally a full desk study and further data consultation will be carried out with data to be requested from:

- Dumfries and Galloway Raptor Study Group;
- Royal Society for Protection of Birds; and
- South West Scotland Environmental Information Centre.

5.5.4 Baseline

Designated sites

A search was carried out for statutory sites (Special Protection Areas (SPAs), Ramsars and SSSIs) within 10 km of the Proposed Development and up to 20 km. The results of this search are shown in Table 8 and Figure 10.

Table 9: Designated sites

Site	Designation	Distance from Proposed Development	Ornithological qualifying species	Notes
Loch Ken and River Dee Marshes	SPA/Ramsar	5.2 km	Greenland White-fronted goose <i>Anser albifrons</i> Greylag goose <i>Anser anser</i>	
Solway Firth	SPA	13.7 km	The SPA is designated for 29 qualifying features; however only Barnacle goose <i>Branta leucopsis</i> and Pink-footed goose <i>Anser brachyrhynchus</i>	

Site	Designation	Distance from Proposed Development	Ornithological qualifying species	Notes
			have the potential to range as far as the Proposed Development	
Laughenghie and Airie Hills	SSSI	0.5 km	Breeding bird assemblage Non-breeding Hen harrier	
River Dee (Parton to Crossmichael)	SSSI	6.7 km	Greenland White-fronted goose Greylag goose	Underlies the Loch Ken and River Dee Marshes SPA
Threave and Carlinwork Loch	SSSI	5.2 km	Breeding bird assemblage Greylag goose	Underlies the Loch Ken and River Dee Marshes SPA

Of these sites it is proposed that impacts on the Solway Firth SPA will not be considered, given the inland nature of the Proposed Development and the absence of Barnacle geese and very limited occurrence of Pink-footed goose (Table 9). There also were no Greenland White-fronted goose records, and only a few Greylag goose records, but because the Proposed Development is closer to the Loch Ken and River Dee Marshes SPA/Ramsar impacts will be considered.

Table 9 shows the results from the vantage point surveys. While the number of flights was low for all species except Red kite, for Golden plover *Pluvialis apricaria*, Greylag goose and Pink-footed goose flocks of birds were observed which increased the bird seconds observed.

Table 10: Vantage point survey results

Species	Min No. of Birds	Max No. of Birds	Mean No. of Birds	No. of Flights	Total Bird Seconds	At Risk Bird Seconds
Black grouse	1	1	1	1	31	31
Golden plover	35	60	44.67	3	37,526	32,726
Goshawk	1	1	1	1	330	0
Greylag goose	2	41	15.50	6	18,541	14,220
Hen harrier	1	1	1	1	20	0
Herring gull	1	1	1	1	141	141
Kestrel	1	1	1	3	226	174
Lesser Black-backed gull	1	3	1.50	4	787	157
Merlin	1	1	1	2	45	0
Mute swan	1	1	1	1	15	15
Pink-footed goose	1	130	43.60	5	20,999	106
Red kite	1	4	1.12	284	55,411	42,852

Species	Min No. of Birds	Max No. of Birds	Mean No. of Birds	No. of Flights	Total Bird Seconds	At Risk Bird Seconds
Snipe	1	1	1	1	79	79

It is proposed that collision risk modelling, (following NatureScot guidance (NatureScot, 2000), including the most recent guidance on avoidance rates (NatureScot, 2018)) will be carried out for the following species:

- Golden plover;
- Greylag goose; and
- Red kite.

In addition, because of the large levels of flight activity recorded for Red kite, this will likely translate into a relatively high level of collision risk for this species, therefore modelling of population viability will be undertaken if the outcome of collision risk modelling suggests it is required. It is known that this species, due to the population dynamics of a rapidly expanding population can support a high level of collision risk (Atmos Consulting , 2017).

5.5.5 Potential Effects

The Proposed Development has the potential to impact on ornithology receptors through the following:

- Direct loss and fragmentation of permanent habitat;
- Indirect loss of bird habitat due to the displacement of birds (disturbance and/or displacement) by construction and operation of the wind farm;
- Accidental mortality due to construction activities;
- Collision mortality;
- Barrier effects to migratory species; and,
- Effects from decommissioning.

5.5.6 Impact Assessment

Impact assessment will follow guidance produced by NatureScot (e.g. (NatureScot, 2017) (NatureScot, 2016)) and also Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).

A full description of the surveys carried out and the results of those surveys will be provided in a Technical Appendix.

The Ornithology Chapter will describe the baseline, evaluate the value of the ornithological receptors, and for those which are at risk of significant effects assess the impacts of the Proposed Development on those receptors. Following best practice, this assessment will take into account mitigation and best practice enhancements which will also be detailed in the Chapter.

A cumulative assessment will be carried out. This will consider other wind farm developments in the same Natural Heritage Zone (NHZ 19: Western Southern Uplands and Inner Solway) which have three or more turbines and will look to assess the cumulative impacts of displacement, disturbance, habitat loss and additional collision risk mortality using a modified approach to that set out in guidance (NatureScot, 2012). This would aim to assess quantitative effects of additional collision mortality (if appropriate) and qualitative effects of other effects.

5.5.7 Questions to Consultees

- Do the consultees consider that the effort in the further work section 5.5.3 is appropriate to describe the baseline and can they identify any further work which needs to be undertaken to describe the baseline?
- Do the consultees consider that a population viability model is required for Red kite in this instance?
- Do they consider that collision risk modelling should be carried out for any other species shown in Table 9?
- Are consultees aware of any other developments which should be included in the cumulative assessment?

