Blair Hill Wind Farm

Scoping Report

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1 Introduction

1.1 Background and Context

Renewable Energy Systems (RES) Ltd. ("the Developer") intends to apply to Scottish Ministers via the Scottish Government's Energy Consents Unit (ECU) for permission to construct and operate Blair Hill Wind Farm (hereafter referred to as the "Proposed Development") at a site centred at British National Grid (BNG) 241185 571663 (excluding access route).

The Proposed Development will comprise up to 22 turbines, each with a maximum height of 250 m from ground to blade tip when vertical. Its total generating capacity is, whilst dependent on the rated power of the turbine model procured, is anticipated to be in excess of 50 MW. The ancillary infrastructure is expected to include temporary construction compound(s); gatehouse compound; crane pads; temporary laydown areas adjacent to the turbines; site access tracks; watercourse crossings; cabling; electrical switching station; on-site substation and control building; and energy storage infrastructure (the capacity of the energy storage facility is still to be determined).

It is the intention of the Developer to submit an application for permission under section 36 of the Electricity Act 1989 and deemed planning permission under the Town and Country Planning (Scotland) Act 1989, to construct and operate the Proposed Development. The application will be supported by an Environmental Impact Assessment Report (EIAR) as required by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (hereafter 'the EIA Regulations'). This document forms the EIA Scoping Report submitted to the ECU in order to request an EIA Scoping Opinion, on the content of the Environmental Impact Assessment (EIA) of the Proposed Development.

1.2 Need for the Proposed Development

The science behind the climate crisis is well established and demonstrates the need to phase out fossil fuels in order to avoid adverse economic, environmental, and social effects. International, European and United Kingdom (UK) commitments to reducing CO_2 and tackling the climate crisis have been made by all major economies. In response to these issues the UK has made significant, legally binding commitments to increase the use of renewable energy. The Proposed Development relates directly to those commitments.

The Scottish Government published the Onshore Wind Policy Statement (OWPS) in December 2022. The OWPS states that with nearly 9 gigawatts (GW) currently operational in Scotland, onshore wind is a cheap and reliable source of zero carbon electricity. The Statement, which is the culmination of an extensive consultative process with industry, statutory consultees and the public, then sets an overall ambition of 20 GW of installed onshore wind capacity in Scotland by 2030.

To meet the OWPS targets, new renewable energy projects must be developed where resources are present, environmental effects can be satisfactorily mitigated and social and economic contributions to local communities and/or regional programmes can be secured. The Proposed Development will contribute to this target by providing renewable electricity generation in Scotland and providing an opportunity to reduce CO_2

emissions from our electricity use. The EIAR will include information on the Proposed Development's contribution to renewable energy targets and climate change, through the carbon calculation.

1.3 Purpose of the EIA Scoping Report

The purpose of this EIA Scoping Report is to request that the Scottish Minsters adopt an EIA Scoping Opinion as per Regulation 12(1) of the EIA Regulations as to the scope and level of detail of information to be provided in the EIAR which will support the planning application. The EIA Scoping Opinion will be adopted following consultation with the consultation bodies and other interested public bodies.

The Developer recognises the value of the scoping approach, and the purpose of this report is to ensure that information is provided in accordance with the EIA Regulations, Regulation 12(2).

This EIA Scoping Report:

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

Each technical section concludes with questions for consultees regarding the information provided in this EIA Scoping Report, for which it would be useful to receive feedback. Not all questions will be relevant to all consultees, therefore we request that consultees provide feedback only on those questions appropriate to them. The questions should not be considered an exhaustive list, and consequently consultees are welcome to provide feedback on any issue they consider relevant to the Proposed Development. If consultees elect not to respond, the Developer will assume that consultees are satisfied with the approach adopted/proposed.

1.4 The Applicant

RES is the world's largest independent renewable energy company, active in onshore and offshore wind, solar, energy storage and transmission and distribution. At the forefront of the industry for over 40 years, the Developer has delivered more than 23 GW of renewable energy projects across the globe and supports an operational asset portfolio exceeding 10 GW worldwide for a large client base. Understanding the unique needs of corporate clients, the Developer has secured 1.5 GW of power purchase agreements (PPAs) enabling access to energy at the lowest cost. The Developer employs more than 2,500 people and is active in 11 countries. In the UK alone the Developer is responsible for approximately 10 % of the current wind energy capacity.

From its Glasgow office the Developer has been developing, constructing, and operating wind farms in Scotland since 1993. The Developer has developed and/or built 21 wind farms in Scotland with a total generation capacity of 597 MW and has recently finished constructing the Blary Hill Wind Farm in Argyll and Bute.

1.5 The Agent

ITPEnergised have been commissioned by the Developer as the Agent to coordinate the EIA process for the Proposed Development.

ITPEnergised has supported, assessed, and reported on numerous wind farm and other renewable energy technology applications across Scotland, from single turbine applications to wind farms delivering over 100 MW, solar farms, battery storage and other renewable technologies. Our team has delivered, or are currently working on, EIAs and environmental planning support for over 50 onshore wind farm sites in Scotland and our team members have collectively worked on many more in previous employment.

1.6 Structure of the EIA Scoping Report

The following sections of the EIA Scoping Report comprise the sections listed below:

- **Section 2**: Description of the Development including the site location and context as well as details on the Proposed Development.
- **Section 3**: Environmental Impact Assessment including the approach to EIA, the EIAR and EIAR format.
- **Section 4**: Planning Policy context including identification of the development plan and provides a list of policy and guidance considered.
- **Section 5 to 17**: environmental topics to be considered within the EIAR including the environmental studies, assessment, potential significant effects of the Proposed Development and aspects to be scoped out of assessment.
- **Section 18**: other environmental issues including those considered to not have significant effects and proposed to be scoped out of EIA.

2 Description of the Development

2.1 Site and Surrounds

The Proposed Development is located approximately 400 m east of the River Cree and 2.3 km north of Newton Stewart (refer to **Figure 2.1**) in the Dumfries and Galloway Council (D&G) area ('the Site').

The Site comprises an area of 1235 hectares (ha). The Proposed Development is set within open moorland and areas of commercial forestry. The elevation varies from 100 m Above Ordnance Datum (AOD) to 404 m AOD.

There are four Scheduled Monuments (SM1044, SM1019, SM5676 and SM1015) as well as Coldstream Burn Archaeological Sensitive Area (ASA) within the Site boundary. The northern and eastern extents of the Site border the Galloway Dark Skies Park core area and buffer zones. Galloway Oakwoods Special Area of Conservation (SAC) and Wood of Cree Site of Special Scientific Interest (SSSI) are immediately adjacent to the western boundary of the Site, although more than 2.2 km from the closest proposed turbine. There are a number of watercourses running through the Site including Coldstream Burn, Black Burn, Glenshalloch Burn and Peat Rig Burn.

2.2 Proposed Development

The Proposed Development will consist of up to 22 three bladed horizontal axis turbines. An indicative site layout, including indicative turbine locations is provided in **Figure 2.2**. The indicative turbine locations are noted in Table 2.1 Proposed Indicative Turbine Coordinates (BNG) below.

Table 2.1 Proposed Indicative Turbine Coordinates (BNG)

Turbine Number	X Coordinate	Y Coordinate	Indicative Rotor Diameter (m)	Indicative Hub Height (m)	Indicative Tip Height (m)
1	240343	572071	170	165	250
2	240185	572644	170	165	250
3	240761	572494	170	165	250
4	241327	572678	170	165	250
5	241624	573194	170	165	250
6	241925	573827	170	165	250
7	242616	574005	170	165	250
8	242726	573420	170	165	250
9	242270	573031	170	165	250
10	242527	572466	170	165	250
11	241937	572538	170	165	250
12	241328	572058	170	165	250

Turbine Number	X Coordinate	Y Coordinate	Indicative Rotor Diameter (m)	Indicative Hub Height (m)	Indicative Tip Height (m)
13	241912	571944	170	165	250
14	242467	571728	170	165	250
15	241960	571351	170	165	250
16	241308	571261	170	165	250
17	241701	570815	170	165	250
18	242508	571119	170	165	250
19	242249	570583	170	165	250
20	241584	570231	170	165	250
21	242149	569997	170	165	250
22	242040	569412	170	165	250

It is anticipated that each turbine will have a generating capacity of approximately 6.6 MW.

In addition to the turbines, the following ancillary elements are expected to be required:

- temporary construction compound(s);
- crane pads;
- temporary laydown areas adjacent to the turbines;
- access tracks;
- watercourse crossings;
- underground cables between turbines;
- electrical switching station;
- on-site substation and control building;
- battery storage infrastructure;
- a gatehouse compound;
- telecoms mast;
- concrete batching plant;
- drainage and drainage attenuation measures (as required); and
- potential excavations/borrow workings.

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

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

allowances prior to construction. In this regard, the Developer proposes a micro-siting allowance of up to 75 m in all directions within the site boundary in respect of each turbine and the ancillary infrastructure in order to address any potential difficulties which may arise in the event that preconstruction surveys identify unsuitable ground conditions or environmental constraints that could be avoided.

Consent will be sought for an operational life of 50 years from the date of commissioning the wind turbines.

Based on the preliminary, indicative layout being considered, the Proposed Development will provide a total generating capacity of approximately 145 MW (based on 22 turbines each with a 6.6 MW rated capacity). The capacity of the energy storage facility is still to be determined.

Based on a total installed capacity of 145 MW and a community benefit contribution of £5,000 per MW of installed capacity, the Proposed Development could generate up to £725,000 per annum (up to £36,000,000 in total over 50 years) to support local groups and projects in the surrounding area.

2.3 Cumulative Developments

The EIA Regulations state that cumulative effects should be considered as a part of the EIA. It will therefore be important to consider the cumulative effects of the Proposed Development with other developments in the area, including those that are currently operational, consented and in planning. The cumulative assessment will also consider the cumulative effects of different elements of the Proposed Development on environmental media and sensitive receptors, and in particular the cumulative effects of different effects upon individual and groups of receptors.

Operational wind farms within 20 km of the Proposed Development include Mark Hill, Kilgallioch, Artfield Fell, Glenchamber, Balmurrie Fell, Arechleoch and Areleoch Extension. Consented wind farms as well as those at the application stage, within 20 km of the Proposed Development, are illustrated in **Figure 5.5**. The methodology to be adopted for assessing the cumulative effects of wind energy developments will be in accordance with the NatureScot (NS) (formerly Scottish Natural Heritage) (NS, 2021) Guidance 'Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments'. The scope of the cumulative assessment will be agreed through consultation with D&G Council and NS.

It should be noted that this record will be updated throughout the EIA process, up to a point prior to submission of the application. We welcome any further information from stakeholders on additional proposed wind farm developments that should be considered.

3 Environmental Impact Assessment

3.1 Approach to EIA

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

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

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

An overview of the legislation, policy and guidance considered for each technical assessment is provided within the respective technical Chapters of this EIA Scoping Report.

3.1.1 Consultation

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

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

3.1.2 Baseline Conditions

The baseline conditions will be identified through desk-based studies and site surveys and will describe the environmental characteristic and conditions. The extent of the proposed changes to the existing baseline environment as a result of the Proposed Development will be considered.

3.1.3 Potential Effects

The potential effects relating to the Proposed Development will be identified, described and assessed. The assessment of the effects upon environmental factors will cover the period over the construction and the operation of the Proposed Development. The environmental factors noted with the EIA Regulations are:

- Population and human health;

- Biodiversity and in particular protected species and habitats;
- Land, soil, water, air and climate; and
- Material assets, cultural heritage and the landscape.

It is important to note, based on experience of other wind farm development sites, the environmental factors for consideration within the EIA have been adapted and are listed in **Section 3.2**.

3.1.4 Mitigation

The mitigation measures utilised to avoid, reduce or offset the consequences of the Proposed Development will be embedded within the design or adapted within the construction methodology or mode of operation. It is likely the following draft management plans would be submitted as part of the EIA:

- Construction Environmental Management Plan (CEMP);
- Habitat Management Plan (HMP); and
- Construction Traffic Management Plan (CTMP).

3.1.5 Residual Effects

The remaining effects as a result of the Proposed Development, following implementation of any bespoke mitigation measures, will be considered within the EIA. Residual effects may be adverse or beneficial, short, medium or long term, direct or indirect, permanent or temporary and reversible or irreversible.

3.1.6 Cumulative Effects

The cumulative effects will consider the in-combination effects which are the combined effects of the Proposed Development together with other reasonably foreseeable developments. The cumulative developments will include EIA developments which have a planning application submitted, approved, or are under construction with a set radius of the Site. The study area will differ between each technical assessment and is outlined in the relevant technical sections below.

3.2 EIAR Format

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

- Volume 1 – Written Statement;
- Volume 3 – Figures;
- Volume 3 - Landscape and Visual Impact Assessment: Visualisations;
- Volume 4 – Technical Appendices; and
- Volume 5 – Confidential Annex.

Chapters 1 to 5 of Volume 1 will comprise:

- an introduction;

- a description of the Proposed Development;
- a description of the site selection and design iteration process;
- information on the approach to EIA and determination of significance of effects; and
- a summary of the relevant planning and energy policy considerations.

The remainder of Volume 1 will present a description of effects in respect of a range of environmental topics. Based on available baseline environment information and the details of the Proposed Development, the environmental topics have been scoped on the basis of the potential for significant environmental effects. This has determined the need to undertake impact assessment to investigate each potential effect. Each of the topics will be reported as a Chapter of Volume 1. The EIAR will reference figures and technical studies, which will correspond to Volumes 2 to 5. The following topics will be considered:

- Chapter 6: Landscape and Visual;
- Chapter 7: Cultural Heritage;
- Chapter 8: Ecology;
- Chapter 9: Ornithology;
- Chapter 10: Geology, Hydrology & Hydrogeology;
- Chapter 11: Traffic and Transport;
- Chapter 12: Noise and Vibration;
- Chapter 13: Potential Grid Connections;
- Chapter 14: Climate Balance;
- Chapter 15: Forestry;
- Chapter 16: Aviation;
- Chapter 17: Other Issues (Shadow Flicker and Telecommunications)
- Chapter 17: Schedule of Mitigation; and
- Chapter 18: Summary of Residual Effects.

The Section 36 Application will be accompanied by the following documents;

- Non-Technical Summary (NTS) providing a summary of the key findings from the EIAR;
- Planning Statement assessing the Proposed Development against all relevant planning and energy policy; and
- Pre-Application Consultation (PAC) Report explaining the consultation carried outwith the local communities about the Proposed Development will also accompany the planning application.

Early consultation is key in the development process, and throughout the Developer will ensure that local communities and stakeholders are given the opportunity to provide feedback and are kept informed of project progress.

4 Planning Policy Context

4.1 Introduction

This Section describes the statutory framework within which the application will be submitted and outlines relevant policy and guidance documents that will be taken into consideration to help inform the design of the Proposed Development.