5.6 Hydrology, Geology and Hydrogeology (including Peat)

5.6.1 Consultation

A summary of pre application responses received in January 2021 from Dumfries and Galloway Council and relevant consultees in respect of hydrological matters is summarised below.

Scottish Environment Protection Agency (SEPA)

SEPA provided guidance on what information should be submitted with the EIA Report including maps and assessment of engineering activities in or impacts on the water environment, GWDTE, groundwater abstractions, peat depth survey and re use proposals, forestry removal, borrow pits, schedule of mitigation, waste and surface water drainage and decommissioning statement.

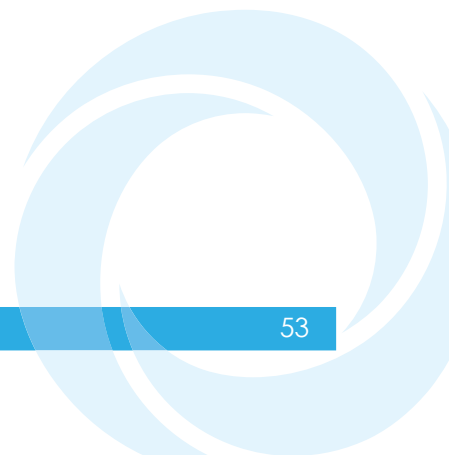
The feedback noted the likely presence of Class 1 and 2 peat and that a peat depth survey should be provided with focus on areas where infrastructure is planned and also to map any areas of deep peat found. Excavation of deep peat should be avoided, for example, by micro-siting turbines or use of floating roads. Where this isn't possible, mitigation must be outlined. In this case, where much of the Proposed Development Site is on peat, we expect the application to be supported by a comprehensive Proposed Development Site-specific Peat Management Plan (PMP).

Scottish Water

Scottish Water noted no objection from the information provided however advised that any potential conflicts with Scottish Water assets should be assessed. The feedback also indicated that the Proposed Development Site is within a Drinking Water Protected Area and advised measured for incident control.

DGC Flood Risk Management Team

Noted no objection from the information provided.



DGC Pre application Response

Noted the likely presence of Class 1 and 2 peat and that a peat depth survey should be undertaken and excavation of deep peat avoided, to be support by a Peat Management Plan (PMP).

5.6.2 Methodology and Guidance

Assessment of effects in relation to hydrology, geology and hydrogeology (including peat) will be undertaken in line with current guidance and best practice. The following legislation, guidance and published data sources will be used to inform the assessment including:

- Environmental Protection Act 1990;
- Environment Act 1995;
- EC Water Framework Directive (2000/60/EC);
- EC Freshwater Fish Directive (2006/44/EC);
- The Flood Risk Management (Scotland) Act 2009;
- Water Environment and Water Services (Scotland) Act 2003 (WEWS Act);
- The Water Environment (Controlled Activities) (Scotland) Regulations, 2011 (CAR);
- Private Water Supplies (Scotland) Regulations 2006;
- Pollution Prevention and Control (Scotland) Regulations 2000;
- Environmental Liability (Scotland) Regulations 2009;
- Forestry Commission (2017). The UK Forestry Standard.
- Forestry Commission (2019). Managing forest operations to protect the water environment. Forestry Commission Practice Guide
- Guidance for Pollution Prevention (GPP, and older PPG), SEPA:
 - GPP 1: Understanding your environmental responsibilities - good environmental practices, (2020);
 - GPP 2: Above ground oil storage tanks, (2018);
 - PPG 3 Use and Design of Oil Separators in Surface Water Drainage Systems, (2006);
 - GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer (2017);
 - GPP 5 Works and maintenance in or near water in or water, (2018);
 - PPG 6 Working at construction and demolition Sites (2012);
 - PPG7 Safe storage - The safe operation of refuelling facilities (2011);
 - GPP 8: Safe storage and disposal of used oils, (2017);
 - GPP 13 Vehicle washing and cleaning, (2017);
 - GPP 21: Pollution incident response planning, (2021);
 - GPP 22: Dealing with spills, (2018); and
 - PPG 23 Maintenance of structures replaced by GPP 5, Works and maintenance.
- SEPA Guidance Note 31, Version 3, 11/09/2017, Land Use Planning System: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions;
- SEPA (2022), ;CAR Practical Guide v9.1;

- SEPA Position Statement (WAT-PS-10-01) on groundwater assessment criteria for pollution control;
- SEPA Supporting Guidance (WAT-SG-53) Environmental Quality Standards and Standards for Discharges to Surface Waters (Feb 2018);
- SEPA, Groundwater protection policy for Scotland;
- SEPA, Policy regarding culverts;
- SEPA, Regulatory Position Statement – Developments on Peat (2010);
- Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland; and
- The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013

5.6.3 Baseline

Watercourses and Surface Water

The Proposed Development Site features numerous watercourses, the area to the south and south east contains a number of watercourses and lochans, the most notable of which is Loch Mannoch which receives the Anstool Burn from the north and the Glengap Burn from the south.

According to the British Geological Survey 1:625,000 Aquifer Classification map, the entire aquifers within the proposed development are defined as low productivity.

The SEPA Flood Map shows that Loch Mannoch and its northern watercourses are at high risk of flooding (1 in 10 or once every ten years).

The location of watercourses will be taken into consideration during the layout design in relation to proximity of infrastructure and the requirement for watercourse crossings.

Geology and Peat

Examination of bedrock geology mapping shows that the Proposed Development Site is underlain by Cairnharrow Formation – Wacke and Kirkmaiden Formation – Wacke described as Thin- to medium-bedded greywacke with variable proportion of interbedded silty and greywackes with mudstone interbeds.