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

4.2 The Statutory Framework

The Proposed Development will have an installed capacity of over 50 Megawatts (MW). In Scotland, onshore renewable energy developments that have capacity to generate over 50 MW require consent from the Scottish Ministers under the Electricity Act 1989 (the 'Electricity Act'). In such cases the Planning Authority is a statutory consultee in the development management process and procedures.

In an application under Section 36 of the Electricity Act the Development Plan does not have primacy in the decision-making process.

The provisions of Schedule 9 of the Electricity Act are relevant to the assessment of the Proposed Development. The provisions of Schedule 9 of the Electricity Act set out a number of features to which regard must be had by the Scottish Ministers and such features have been addressed in the EIA process.

The Scottish Ministers will determine the application having regard to the statutory duties in Schedule 9 of the Electricity Act, so far as relevant, and any other relevant material considerations, one of which will be relevant aspects of the statutory Development Plan.

4.3 Renewable Energy Policy

In recent years United Kingdom (UK) and Scottish Government policies have focussed increasingly on concerns about climate change. Each tier of Government has developed targets, policies and actions to achieve targets to deal with the climate crisis and generate more renewable energy and electricity.

The UK Government retains responsibility for the overall direction of energy policy, although some elements are devolved to the Scottish Government. The UK Government has published a series of policy documents setting out how targets can be achieved. Onshore wind generation, located in Scotland, is identified as an important technology to achieve these various goals.

The Scottish Government has published a number of policy documents and has set its own targets. The most relevant policy, legislative documents and more recent policy statements published by the Scottish Government include:

- The Scottish Energy Strategy (December 2017);
- The Scottish Government's declaration of a Climate Emergency (April 2019);
- The Scottish Climate Change Plan Update (2020);
- The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and the legally binding net zero target for 2045 and interim targets for 2030 and 2040;
- The Scottish Government's 'Programme for Government' (2022);
- The Onshore Wind Policy Statement (December 2022); and
- The Draft Energy Strategy and Just Transition Plan (January 2023).

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

The Proposed Development will make a contribution to the attainment of emissions reduction, renewable energy and electricity targets at both the Scottish and UK levels. Detailed reference to the renewable energy policy framework will be provided in the Planning Statement.

4.4 National Planning Policy & Guidance

4.4.1 National Planning Framework 4

National Planning Framework 4 (NPF4) forms part of the statutory development plan. Section 13 of the Planning (Scotland) Act 2019 amends Section 24 of the Town and Country Planning (Scotland) Act 1997 Act (the '1997 Act') regarding the meaning of 'development plan'. Such that for the purposes of the 1997 Act, the development plan for an area is taken as consisting of the provisions of:

- The National Planning Framework; and
- Any Local Development Plan (LDP).

NPF4 introduces centralised development management policies which are to be applied Scotland wide, and also provides guidance to Planning Authorities with regard to the content and preparation of LDPs.

NPF4 continues the approach set out in NPF3 of identifying national developments. Proposed National Development 3 (ND3) is entitled 'Strategic Renewable Electricity Generation and Transmission Infrastructure'. The Proposed Development will therefore have national development status as per these provisions of NPF4. The most relevant policies include the following:

- Policy 1: Tackling the Climate and Nature Crisis;
- Policy 3: Biodiversity;
- Policy 4: Natural Places;

- Policy 5: Soils;
- Policy 6: Forestry, Woodland and Trees;
- Policy 7: Historic Assets and Places; and
- Policy 11: Energy.

For the consideration of onshore wind energy development, Policy 11 is the lead policy. NPF4 will be the key policy consideration for the determination of the Proposed Development as part of the statutory Development plan.

4.4.2 National Planning Guidance

National planning guidance and advice are material considerations, which are relevant to the Proposed Development and will be considered in the EIAR. These include, but are not limited to, the following documents:

- Planning Advice Note (PAN) 1/2011 Planning and Noise (Scottish Government, March 2011);
- PAN 2/2011 Planning and Archaeology (Scottish Government, July 2011);
- PAN 1/2013 Environmental Impact Assessment (Scottish Government, August 2013);
- PAN 51 Planning, Environmental Protection and Regulation (Scottish Government, October 2006);
- PAN 60 Planning for Natural Heritage (Scottish Government, January 2008);
- PAN 69 Planning and Building Standards Advice on Flooding (Scottish Government, August 2004);
- PAN 75 Planning for Transport (Scottish Government, August 2005); and
- PAN 79 Water and Drainage (Scottish Government, September 2006).

4.5 The Local Development Plan

The local planning policy context applicable to the Application Site will be taken into account and will be described in the EIAR. The application site is located within the administrative area of D&G.

The Local Development Plan for the site comprises the Dumfries and Galloway Local Development Plan 2 (the 'LDP2') (adopted September 2019) and associated Supplementary Guidance (SG). Of relevance will be the Wind Energy Development: Development Management Considerations (February 2020) and Part 1 Wind Energy Development: Appendix 'C' Dumfries & Galloway Wind Farm Landscape Capacity Study (February 2020).

Key LDP2 policies will include Policies IN1: Renewable Energy and IN2 Wind Energy. Other LDP2 policies that will be considered include policies:

- OP1: Development Considerations;
- HE1: Listed Buildings;
- HE2: Conservation Areas;
- HE3: Archaeology;
- HE4: Archaeologically Sensitive Areas;

- NE2: Regional Scenic Areas;
- NE5: Species of International Importance;
- NE7: Forestry and Woodland;
- NE8: Trees and Development;
- NE11: Supporting the Water Environment;
- NE14: Carbon Rich Soil;
- ED10: Galloway and Southern Ayrshire Biosphere;
- ED11: Dark Skies;
- CF4: Access Routes;
- IN7: Flooding and Development;
- T1: Transport Infrastructure; and
- T2: Location of Development / Accessibility.

It should be noted that a Planning Statement will be provided with the application for consent (but separate from the EIAR) which will contain an assessment of the accordance of the Proposed Development with relevant policy documents as referred to above.

4.6 Summary

The Proposed Development will make a contribution to the attainment of renewable energy and electricity targets and emissions reduction at both the Scottish and UK levels and the quantification of this contribution will be described in the EIAR.

The EIAR will summarise the renewable energy policy framework, but the detail and policy appraisal will be provided in a supporting Planning Statement to accompany the Section 36 application.

5 Landscape and Visual

5.1 Introduction

The Landscape and Visual Impact Assessment (LVIA) will define the existing landscape and visual baseline environments; assess their sensitivity to change; describe the key landscape and visual related aspects of the Proposed Development; describe the nature of the anticipated change upon both the landscape and visual environments; and assess the effects during construction and operation.

5.2 Baseline Description

The Proposed Development is located within D&G, approximately 2.3 km north of Newton Stewart and adjacent to the Galloway Forest. The Site extends long the valley of Black Burn, a tributary of the River Cree, and over a number of small hills including Glenmalloch Hill at 245 m AOD and Benailsa at 404 m AOD. There are large areas of commercial woodland within the Site, as well as the Moor of Drannandow in the north of the Site and further moorland in the south-west.

5.2.1 Study Areas

A study area of 45 km from the outermost turbines of the Proposed Development in all directions is proposed to initially cover all potentially material landscape and visual impacts, as per the suggested study area proposed within NatureScot's 'Visual Representation of Wind Farms' guidance. However, it is most likely that significant effects will be located closer to the Proposed Development.

In addition, the following study areas are proposed for different aspects of the LVIA:

- 15 km for night-time effects;
- 15 km for the detailed assessment of effects on landscape character (daytime);
- 35 km for cumulative effects; and
- 3 km for the residential visual amenity assessment.

5.2.2 Landscape Character

The D&G Landscape Assessment was undertaken in 1998. Whilst this document is still referred to in the DGLDP2, NatureScot has undertaken updated landscape character studies that were published in 2019, which now supersedes the 1998 study.

NatureScot's 2019 Landscape Character Assessment shows the Proposed Development to be predominantly within Landscape Character Type (LCT) 181 - Rugged Uplands with Forest - Dumfries & Galloway. LCT181 is described as *"areas with predominant forest cover. An essential characteristic of this landscape is the view of granite outcrops and of unforested peaks which are made distinctive by the contrasting colours of grey granite against dark heather and ochre grassland"*. LCT181 is very sparsely populated.

The landform within LCT181 is described as of a grand scale, with views *"through clearings of rugged granite hills"* identified as a key characteristic. The LCT is also noted to have "*a strong sense of remoteness and wild character*". Most of this landscape is within the Galloway Forest Park and the Galloway Hills Regional Scenic Area. It is also incorporated into the Galloway Dark Skies Park and Biosphere, reflecting strong scenic and recreational interests.

The southern area of the Site falls within LCT172 - Upland Fringe - Dumfries & Galloway. The description of LCT172 notes "these areas tend to form the most visible faces of the uplands they surround. The landscape is of high, gently rolling pastures. Topography is locally uneven, with numerous minor valleys, ridges and hollows".

The character of LCT172 is described as lying in "its very transitional feel between lowland pastures and upland areas, created in large part by the current balance between agriculture and forestry. These landscapes are visually prominent from populated lowland areas …, forming important skylines/backdrops. Many provide a good outlook, often with panoramic views". The description goes on to note "This landscape has a feeling of upland exposure, but it is generally well treed and settled. The road network is extensive".

The most westerly part of the Site lies within LCT174 - Plateau Moorland with Forest - Dumfries & Galloway. LCT174 is described as *"flat or very gently undulating. Height ranges between 150 and 250 metres"*. The description of LCT174 notes *"Large-scale wind farms are a key and defining characteristic in the west"*.

Landcover within LCT174 is described as defined by "*extensive conifer forests, which are gradually being modified by redesign at rotation or where wind farms are being located*". Moorland is also noted as a component of this LCT, and lochs as an important feature. There is evidence of pre-improvement (pre 19th Century) relict land uses throughout the LCT.

5.2.3 Visual Amenity

Key visual receptors are likely to include:

- Residents of and visitors to Newton Stewart to the south, settlements on The Machars Peninsula to the south and along the Rhins of Galloway peninsula to the south-west.
- Users of recreation routes and accessible land within Galloway Forest, cyclists using the SuSTRANS cycle route along the River Cree to the south-west, users of local walking and cycling routes.
- Users of the A75, A714, A746, A747 to the south-west and the A712 to the south-east.

5.2.4 Landscape Designations

Landscape designations are shown on **Figure 5.1**. The Site lies within the Galloway Hills Regional Scenic Area (RSA) and Local Landscape Area (LLA) designations. The Site is also immediately adjacent to the Park Boundary of the Galloway Dark Skies Park.

National designations within the study area consist of Fleet Valley National Scenic Area (NSA), located 15.1 km south-east of the closest proposed turbine, and the East Stewartry Coast NSA, located at the south-western

edge of the study area, approximately 38 km from the closest proposed turbine. Merrick Wild Land Area (WLA) is located 4.9 km north-east of the closest proposed turbine.

At a regional level, other RSAs within the study area include Mochrum Lochs located 16.1 km south-west of the closest proposed turbine, Machars Coast located 20.1 km south, Solway Coast located 22.2 km south-east, Rhins Coast located 33.2 km west, Thornhill Uplands located 33.4 km north-east and Terregles Ridge located 40.3 km east.

At a local level there are a large number of LLAs within the study area.

5.3 Legislation, Policy and Guidance

The LVIA will be undertaken in accordance with current best practice guidance. The assessment will be undertaken in cognisance of the following guidance and policy documents:

- Dumfries and Galloway Council (2020) Dark Skies Friendly Lighting Supplementary Guidance.
- Dumfries and Galloway Council (2019) Local Development Plan 2.
- Dumfries and Galloway Council (2018) Regional Scenic Areas Technical Paper.
- Dumfries and Galloway Council (2020) Wind Energy Development: Development Management Considerations: Supplementary Guidance.
- Dumfries and Galloway Council (2020) Part 1 Wind Energy Development: Development Management Considerations Appendix 'C' Dumfries and Galloway Wind Farm Landscape Capacity Study: Supplementary Guidance.
- East Ayrshire Council (2017) East Ayrshire Local Development Plan Volumes 1 and 2.
- East Ayrshire Council (2017) Supplementary Guidance: Dark Sky Park Lighting.
- East Ayrshire Council (2017) Supplementary Guidance: Planning for Wind Energy.
- Landscape Institute and Institute of Environmental Management & Assessment (2013). Guidelines for Landscape and Visual Impact Assessment, 3rd Edition.
- Landscape Institute (2019). Technical Guidance Note 02/19: Residential Visual Amenity Assessment (RVAA).
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5.4 Assessment Methodology

"Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and people's views and visual amenity." (Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3), 2013, para 1.1).

Sections 2.20 - 2.22 of the same guidance indicate that the two components (assessment of landscape effects, and assessment of visual effects) are *"related but very different considerations"*.

The assessment method will draw upon the established GLVIA3 and other recognised guidelines, as identified above.

5.4.1 Zones of Theoretical Visibility

Draft ZTV studies have been prepared based on the initial turbine layout and sizes. These are shown on **Figure 5.2** and **5.3** and indicate areas of potential visibility for the proposed hub height and blade tip heights of the turbines. The analysis was carried out using a topographic model alone, in accordance with NatureScot's 'Visualisation of Wind Farms Best Practice' guidance (**Figure 5.2**); and including settlements and woodlands (with heights derived from NEXTMAP 25 surface mapping data) as visual barriers to provide a more realistic indication of potential visibility (**Figure 5.3**).

ZTV studies will be used to aid the identification of receptors which are likely to be significantly affected by the Proposed Development and those which may be scoped out.

5.4.2 Landscape Character

The European Landscape Convention (2000) provides the following definition:

"Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors."

It notes also in Article 2 that landscape includes "natural, rural, urban and peri-urban areas. It includes land, inland water and marine areas".

An Approach to Landscape Character Assessment (Natural England, 2014) defines landscape character as:

"a distinct and recognisable pattern of elements, or characteristics, in the landscape that make one landscape different from another, rather than better or worse."

The susceptibility of landscape character areas is judged based on both the attributes of the receiving environment and the characteristics of the Proposed Development. Thus, the key characteristics of the landscape character types/areas are considered, along with scale, openness, topography; the absence of, or presence of, nature and patterns of development, settlement, landcover, the contribution of heritage assets and historic landscape elements and patterns, and land uses in forming the character. The condition of the receiving landscape, i.e. the intactness of the existing character will also be relevant in determining susceptibility. The likelihood of material effects on the landscape character areas can be judged based on the scale and layout of the proposal and how this relates to the characteristics of the receiving landscape.

The introduction of any development into a landscape adds a new feature which can affect the 'sense of place' in its near vicinity, but with distance, the existing characteristics reassert themselves.