Superficial geology mapping notes that the Proposed Development Site has pockets of silt, sand and gravel with potential pockets of peat.

Review of NatureScot's Carbon and Peatlands map illustrates the likely presence of Class 1 and Class 2 peatlands within the majority of the Wind Development site with Class 3 and 5 to the north western area of the Proposed Development Site.

Class 1 and Class 2 peatlands are defined as nationally important carbon-rich soils, deep peat and priority peatland habitat and are of high conservation value.

Initial phase 1 peat probing has already been undertaken based on the previous layout iteration, results of this can be seen in Figure 11. Figure 11 illustrates that the majority of the Proposed Development Site has <0.5m peat depths present, there are pockets (in the centre and to the north west) of deeper pockets of peat ranging from 0.5m > 3m.

5.6.4 Proposed Survey Programme

Peat Depth Survey

Initial phase 1 peat probing will be undertaken on the remainder of the Proposed Development Site where data hasn't already been collected. The peat depth investigation will be undertaken on a 100m grid which will be undertaken across the whole Proposed Development Site boundary.

Further, infrastructure specific peat surveys will then be undertaken in line with appropriate guidance (Scottish Government et al, 2017). These will include:

- Peat depth probing along proposed tracks at 50m intervals with 10m right-angled offsets;
- Peat depth probing on a 20m by 20m grid basis around the centre of each proposed turbine or other infrastructure base. Should highly variable peat depths be encountered using this resolution then additional depth probes will be undertaken to assess variability; and
- Peat coring of up to 4% of the peat locations to confirm the nature of the peat with respect to saturation and reuse characteristics, the substrate upon which the peat rests and samples for analysis of TOC, Bulk Density, Moisture Content and Dry Density.

Hydrology, Geology and Hydrogeology

A hydrological site walkover will be undertaken to identify onsite hydrological constraints.

Groundwater Dependant Terrestrial Ecosystems (GWDTE)

GWDTE are protected under the Water Framework Directive and therefore the layout and design of the development will seek to avoid impact on such areas where possible.

Excavations and other construction works can disrupt groundwater flow and impact on existing groundwater abstractions.

Water Supplies, Discharges and Abstractions, and Services

DGC private water supplies database will be reviewed to identify potential effects. As individual supplies may be missing, an investigation to identify other private water supplies, including pipework, which are in hydraulic connectivity with the development will be undertaken.

Flood Risk

A request for flood information will be submitted to the SEPA and a site walkover will be undertaken. The risk of flooding from all known/identified sources will be assessed, and flood risk mitigation measures developed as required.

Drainage Impact Assessment

The existing surface water runoff regime and runoff rates will be assessed, as will the options for disposal of surface water from the Proposed Development Site. Surface water discharge rates from the Proposed Development Site will be calculated. A strategy for the management of surface water runoff/overland flow from the Proposed

Development Site will be prepared, to include attenuation storage volumes, a preliminary drainage layout, and an illustrative maintenance schedule.

5.6.5 Potential Effects

Potential effects of the Proposed Development on hydrological, geological and hydrogeological receptors include:

- Potential effects on the surface water and groundwater environment for water quality, water quantity and flow;
- Potential effects on flood risk and likely changes to existing flood risk patterns;
- Potential effects on soil and geology across the Proposed Development Site, including peat and peat slide hazard risk; and
- Potential effects on GWDTE.

In addition, there is the potential for effects on abstractions associated with private water supplies.

5.6.6 Impact Assessment

The impact assessment will include the potential effects on surface water and groundwater particularly during the construction phase of the Proposed Development. Where appropriate mitigation including standard good practice measures (e.g. silt fences) will be considered along with Proposed Development Site-specific mitigation as appropriate.

Surface Water Quality

The watercourses and lochs / reservoirs are sensitive and vulnerable to sediment release and pollution. The assessment will detail their relative sensitivities and identify those activities associated with the Proposed Development with the potential to result in significant effects.

As part of the design process, a separation distance between turbines and water bodies of a minimum 50m will be sought. Where this minimum buffer cannot be achieved, a detailed assessment will be undertaken including a review of engineering design and construction methods to determine what mitigation measures are required.

Impacts on the existing drainage network and potential for erosion to existing watercourses will be assessed with mitigation potentially including design of tracks and hardstandings to manage run off sustainably and drainage design to restricted uncontrolled runoff.

The Proposed Development will be designed to minimise watercourse crossings which will be designed as traditional style bridges or bottomless arched culverts.

GWDTE

The Proposed Development design will seek to avoid GWDTEs where possible through an iterative process informed by the results of the surveys. If it is not practical to completely avoid all GWDTEs, suggested mitigation measures will be developed by determining how they are fed and how their supporting water flow can be maintained.

Peat

Detailed information and plans for peat management will be included, either as part of the Schedule of Mitigation or as a Peat Management Plan within a Construction Environmental Management Plan(s). The plan will address:

- Peat conditions on site;
- Peat depth and habitats (depicted on a detailed map of peat depths with all the built elements (including peat storage areas) overlain);
- Avoidance and minimisation measures to reduce disturbance to peat and consequential release of CO₂;
- Estimates of the quantities of acrotelmic, catotelmic and amorphous peat potentially excavated for each element of the Proposed Development;
- Proposals for re-use of excavated peat in infrastructure and in restoration and rehabilitation, including peat balance;
- Management of peat during construction including proposed phasing of soil stripping, temporary storage and monitoring of works affecting peat by an Environmental Clerk of Works (ECoW);
- Mitigation measures to minimise disturbance and impacts on peat; and
- Revised peat depth contour plan with all built elements overlain

The assessment will also look for opportunities for habitat restoration or improvements to help compensate for the peat disturbance as a result of the Proposed Development.