The baseline is informed by desk study of published landscape character assessments and field survey. It is specifically noted within An Approach to Landscape Character Assessment (Natural England) that:

"Our landscapes have evolved over time, and they will continue to evolve – change is a constant, but outcomes vary. The management of change is essential to ensure that we achieve sustainable outcomes – social, environmental and economic. Decision makers need to understand the baseline and the implications of their decisions for that baseline."

On page 51 it describes the function of Key Characteristics in landscape assessment, as follows:

"Key characteristics are those combinations of elements which help to give an area its distinctive sense of place. If these characteristics change, or are lost, there would be significant consequences for the current character of the landscape. Key characteristics are particularly important in the development of planning and management policies. They are important for monitoring change and can provide a useful reference point against which landscape change can be assessed. They can be used as indicators to inform thinking about whether and how the landscape is changing and whether, or not, particular policies – for example - are effective and having the desired effect on landscape character."

It follows from the above that in order to assess whether landscape character is significantly affected by a development, it should be determined how each of the key characteristics would be affected. The judgement of magnitude therefore reflects the degree to which the key characteristics and elements which form those characteristics will be altered by the proposals. The size of the development, the nature and susceptibility of the receiving landscape, and local 'barriers' in the landscape (such as breaks of topography, woodlands, settlements, and roads or rivers) will determine the exact extent of effects for each development, but in practice significant effects on landscape character related to this Proposed Development are unlikely beyond 15 km.

It is proposed that NatureScot's 2019 Landscape Character Assessment is used as the basis to assess effects on landscape character. This assessment reviewed, consolidated and updated previous regional assessments, superseding those commissioned between 1994 and 1999.

5.4.3 Visual Receptors

A wide variety of visual receptors can reasonably be anticipated to be affected by the Proposed Development. Within the baseline assessment, the Zone of Theoretical Visibility (ZTV) study and site visits are used to determine which visual receptors are likely to be significantly affected and therefore merit detailed assessment. In line with GLVIA3; both representative and specific viewpoints may be identified to inform the assessment. In general, the majority of viewpoints will be representative, representing the visual receptors at the distance and direction in which they are located and of the type(s) that would be present at that location. The representative viewpoints have generally been selected in locations where significant effects would be anticipated; though some may be selected outside of that zone – either to demonstrate the reduction of effects with distance; or to specifically ensure the representation of a particularly sensitive receptor.

The types of visual receptors likely to be included with the assessment are:

- Users of walking routes or accessible landscapes including Public Rights of Way, National and Regional Trails and other long-distance routes, Open Access Land, permissive paths, land held in trust (e.g. Woodland Trust, National Trust) offering free public access, and other regularly used, permitted walking routes;
- Visitors to and residents of settlements;
- Visitors to specific valued viewpoints;
- Visitors to attractions or heritage assets for which landscape and views contribute to the experience; and
- Users of roads or identified scenic routes.

Visual receptors are grouped for assessment into areas which include all of the routes, public spaces and homes within that area. Groups are selected as follows:

- Based around settlements in order to describe effects on that community e.g. a settlement and routes radiating from that settlement; or
- An area of open countryside encompassing a number of routes, accessible spaces and individual dwellings; or
- An area of accessible landscape and routes within and around it e.g. a country park; and
- such that effects within a single visual receptor group are similar enough to be readily described and assessed.

With the exception of specific viewpoints, each route, settlement or location will encompass a range of possible views, which might vary from no view of the development to very clear, close views. Therefore, effects are described in such a way as to identify where views towards the development are likely to arise

and what the scale, duration and extent of those views are likely to be. In some cases, this will be further informed by a nearby viewpoint and in others it will be informed with reference to the ZTV, aerial photography and site visits. Each of these individual effects are then considered together in order to reach a judgement of the effects on the visual receptors along that route, or in that place.

The representative viewpoints are used as 'samples' on which to base judgements of the scale of effects on visual receptors. The viewpoints represent multiple visual receptors, and duration and extent are judged when assessing impacts on the visual receptors.

For specific viewpoints (key and sometimes promoted viewpoints within the landscape), duration and extent are assessed, with extent reflecting the extent to which the development affects the valued qualities of the view from the specific viewpoint.

5.4.3.1 Proposed LVIA Viewpoint Locations

The draft ZTV studies referred to above and shown on **Figures 5.2** and **5.3** have been used to identify suggested viewpoint locations for use in the LVIA. Consideration has also been given to D&Gs 2020 Supplementary Guidance 'Part 1 Wind Energy Development: Development Management Considerations Appendix 'C' D&G Wind Farm Landscape Capacity Study' and South Ayrshire's 2018 'Landscape Wind Capacity Study' which identify key viewpoints and landmark hills within the study area. Consideration has also been given to viewpoints identified within the recent Arecleoch Variation (ECU ref: ECU00001864) and South Kyle II (ECU ref: ECU00003429) applications, alongside the Artfield Forest application Artfield Forest (ECU ref: ECU00003245), for potential cumulative effects.

It is proposed that the 19 locations set out in Table 5.1 Proposed LVIA Viewpoints are included as viewpoints in the LVIA. The locations, which are illustrated on **Figures 5.2** and **5.3**, represent visual receptors and character types at a range of distances and directions from the Site. These representative viewpoints will be used as 'samples' on which to base judgements of the scale of effects on visual receptors and represent a wide range of receptors – including not only those actually at the viewpoint, but also those nearby, at a similar distance and/or direction.

Table 5.1 Proposed LVIA Viewpoints

Viewpoint	Distance and direction from closest proposed turbine	View / receptors represented
VP1: Drumwhirn Cairn, Moor of Barclye	2.6 km, south-west	Represents users of the RSPB moorland and users of NCR7 along to minor road to the south-west of the Site.
VP2: Corsbie Road, Newton Stewart	4.1 km, south	Represents the experience of visitors and residents along the northern edge of Newton Stewart.
VP3: A75 south of Newton Stewart	4.7 km, south	Represents users of the A75, visitors and residents on the outskirts of Newton Stewart

Viewpoint	Distance and direction from closest proposed turbine	View / receptors represented
		and users of NCR73 which passes below the A75.
VP4: Glenvernoch Fell / Hill of Ochiltree	7.6 km, west	Represents recreational users of the Southern Upland Way around Glenverloch Fell.
VP5: NCR7 on Minor Road North of Glentrool Village	7.9 km, north-west	Represents visitors and residents of Glentrool Village, users of NCR7 and recreational users of Glentrool Forest.
VP6: Cairnsmore of Fleet	8.4 km, east	Represents users of the recreational landscape to the east.
VP7: Merrick	11.5 km, north	Represents recreational users of the landscape to the north, including the Dark Sky Park.
VP8: A75 near Creetown	12.3 km, south	Represents users of the A75 travelling towards the Proposed Development and visitors and residents on the outskirts of Creetown.
VP9: Kirkcowan	12.6 km, south-west	Represents visitors and residents of Kirkcowan and users of the neighbouring minor roads.
VP10: NCR73 on Minor Road North of Wigtown	13.3 km, south	Represents visitors and residents on the outskirts of Wigtown and users of NCR73.
VP11: Benniguinea Lookout	14.2 km, east	Represents users of the recreational landscape to the east.
VP12: Mochrum Lochs LLA, Moor of Drumwall	19.0 km, south-west	Represents the LLA and users of the minor roads to the south-west around Gargrie Moor.
VP13: Minor Road near Barhill Station	19.6 km, south-west	Represents visibility to the north-west from areas around Barrhill.
VP14: Southern Upland Way near Artfield Fell	19.6 km, west	Represents recreational users of the Southern Upland Way to the west.
VP15: A76 North of Whithorn	28.5 km, south	Represents users of the A76 and residents and visitors to Whithorn, south of the Site.
VP16: Byne Hill	31.3 km, north-west	Represents users of the recreational landscapes to the north-west near Girvan.

Viewpoint	Distance and direction from closest proposed turbine	View / receptors represented
VP17: A712 east of Corsock	36.5 km, east	Represents users of the A712 to the east.
VP18: Southern Upland Way near Stranraer	37.6 km, south-west	Represents recreational users of the Southern Upland Way, recreational landscapes and minor roads near Stranraer.
VP19: Sandhead	37.8 km, south-west	Represents residents and visitors of Sandhead, users of the beach and other recreational landscapes.

5.4.3.2 Visualisations

Visualisations will be prepared in accordance with NatureScot's 'Visualisation of Wind Farms Best Practice'. Wirelines and photomontage visualisations will be used to aid the assessment. These will be generated from a 3-dimensional (3D) model of the proposed wind turbines, site and surrounding topography, using key landmarks and compass bearings to match the modelled views to the photographs.

Photographs, wirelines and photomontages will be shown on figures supporting the LVIA. It is anticipated that a baseline panorama and wireline (including cumulative schemes) and a wireline of the Proposed Development will be provided for all suggested viewpoints. Photomontages will be prepared for all viewpoints within 5 km of the Proposed Development, and a selection of the more distant viewpoints. Night-time wirelines and photomontages will be prepared to support the night-time assessment, utilising a selection of the daytime viewpoints that would be most likely to be significantly affected by lighting. These are likely to include settlements.

5.4.4 Designated Landscapes

In considering the effects on designated areas, a number of factors need to be considered. The effects on the component landscape character areas and the effects on views from within and towards the designated area need to be understood. These effects will then be considered in the light of the documented special qualities, valued elements or characteristics, and the purposes of the designation to arrive at a judgement of the effects on the designated landscape or landscape element.

5.4.5 Night Time Assessment

Onshore wind turbines of over 150 m in height require mandatory visible spectrum aviation lighting. Night-time assessment of visible aviation lighting for onshore wind turbines on landscape and visual receptors is a relatively new area and there is as yet no specific policy or guidance on the subject, although there is emerging best-practice (including as noted within Annex 2 of NatureScot's 'General preapplication and scoping advice for onshore wind') that will be taken into consideration in undertaking the night-time assessment.

5.4.5.1 *Effects on Landscape Character*

For landscape character areas, susceptibility is judged based on the degree to which they are currently characterised by darkness and/or an absence of development. Value is judged based on the same factors as for the daytime assessment unless particular factors suggest otherwise. For example, identification of a Dark Sky Park which would increase value; or where factors that contribute to value in daytime are irrelevant at night – which may reduce value at night.

5.4.5.2 *Effects on Visual Receptors*

For visual receptors, the assessment will take account of the different importance attached to views in the night-time environment. Generally, the value attached to night-time views is considered to be low unless there is a particular feature that can be best appreciated in the hours of darkness. This may include views of stars and the night sky that are only possible in particularly dark areas or views of well-known landmarks that are lit up at night.

5.4.6 Cumulative Assessment

Cumulative assessment relates to the assessment of the effects of more than one development. A 35 km search area from the Site is proposed for this LVIA. In terms of selecting which wind turbine proposals within the study area should be included, NatureScot Guidance 'Assessing the Cumulative Impact of Onshore Wind Energy Developments' advises that:

"An assessment of cumulative impacts associated with a specific development proposal should encompass the effects of the proposal in combination with:

- *existing development, either built or under construction;*
- *approved development, awaiting implementation; and*
- *proposals awaiting determination within the planning process with design information in the public domain. Proposals and design information may be deemed to be in the public domain once an application has been lodged, and the decision-making authority has formally registered the application.*" [para. 26] – note that this category also includes recently refused applications which may yet be appealed.

For each of these schemes, we would seek agreement as to whether they should be included in the assessment. Initial cumulative ZTVs, showing the likely areas where schemes may be visible, may be used to inform such discussions. For this assessment, the following detailed criteria are suggested to ensure that the cumulative assessment is proportionate:

a) The location of wind farm schemes of 3 turbines (or more) and 70 m to tip (or greater) are identified within the 35 km LVIA study area for context. These are listed within the cumulative assessment and identified on plans, including their planning status.

b) Full detail (including turbine locations and heights) are included for wind farms of 3 turbines (or more) and 70 m to tip (or greater) within a 15 km study area. The 15 km radius would be applied

flexibly such that wind farms only just beyond this distance and/or those that are judged to be particularly relevant to the assessment based on the assessed effects of the Proposed Development are also included in full detail.

c) Full details of all wind development of 50 m tip (or greater) within 5 km would also be included in the assessment.

d) The visualisations only model those developments identified within items b and c above.

Schemes which are in scoping will also be noted for context but will not be included within the assessment unless they become active applications before the LVIA is submitted, with occasional exceptions for schemes where reliable information is available with respect to the scheme design, and the application is known to be imminent.

The cumulative assessment will examine the same landscape and visual receptors as the assessment for the Proposed Development. The assessment will be informed by cumulative ZTVs, showing the extent of visual effects of the schemes in different colours to illustrate where visibility of more than one development is likely to arise. Cumulative wireframes will be prepared which show each of the developments in different colours so that they are each readily identifiable. Cumulative photomontages will also be prepared.

In addition, the effects on users of routes through the area, from which wind farms may be sequentially visible as one passes through the landscape are also considered. This assessment will be based on the desk study of ZTVs and aerial photography, and site visits to travel along the routes being assessed.

It is important to note the following:

- Operational and consented wind farms are treated as being part of the landscape and visual baseline. i.e. it is assumed that consented schemes will be built except for occasional exceptions where there is good reason to assume that they will not be constructed. Reflecting this, the main LVIA assesses effects on the basis that these developments are (and will be for consented developments) in place as part of the baseline.
- Schemes 'in planning' are assessed via a series of scenarios involving one or several of the other developments being consented along with (or before) the Proposed Development. Assessment ratings are provided for each scenario which indicate the additional effects that consenting the Proposed Development would have if the other schemes were already consented (incremental effects).

For each assessed receptor, additional effects may be the same as for the Proposed Development or reduced (where the influence of other schemes in planning would be such that were they consented and considered to be part of the baseline, the incremental change arising from the addition of the Proposed Development would be less).

5.4.6.1 Cumulative Schemes

Current cumulative sites within the proposed 35 km study area are detailed within **Table 5.2** below and shown on **Figure 5.5**.