These may utilise areas of the site which are not being developed, and possibly other peatland sites. Proposed restoration and improvements would be considered as part of any Habitat Management Plan. A peat slide hazard risk assessment will also be carried out.

Water Supplies, Discharges and Abstractions, and Services

Identified existing groundwater abstractions will be included in the water features map. Particular attention will be paid to those with a 100m radius of all excavations shallower than 1m and outwith 250m of all excavations deeper than 1m.

Should potentially impacted private supplies be identified, measures to prevent contamination or physical disruption will be identified.

5.6.7 Questions to Consultees

- Are there any additional sources of baseline information which should be referred to in order to inform the appraisal of effects on hydrology, geology, hydrogeology and water resources?
- Is the proposed survey effort sufficient and the methodology appropriate?
- Are there any other potential effects that should be considered?

5.7 Transport and Access

The section sets out the proposed approach to the assessment of potentially significant effects on traffic and transport.

5.7.1 Consultation

A summary of pre application responses received in January 2021 from Dumfries and Galloway Council and relevant consultees in respect of transport matters is summarised below.

DCG Pre application Response

DGC Road Planning Team noted no objection from the information provided however provided detailed comments on information that should be included as part of any development proposals. In summary, this includes but is not limited to:

- Confirmation of access route arrangements and detailed proposals for any Proposed Development Site accesses;
- Details in respect of the anticipated trip generation by construction traffic or predicted number of AILs. On minor roads, the short-term impact of temporary construction traffic will be significant;
- Full extent of any proposed off-site road accommodation and mitigation works on public roads including passing place provision, carriageway strengthening, widening and alterations to road boundaries all along any proposed access routes;
- All accommodation works should be supported by swept paths;
- Any future application/EIA Report include reference to the requirements for a Traffic Management Plan that should include a programme of projected traffic movements associated with the project by programme month and vehicle type, details of all proposed mitigation measures, agreed and excluded access routes by vehicle type, enforcement measures (driver code of conduct and disciplinary action) and details of measures that will be implemented to ensure that no stacking of delivery vehicles occur on any part of the public road network;
- Any future application/EIA Report should include worst-case (100%) details of tonnages and vehicle movements so that the potential impact of importing aggregate from elsewhere via the public road network be assessed;
- Abnormal Loads require to be assessed on an individual basis and proposed axle load configurations should be supplied and agreed at earliest opportunity. Routes leading to the Proposed Development Site cross a number of bridges/structures, some of which may be unsuitable for heavy HGVs and larger AILs, and that have limitations on safe axle loadings and/or restricted parapet widths including:
 - Newbridge B795/20;
 - Barend B795/10/C10;
 - Glenlochar B795/10; and
 - Various on the A713.

5.7.2 Methodology and Guidance

Assessment of effects in relation to Traffic and Transport will be undertaken in line with current guidance and best practice. The following legislation, guidance and published data sources will be used to inform the assessment including:

- Guidelines for the Environmental Assessment of Road Traffic (IEMA, 2005a);

- Transport Assessment Guidance (Scottish Government, 2012)
- Design Manual for Roads and Bridges TA 46 and 79, (HA, SOED, TWO, DoE(NI)) 1997)
- Designing Streets (Scottish Government, 2010);
- Scottish Planning Policy (Scottish Government, 2017) paragraphs 269-291 on Promoting Sustainable Transport and Active Travel; and
- National Roads Development Guide (SCOTS 2017).

5.7.3 Baseline and Potential Effects

From an initial review of the surrounding road network the most viable route for delivering components to the Proposed Development is likely to be via the A75 and onto the A713 at Castle Douglas. From here components will travel along the B795. The final route to site is still to be assessed as part of the Proposed Development but will either take the A762 and access site directly from the east or continue along the B795 to the existing forestry tracks and access the site from the North.

Alternative routes will be considered as the project develops and further baseline conditions and assessments are undertaken.

Baseline traffic flow information would be obtained from existing datasets augmented by new surveys as appropriate.

Figure 12 shows the initial route options that the Applicant is considering.

5.7.4 Impact Assessment

The effects would be identified and quantified in terms of significance and mitigation measures identified where necessary as part of the assessment process. Discussion of the detailed scope of the assessment would be discussed with DGC at the outset to agree the study area, sensitive receptors and baseline datasets.

Details of the number, size and weight of deliveries to Proposed Development would be identified along with a potential activity schedule for deliveries. This information would be used to identify the potential number of daily, weekly and total delivery numbers for the Proposed Development.

An estimate of construction employee trips would also be undertaken to gain an understanding of total trips on and off the construction site.

The distribution and assignment of these trips would then be estimated based on the trip origins and the available route options. From this information, it will be possible to assess the percentage impact of generated development trips on the existing road network.

Where the percentage impacts exceed the IEMA Guideline thresholds for detailed assessment, a full assessment of environmental effects would be undertaken. This would include an assessment of severance, accidents & safety, wear and tear, driver delay, pedestrian amenity, dust and dirt etc.

A matrix approach would be used (combining the magnitude of effect and receptor sensitivity) to identify the significance of the effect. Where effects are identified as being significant (in accordance with the EIA regulations), mitigation will be proposed, and a re-assessment of the effects undertaken.

A cumulative assessment would be included if there are other committed construction projects in the area that are likely to share the access routes.

5.7.5 Questions to Consultees

- Is the proposed scope and methodology acceptable?

5.8 Noise

5.8.1 Consultation

A summary of pre application responses received in January 2021 from Dumfries and Galloway Council and relevant consultees in respect of noise matters is summarised below.

It should be noted that noise guidance remains unchanged since the previous pre-application consultation and therefore it is likely that the same comments would apply.

DGC

DCG noted that Policy IN1 of PDP2 and section E of the Supplementary Guidance on *Wind Energy Development* requires an assessment of detrimental impacts on communities, individual dwellings, residential and local amenity, from (amongst other potential impacts) noise.

It is stated that, for all large and medium scale turbines, operational noise should be assessed in accordance with ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*, and the associated Institute of Acoustics guidance. It is suggested that the cumulative impact and noise sensitive properties should be agreed with DGC, and that background noise monitoring should be undertaken at the nearest noise sensitive receptors to the proposed turbines.

The response confirms that DGC would expect that a noise assessment is presented in the EIA.

5.8.2 Methodology & Guidance

The methodology by which a baseline/background noise survey will be undertaken, and the subsequent assessment, will be agreed with representatives of DGC prior to any works relating to noise commencing.

Operational noise associated with the Wind Development will be assessed in accordance with the requirements of ETSU-R-97, *The Assessment of Rating of Noise from Wind Farms* (DTI, 1996) and incorporating the best practice described within the Institute of Acoustics, *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (GPG) (IOA, 2014), as referenced within the *Onshore Wind Policy Statement 2022* (Scottish Government, 2022).

If predicted operational noise levels exceed the lower limiting values set out in ETSU-R-97, then it is likely that a baseline noise survey will be required to allow for the derivation of appropriate noise limits. Background noise levels obtained at a number of properties will be correlated with the wind speed experienced on-site and a best fit curve will be applied to the results. The derived prevailing noise levels, over a range of wind speeds,

will be used to determine daytime and night-time noise limits as per the requirements of ETSU-R-97 and the GPG referenced above.

Predictions of the noise levels resulting from the Wind Development, also over a range of wind speeds, can then be compared with the derived limits.

Construction and decommissioning noise impacts will be discussed with reference to relevant guidance in the form of BS 5228 *Code of practice for noise and vibration control on construction and open sites* (BSI, 2014).

Operational noise from the Solar Development (and any associated on-site battery energy storage systems) will be assessed in line with BS 4142+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BSI, 2019).

It is considered that if the noise levels are acceptable as assessed in line with the above guidance documents, then the requirements of the National Planning Framework 4 (Scottish Government 2023) will be met which seeks to ensure that noise impacts are suitably addressed.

If baseline measurements are required, or the scope of the assessment changes from that set out in this chapter, the relevant details of the assessment methodology will be discussed and agreed with the Environmental Health Department of Dumfries and Galloway Council.

5.8.3 Baseline

A small number of noise sensitive properties (dwellings) surround the Proposed Development. The local area is rural in nature and existing background noise levels are expected to be low. The main sources of noise in the existing environment at the dwellings are anticipated to be:

- Wind induced from trees and foliage surrounding each dwelling;
- Water flow within nearby burns;
- Pattering of rain;
- Traffic movement along local roads;
- Localised sources from human activities; and,
- Birdsong and animal activity.

Where predicted operational noise levels exceed the lower limiting values set out in ETSU-R-97, existing background (or baseline) noise levels will be measured, as required by ETSU-R-97 and the GPG referenced above. It is likely that measurements will be required at up to three locations neighbouring the Proposed Development, and for a period of two to three weeks. In reality, it may be required that the survey is extended to allow for an appropriate range of meteorological conditions (i.e. wind speeds and directions) to be experienced at the Proposed Development Site, such that suitably representative/adequate results are obtained. Proposed Development Site-specific meteorological data, over the noise survey period, will be obtained using LiDAR and/or a temporary meteorological mast.

Where noise sensitive properties are potentially affected by noise from the proposed Solar Development, baseline noise measurements will be undertaken to determine the existing background sound levels required by BS 4142 (BSI, 2019) if predicted operational noise levels exceed a certain threshold. Where baseline noise levels have been measured as a required of the wind farm noise impact assessment the data will

be re-evaluated to determine the representative background sound level in line with BS 4142 (BSI, 2019).

It is not intended that baseline noise measurements will be undertaken in respect of assessing potential construction noise impacts as such noise will be assessed against the fixed noise limits that apply for construction noise with a duration of more than one month.

5.8.4 Potential Effects

Operational wind turbine noise associated with the Wind Development operating in isolation and cumulatively with other existing or prospective development will be assessed. Predicted operational noise levels will be compared with the limits set out within ETSU-97 and the Wind Development will be designed such that planning requirements in this respect will be met. Currently, there are no other turbine developments that are expected to require consideration here. However, this aspect will be kept under review.

Operational noise from the Solar Development is typically associated with the inverters, and any transformers or substations, and the most significant noise is generally from cooling fans associated with these elements. Such noise is assessed according to BS 4142:2014+A12019 where the predicted operational noise rating levels are compared with background sound levels, or absolute limits where predicted rating noise levels are low.

Construction and decommissioning of the turbines will occur at distances that are unlikely to result in a breach of typical construction noise limits as prescribed within relevant guidance such as BS 5228 *Code of practice for noise and vibration control on construction and open sites* (BSI, 2014). This, combined with the temporary nature of the works, means that an assessment of the construction noise impacts can often be scoped out. However, possible upgrades to local roads and provision of additional tracks relating to construction access requirements could occur in close proximity to certain dwellings depending on the route taken. As such, only these relatively minor aspects of the Proposed Development may require some consideration in terms of potential noise impacts and a detailed assessment may not be necessary. However, this will be kept under review throughout the EIA process.