Table 5.2 Cumulative Sites within 35 km

Site	Blade tip height of turbines (m)	No. of turbines	Distance and Direction to Proposed Development
Operational			
fton	5 @ 100 m, 20 @ 120m	25	34 km, north-east
Airies Fell	137 m	14	11 km, west
Arecleoch	118 m	60	21.5 km, west
Artfield Fell	74 m	15	15.6 km, west
Assel Valley	110 m	10	28.6 km, north-west
Balmurrie Fell (Artfield Fell Extension)	80 m	7	17 km, west
Barlockhart Moor	110 m	4	20.9 km, south-east
Blackcraig	110 m	23	27.6 km, north-east
Carscreugh	70 m	18	17.8 km, south-east
Dersalloch	7 @ 115 m, 16 @ 125 m	23	28.7 km, north
Glen App	126.5 m	11	29.3 km, west
Glenchamber	126.5 m	11	16.7 km, south-west
Hadyard Hill	100 m & 110 m	51	27.4 km, north-west
Kilgallioch	146.5 m	96	12.2 km, west
Maclachrieston Farm	53.7 m	1	26.9 km, north-west
Mark Hill	110 m	28	18.5 km, north-west
South Kyle	149.5 m	50	28.8 km, north-east
Tralorg	100 m	8	30.2 km, north-west
Wether Hill	91 m	14	32 km, north-east
Windy Rig	125 m	12	30.9 km, north-east
Windy Standard	53.65m	36	31.7 km, north-east
Windy Standard Extension	12 @ 100 m, 9 @ 115 m,9 @ 120 m	30	30.2 km, north-east
Consented			
Barlockhart Moor Extension	115 m	4	20.5 km, south-west
Benbrack	1 @ 132 m, 1 @ 135 m, 16 @ 149.9 m	18	27.5 km, north-east

Site	Blade tip height of turbines (m)	No. of turbines	Distance and Direction to Proposed Development
Chirmorie	149.9 m	21	19.3 km, west
Cornharrow	180 m	7	31.1 km, north-east
Enoch Hill Variation	149.9 m	16	34.3 km, north-east
Fell	2 @ 180 m, 7 @ 200 m	9	31.4 km, north-east
Gass	126.5 m	9	13.6 km, west
Glenshimmeroch Variation	4 @ 180 m, 6 @ 200 m	10	26.2 km, north-east
Kirk Hill	115.5 m	8	34.2 km, north-west
Kilgallioch Extension	180 m	9	18.9 km, west
Knockman Hill	81 m	5	25.8 km, north-east
Margree	200 m	9	28.2 km, north-east
Stranoch	2 @ 140 m, 2 @ 142.5 m, 7 @ 149.9 m, 9 @ 175 m.	20	22.4 km, west
Torrs Hill	100 m	2	17.4 km, north-east
Troston Loch	149.9 m	14	27.7 km, north-east
Windy Standard III	8 @ 125 m, 12 @ 177.5 m	20	28.7 km, north-east
Application			
Arecleoch Extension	200 m	13	20.1 km, west
Carrick	200 m	13	22.9 km, north
Clauchrie	200 m	18	18.3 km, north-west
Cornharrow Variation	200 m	7	31.1 km, north-east
Craiginmoddie	200 m	14	25.9 km, north-west
Divot hill	200 m	9	27.2 km, north-east
Fell Variation	1 @ 180 m, 8 @ 200 m	9	31.2 km, north-east
Garvilland	149.5 m	5	19.5 km, south-west
Knockcronal	3 @ 180 m, 6 @ 200 m	9	24.6 km, north
Knockodhar	2 @ 149.9 m, 10 @ 180 m, 4 @ 200 m	16	21.6 km, north-west
Lorg Revision	200 m	15	33.7 km, north-east
Manquhill	200 m	8	31 km, north-east
Quantans Hill	200 m	14	24.6 km, north-east
Sclenteuch	4 @ 180 m, 5 @ 200 m	9	32 km, north
Shepherd's Rig	2 @ 125 m, 15 @ 149.9 m	17	26 km, north-east
Scoping			
Mid Moile	230 m	21	27.4 km, west

Site	Blade tip height of turbines (m)	No. of turbines	Distance and Direction to Proposed Development
South Kyle II	220 m	17	32.2 km, north-east

5.4.7 Residential Visual Amenity

Wind farms are generally regarded as being a form of development for which it is appropriate to undertake a residential visual amenity assessment, as the scale of development is such that the turbines may lead to effects being perceived as 'overbearing' or 'overwhelming' as set out within Residential Visual Amenity Assessment Guidance (LI TGN 02/19).

For the Proposed Development a 3 km study area is proposed for the Residential Visual Amenity Assessment (RVAA). The full methodology for the study, in line with LI TGN 02/19, and results will be included as an appendix to the LVIA. The RVAA will follow the stages outlined in LI TGN 02/19:

- Definition of study area and scope of the assessment – informed by the description of the Proposed Development, defining the study area extent and scope of the assessment with respect to the properties to be included.
- Evaluation of baseline visual amenity at properties to be included having regard to the landscape and visual context and the development proposed.
- Assessment of likely change to visual amenity of included properties in accordance with GLVIA3 principles and processes.
- Further assessment of predicted change to visual amenity of properties to be included forming a judgement with respect to the Residential Visual Amenity Threshold.

Cross references will be made between the LVIA and the RVAA as follows:

- where viewpoints are located close to properties, this will be noted in the residential visual amenity assessment;
- the availability of views from properties towards the development will be noted where relevant within the LVIA (for example in respect of effects on settlements); and
- an overview of visual effects on the properties covered by the residential visual amenity assessment will be provided within the summary.

5.5 Potential Mitigation

The initial layout for the Proposed Development, as well as turbine choice(s) and 'mitigation by design' options, will be reviewed as part of the initial stages of the LVIA process. The turbine layout and heights will be carefully optimised in terms of achieving a coherent layout, ensuring that guidance within both the NatureScot guidance on 'Siting and designing wind farms in the landscape' and D&G Wind Farm Landscape Capacity Study: Supplementary Guidance. Consideration will also be given to the location of the tracks,

substation, control building, battery energy storage system compound and borrow pits, and how those fit within the landscape.

5.6 Potential Effects

Potential landscape and visual effects arising from the Proposed Development will mainly derive from the following factors:

- During construction:
  - movement of machinery and traffic to and around the construction site;
  - removal of vegetation as part of site clearance;
  - earthworks to prepare the Site for construction;
  - construction working areas, including storage and offices;
  - construction of the Proposed Development; and
  - effects at night may also be experienced as a result of security and other lighting.

- During operation:
  - effects will result from the elements of the Proposed Development, including wind turbines, on-site substation, battery energy storage system compound, wind farm control building with welfare facility, permanent communications mast, and on-site access tracks; and
  - effects at night may also be experienced as a result of aviation lighting.

The introduction of the Proposed Development would have an effect on landscape character; visual receptors such as residents, pedestrians, cyclists, and road users; and on designated landscapes.

5.6.1 Matters Scoped Out

Where the ZTV studies indicate no potential visibility of the Proposed Development, landscape and visual receptors, as well as any designated landscapes, will be scoped out of detailed assessment. Refer to **Figure 5.4** which presents a combined ZTV and policy figure.

The ZTV studies show no visibility in East Ayrshire, approximately 11.5 km north of the nearest turbine. As such, effects on East Ayrshire are unlikely to occur and it is proposed that it is scoped out of the detailed assessment.

Visibility on Gardens and Designed Landscapes within the study area varies, with the majority experiencing no visibility of the Proposed Development. Gardens and Designed landscapes in the west and south-west experiencing visibility either lie behind existing operational windfarms or at such a distance that adverse landscape and visual effects are unlikely to occur. Two Gardens and Designed Landscapes lie approximately 25 km to the south of the Proposed Development, the ZTV shows intermittent visibility across these designated landscapes; due to the distance adverse effects are unlikely to occur. For this reason, it is proposed that Gardens and Designed Landscapes are scoped out of the detailed assessment.

Two NSAs lie with the south-east of the study area; Fleet Valley NSA lies approximately 15.1 km from the nearest turbine and East Stewartry Coast NSA lies approximately 38 km away. The ZTV shows no visibility across both NSAs and therefore adverse effects are unlikely to occur. It is therefore proposed that NSAs are scoped out of the detailed assessment.