There are various aspects that will be scoped out of the assessment or discussed in general terms. This includes construction noise, for the reasons discussed above, and issues frequently raised by third parties opposed to wind farm development in general, such as infrasound, low frequency noise and amplitude modulation. Each of these topics will be discussed in generalised terms within the noise chapter EIA Report for the Proposed Development and a detailed assessment is either not possible and/or not considered necessary.

5.8.5 Impact Assessment

There are no formalised criteria for evaluating noise effects from wind farms. However, for the purposes of the assessment noise impacts will be considered to be not significant if relevant planning criteria for construction and operational noise are met and significant if not.

Operational wind farm noise is typically assessed against noise limits prescribed over and range of wind speeds, as derived in accordance with ETSU-R-97 and the GPG. The noise impact for the Wind Development operating in isolation and cumulatively will be compared with these.

Operational noise associated with the Solar Development will be considered to be not significant if predicted rating noise levels are below 35 dB $L_{A,T,r}$, or if the rating level is no more than 5 dB above the existing representative background sound level.

Construction noise is typically assessed against a fixed daytime criterion for the purposes of planning requirements (i.e. according to the recommendations of BS5228). The impact will be compared with an adopted daytime noise criterion of 65 dB L_{Aeq} .

5.8.6 Questions to Consultees

- Confirmation is sought that the proposed scope of the assessment, as set out here, is adequate?
- Are there any wind farms in the vicinity of the Proposed Development that would need to be included in the cumulative operational noise impact assessment?
- Are there any other relevant consultees who should be contacted with respect to the noise resulting from the Proposed Development?

5.9 Socio Economics, Tourism, Recreation and Land Use

The section sets out the proposed approach to the assessment of potentially significant socio economic, tourism recreation and land use effects of the Proposed Development.

5.9.1 Consultation

A summary of pre application responses received in January 2021 from Dumfries and Galloway Council and relevant consultees in respect of socio economic and tourism matters is summarised below.

DCG Pre application Response

DCG noted that both NPF3 and SPP recognise the opportunities that well planned renewable energy developments can bring to rural communities including associated development, investment and growth of the supply chain, and advised that potential effects of the development on socio-economics, including tourism and recreation should be the subject of an assessment in any submitted EIA report.

NPF4 (which supersedes these policies) states that energy development proposals “will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities”, and requires that project design and mitigation will demonstrate how impacts on communities are to be addressed.

5.9.2 Methodology and Guidance

The socio-economic assessment would be undertaken in line with the following policy and guidance:

- A fairer, greener Scotland: Programme for Government 2021-22 (Scottish Government, 2021);
- Dumfries and Galloway Economy and Development Business Plan 2019-2023;
- National Planning Framework 4 (Scottish Government, 2023);
- Net Economic Benefit and Planning (Scottish Government, 2016);
- Recovery on a Path to Net Zero: Climate Change Plan 2018-2032 – Update (Scottish Government 2020);
- Regional Economic Strategy (South of Scotland Regional Economic Partnership, 2021);
- Relevant regional policy;
- Route map for Renewable Energy (Scottish Government, 2015);
- Scotland Outlook 2030 (Scottish Tourism Alliance, 2020);
- Scotland's National Performance Framework (Scottish Government, 2018);
- Scotland's National Strategy for Economic Transformation (Scottish Government, 2022);
- Scotland's Economic Strategy (Scottish Government, 2015);
- Scottish Tourism Alliance developed The National Tourism Strategy (Scottish Tourism Alliance, 2012);
- South of Scotland Tourism Action Plan; and
- VisitScotland's Position Statement on Wind Farms (VisitScotland, 2014).

These policy documents would also allow for the relevant baseline to be collected.

5.9.3 Potential Effects

Renewable energy developments have the potential to bring a number of socio-economic benefits, including contribution to tackling climate change, reducing carbon emissions, providing electricity, generating an income to the owner and creating jobs.

During construction, operation and decommissioning the Proposed Development has the potential to create a substantial number of jobs.

The majority of the economic activities, with the potential to result in direct effects are associated with construction of the Proposed Development and would be quantified as part of the assessment.

There is also the potential for a number of indirect effects the local economy through the supply of goods and services to the Proposed Development, again particularly during the construction phase.

5.9.4 Impact Assessment

The assessment will consider the potential impact of the Proposed Development on the socio-economic profile of the area.

It will focus on the key lifecycle of the Proposed Development as shown in Table 10.

Table 11: Energy Park Lifecycle

Phase	Activity
Construction	Turbine manufacture; including the tower, blades and internal

Phase	Activity
	<p>components</p> <p>Photovoltaic solar module manufacture; transformer/inverter platform manufacture; erection of security fencing.</p> <p>Balance of plant; including activity and supplies required to install completed turbines, solar panels and supporting infrastructure; and Grid connection; including connection of installed turbines and solar panels to the electricity grid.</p>
Operations & Maintenance	<p>Turbine maintenance; such as turbines that are operated and maintained by the turbine manufacturer for a warranty period or those maintained by contract or by technicians working for the owner of the wind farm.</p> <p>Photovoltaic solar module maintenance; transformer/inverter platform maintenance.</p> <p>Proposed Development Site maintenance; including routine tasks such as maintaining access tracks and bridges, maintaining drainage ditches and repairing gates and fences.</p>
Decommissioning	<p>There will also be further economic impacts at the decommissioning stage, typically after 40 years operation, where the Proposed Development Site will be returned to its original condition</p>

The scale of significance consistent with environmental impact guidance published by the Institute of Environmental Management and Assessment will be used to assess the potential and residual effects of the Proposed Development against baseline conditions.

The assessment will draw on data from the Office of National Statistics and analysis and assumptions in research published by Renewable UK in 2015, Onshore Wind: Economic Impacts in 2014 (Renewable UK, 2015). The assessment process will aim to be objective and quantify effect as far as possible; however, some effects can only be evaluated on a qualitative basis.

In terms of socio-economic factors, potential effects would be significant if the Proposed Development resulted in fundamental or material changes in population, structure of the local community or local economic activity during the construction, operation or decommissioning phases.

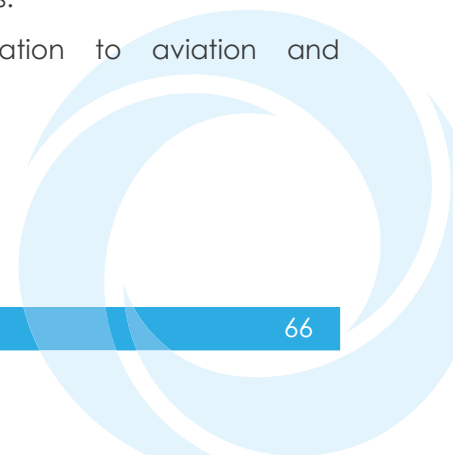
5.9.5 Questions to Consultees

- Is the proposed scope and impact assessment methodology acceptable?

5.10 Other Issues - Telecommunications, Aviation, Shadow Flicker, Safety and Glint and Glare

This section considers the potential for effects of the construction and operation of the Proposed Development on aviation and telecommunications and the potential shadow flicker health and safety effects on sensitive receptors.

Figure 13 shows the Proposed Development in relation to aviation and telecommunication constraints.



5.10.1 Consultation

A summary of pre application responses received in January 2021 from Dumfries and Galloway Council and relevant consultees in respect of these matters is summarised below.

DGC Pre application Response

DGC noted that shadow flicker effects occur only within 130 degrees of north and within ten rotor diameters of a turbine, and that an assessment of this will also require to be undertaken, even if it is to scope out this issue.

5.10.2 Methodology and Guidance

The key relevant policy and guidance which will inform the EIA in relation to telecommunications, aviation, shadow flicker and safety is as follows.

Aviation and Radar

- Civil Aviation Authority (CAA), 1:250,000 and 1:500,000 VFR Charts;
- Civil Aviation Publication (CAP) CAP 168 Licensing of Aerodromes, March 2019;
- CAP 493 Manual of Air Traffic Services Part 1, November 2017;
- CAP 660 Parachuting, July 2008;
- CAP 670 ATS Safety Requirements, August 2019;
- CAP 738 Safeguarding of Aerodromes, December 2006;
- CAP 764 Policy and Guidance on Wind Turbines, February 2016;
- CAP 774 UK Flight Information Services, May 2017;
- CAP 793 Safe Operating Practices at Unlicensed Aerodromes, July 2010;
- Joint Ministry of Defence (MoD)/CAA Wind Farm Interim Guidelines;
- Military Aviation Authority Low Flying Manual, April 2019;
- Military Aviation Authority Manual of Aerodrome Design and Safeguarding, March 2019;
- Military Aviation Authority Traffic Management (3000 series) Instructions, October 2016;
- UK Aeronautical Information Publications (AIP); and
- UK Military Aeronautical Information Publication (MIL AIP).

Telecommunications and Television

- Tall Structures and their Impact on Broadcast and other Wireless Services, 2009, Ofcom.

Shadow Flicker

- Update of UK Shadow Flicker Evidence Base, 2011, Parsons Brinckerhoff. (DECC, 2011); and
- Scottish Government Online Renewables Planning Advice: Onshore Wind Turbines (Scottish Government, 2014).

Health and Safety

- British Standard BS EN 61400-1:2005 Wind turbines. Design requirements;
- Control of Substances Hazardous to Health, 2002;
- Provision and Use of Work Equipment Regulations, 1998;
- The Construction (Design and Management) Regulations, 2015;
- The Health and Safety and Work Act, 1974;
- The Management of Health and Safety at Work Regulations, 1999;
- The Works at Heights Regulations, 2005; and
- Wind Turbines and Horses – Guidance for Planners and Developers, 2014, British Horse Society.

Glint and Glare

A specific national guidance policy for determining the impact of glint and glare on road safety and residential amenity has not been produced to date. In the absence of this, the glint and glare assessment will review more general existing planning guidelines and the available studies in the process of defining its own glint and glare assessment guidance and methodology. This methodology defines the process for determining the impact upon road safety, residential amenity, and aviation activity.

5.10.3 Baseline

A review of existing information in relation to infrastructure, aviation and radar, health and safety, and susceptibility to shadow flicker will be undertaken at the initial stages of the layout design.

An initial review of existing information in relation to telecommunications and television has been undertaken.

Figure 13 illustrates Aviation and Telecommunication constraints associated with the Proposed Development.

Telecommunications and Television

There is a fixed telecommunication link which intersects the Proposed Development Site boundary in the eastern part. At this stage of the site design process there is no site infrastructure located within the vicinity aside from solar panels which is unlikely to have any potential for effects.

Consultation with Ofcom will be undertaken to identify this fixed links status and any potential for effects on telecommunications links.

Aviation and Radar

The Applicant instructed NATS to undertake a Technical and Operational Assessment (TOPA) for the Proposed Development. The assessment concluded that the Proposed Development had the potential to impact on Lowther Radar and Gren Dun Feel Radar. It also concluded that Prestwick Centre ATC and Military ATC have the potential to have unacceptable impacts.

No impacts are anticipated in relation to NATS Navigation Aids or NATS radio communications infrastructure.

The Applicant is currently in discussion with NATS regarding the above conclusions in order to seek appropriate mitigation to minimise potential impacts.

The Proposed Development Site does lie within the MoD high priority for military low flying zone and MoD onshore radar at 80m above ground.

Information including consultation zones and infrastructure resources from the Ministry of Defence (MoD) and NATS will be used.

Consultation with NATS, MoD and other stakeholders will be undertaken.

Shadow Flicker

OS mapping will be used to identify properties with potential susceptibility to shadow flicker. The area around each turbine location within a distance of 10 rotor diameters (1710m) and 130 degrees either side of north (the zone of potential shadow flicker) will be considered.

5.10.4 Potential Effects & Impact Assessment

This section provides an outline of the potential effects of the Proposed Development upon infrastructure and human health interests of the Proposed Development Site and wider environment and an overview of the proposed approach to assessment. Infrastructure interests include the following:

Aviation and Radar

Once the baseline has been identified, consultation with aviation stakeholders will be undertaken to confirm the potential impact. Mitigation will then be discussed and agreed if required.

Health and Safety

Public rights of way will be identified to determine the proximity and potential impact on health and safety. However, public access to the Proposed Development Site in the construction phase will be controlled through good practice and a CEMP to include appropriate measures to safeguard both the public and the workforce.

Wind turbines have a proven track record for good safety. A small number of wind turbines have been known to lose parts of the rotor assembly through accidental damage, due to lightning or mechanical failure, however, such incidents occur infrequently.

No passive member of the public has ever been directly injured during the normal operation of a wind turbine (Irish Wind Energy Association Environmental Impacts, 2019).

Given the nature and location of the Proposed Development, i.e. rural in nature and not within close proximity to settlements, it is considered that the likelihood and effect from potential accidents and disasters is minimal and therefore will be excluded (scoped-out) from detailed assessment.

Telecommunications and Television

It is not anticipated that telecommunication links will be affected. However, for completeness consultation will be undertaken with relevant stakeholders to confirm that no links are affected.

The potential for adverse effects on domestic television reception is greatly diminished post digital switchover, which completed across the UK in 2012 and therefore the likelihood of significant effects is minimal and therefore, excluded (scoped-out) from detailed assessment.

Shadow Flicker

Shadow flicker can arise from the passing of the moving shadow of a wind turbine rotor-blade over a narrow opening such as the window of a nearby residence. A similar effect can also occur when the gloss blades of a rotating turbine reflect the sun causing a flashing light.

Shadow flicker happens only when a certain combination of conditions coincides at particular times of the day and year, mainly in the winter months when the sun is low in the sky (BERR 2009).

The occurrence of shadow flicker and the extent of its effects are dependent on a number of factors, namely:

- Distance from the wind turbine;
- Turbine hub height and rotor diameter;
- Speed of blade rotation;
- The proportion of sunny weather during the months when flicker can occur; and
- The size, shape and orientation of any windows or doors of neighbouring properties.

The flickering may have the potential to cause disturbance and annoyance to residents. It is, however, not possible for turbines to cause photosensitive epilepsy.

It is generally accepted that where a separation distance for wind turbines from habitations exceeds ten times the rotor diameter of a turbine blade (Scottish Government, 2014) shadow flicker cannot occur. In the case of the Proposed Development, shadow flicker may occur at a number of properties.

A shadow flicker model will be run to identify the worst-case scenario annual shadow flicker occurrence. The Update of UK Shadow Flicker Evidence Base (DECC, 2011) guidelines note that a limit of up of 30 hours per year or 30 minutes on the worst affected day is considered acceptable. If properties are identified to exceed the accepted limit, mitigation will be considered.

Glint and Glare

Any solar PV panel has the potential to produce a solar reflection. This blanket term is used to refer to two separate types of reflection: glint, a momentary flash of bright light typically received by moving receptors or from moving reflectors, and glare, a continuous source of bright light typically received by static receptors or from large reflective surfaces.

Glint and glare can significantly affect nearby receptors under particular conditions, with key receptors being residents in surrounding dwellings, road users, train infrastructure (including train drivers), and aviation infrastructure (including pilots and air traffic controllers).

The methodology for the glint and glare assessment will:

- Identify receptors in the area surrounding the Solar Development;

- Consider direct solar reflections from the solar development towards the identified receptors by undertaking geometric calculations;
- Consider the visibility of the panels from the receptor's location. If the panels are not visible from the receptor then no reflection can occur;
- Based on the results of the geometric calculations, determine whether a reflection can occur, and if so, at what time it will occur;
- Consider both the solar reflection from the Solar Development and the location of the direct sunlight with respect to the receptor's position;
- Consider the solar reflection with respect to the published studies and guidance - including intensity calculations where appropriate;
- Determine whether a significant detrimental impact is expected.

5.10.5 Questions to Consultees

- Is the proposed scope and impact assessment methodology acceptable?
- Is it acceptable to scope out potential effects to television reception from the EIA?
- Is it acceptable to scope out potential accidents and disasters from the EIA?

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Appendices

Appendix A. Gazetteer