5.7 Questions for Consultees

- Are there any additional guidance documents that should be taken into consideration in relation to landscape and visual matters?
- Do consultees agree with the proposed approach?
- Do consultees agree with the proposed study areas?
- Do consultees agree with the proposed viewpoint list?
- Are consultees aware of any additional cumulative schemes that should be taken into consideration?
- Do consultees agree with the matters scoped out?
- Can Consultees confirm that they are content with the cumulative LVIA assessing Fell Variation and Cornharrow Variation, rather than the original consented Fell and Cornharrow schemes?

5.8 Figures

- Figure 5.1 – Landscape Policy Context
- Figure 5.2 – Zone of Theoretical Visibility (ZTV) Study – Bareground (45 km)
- Figure 5.3 – Zone of Theoretical Visibility (ZTV) Study – Including Woodlands and Settlements (45 km)
- Figure 5.4 – Combined Landscape Policy Context and Zone of Theoretical Visibility (ZTV) Study - Including Woodlands and Settlements (45 km)
- Figure 5.5 – Cumulative Developments Within 35 km

6 Cultural Heritage and Archaeology

6.1 Introduction

The 'cultural heritage' of an area comprises archaeological sites, historic buildings, Inventoried Gardens and Designed Landscapes (GDLs), Inventoried Battlefields and other historic environment features. Alongside its inherent values, the 'setting' of an asset may also contribute to its cultural heritage significance.

The cultural heritage impact assessment will: identify cultural heritage assets that may be subject to significant effects, both within the limits of the Proposed Development and within a surrounding radius of 10 km; establish the potential for currently unknown archaeological assets to survive buried within the Site; assess the predicted effects on these assets; and propose a programme of mitigation where appropriate. It will consider direct effects (such as physical disturbance), indirect effects (such as might result from change to setting), and cumulative effects (where assets affected by the Proposed Development are also likely to be affected by other unrelated development proposals).

The proposed approach to the assessment of effects on cultural heritage is set out below. The assessment will be undertaken by Beth Gray MA (Hons) ACIfA, Associate Heritage Consultant, SLR Consulting Ltd.

6.2 Legislation, Policy and Guidance

6.2.1 Legislation

The assessment will be undertaken in accordance with the following principal relevant legislation:

- The Ancient Monuments and Archaeological Areas Act 1979;
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997;
- The Historic Environment (Amendment) (Scotland) Act 2011; and
- The EIA Regulations.

6.2.2 Policy

The Scottish Government and Historic Environment Scotland (HES) have issued a number of statements of policy with respect to dealing with the historic environment in the planning system:

- National Planning Framework 4 (NPF4; 2023);
- Historic Environment Policy for Scotland (HEPS 2019) and
- Dumfries and Galloway Local Development Plan (2019).

6.2.3 Guidance

Relevant guidance and technical standard documents comprise:

- HES Guidance on Managing Change in the Historic Environment: Setting (2020);

- Planning Advice Note 2/2011: Planning and Archaeology;
- A Guide to Climate Change Impact: On Scotland's Historic Environment (2019);
- Onshore Wind Turbines: Planning Advice (2014);
- Our Past, Our Future (2023);
- NatureScot and HES Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment Process in Scotland (2019); and
- Chartered Institute for Archaeologists Standard and Guidance for Historic Environment Desk Based Assessment (2014, updated 2017).

6.3 Assessment Methodology

The assessment methodology to be adhered to for purposes of preparing the EIA Chapter is detailed below.

6.3.1 Study Area

For purposes of this assessment, a Study Area has been defined extending 10 km from the proposed turbines.

6.3.2 Scope

6.3.2.1 Assets within the Site

Designated and non-designated assets within the Site will be assessed in order to determine any direct (physical) and indirect (non-physical) impacts. Should the D&G Council Archaeological Officer identify any non-designated assets that they consider to be of national/regional significance, and which they consider derive significance from their setting, these should be made known to the Developer via consultation.

6.3.2.2 Assets outwith the Site

All nationally significant designated assets (**Appendix 6.1**) outwith the Site but within the Study Area will be subject to setting assessment in order to determine any indirect (non-physical) impacts.

6.3.3 Consultation

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

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

6.3.4 Field Surveys

A targeted site inspection will be carried out in relation to those recorded assets likely to be impacted by the Proposed Development; the aim of this would be to establish the condition of any recorded assets and identify the potential for any additional presently unrecorded assets.

Targeted field inspection of other assets will also be undertaken following a desk-based comparison of asset mapping with ZTV and satellite imagery; the aim of this would be to identify and inspect any designated heritage assets potentially susceptible to indirect impact as a result of change to setting under the Proposed Development.

6.3.5 Assessment of Impact

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

In accordance with the EIA Regulations, this assessment will identify any development effects as either direct or indirect, adverse or beneficial, and short-term, long-term or permanent.

Assessment will be undertaken separately for direct impact and indirect impact. Direct impacts are those which would change the heritage significance of an asset through physical alteration; indirect impacts are those which would affect the heritage significance of an asset by causing change within its setting.

Direct impacts upon the significance of heritage assets will take into account the level of their heritage significance (where known) and the magnitude (extent) of the identified impacts.

Indirect impacts on the significance of heritage assets will be identified and assessed with reference to Managing Change in the Historic Environment: Setting (HES 2020) and the guidance set out by NatureScot and HES (2019). Assessment will be carried out in the following stages:

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

6.3.6 Zone of Theoretical Visibility (ZTV)

The settings assessment will be assisted by a ZTV calculation, presented in **Figure 6.2**. A ZTV calculation maps the predicted degree of visibility of a Proposed Development from all points within a proportionate, defined study area around the Site, as would be seen from an average observer's eye level (two metres above

ground level). The ZTV model presented in **Figure 6.2** is based upon the maximum level of theoretical visibility, i.e., the maximum height of the turbine blade tips.

6.3.7 Cultural Heritage Significance

The categories of cultural heritage significance to be referred to are presented in **Table 6.1 below**, which will act as an aid to consistency in the exercise of professional judgement and provide a degree of transparency for others in evaluating the conclusions drawn.

The significance categories take into account factors such as: designation, status and grading. For non-designated assets, consideration will be given to their inherent heritage interests, intrinsic, contextual, and associative characteristics as defined in Annex 1 of HEPS (2019b). In relation to these assets, the assessment will focus upon an assessment of the assets' inherent capability to contribute to our understanding of the past; the character of their structural, decorative and field characteristics as informed by the HER and Canmore records and / or site visit observations; the contribution of an asset to their class of monument, or the diminution of that class should an asset be lost; and how a site relates to people, practices, events, and/or historical or social movements. Assessments of the cultural significance of specific assets, where recorded within the HER, will be taken into account where appropriate.

Table 6.1 Cultural Heritage Significance

Cultural Heritage Significance	Criteria
Highest	Sites of international importance, including: • World Heritage Sites.
High	Site of National importance, including: • Scheduled Monuments; • Category A Listed Buildings; • Gardens and Designed Landscapes included on the national inventory; • Designated Battlefields; and • Non-designated assets of equivalent significance.
Medium	Sites of Regional/local importance, including: • Category B and C Listed Buildings; • Some Conservation Areas; and • Non-designated assets of equivalent significance.
Low	Sites of **minor** importance or with little of the asset remaining to justify a higher importance.
None	Sites that are of no heritage significance.
Unknown	Further information is required to assess the significance of these assets.

6.3.8 Magnitude of Impact

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

Changes could potentially include direct change (e.g., ground disturbance), and indirect change (e.g., change to setting); this latter might include visual change, as well as noise, vibration, smell, dust, traffic movements etc. Effects may be beneficial or adverse, and may be short term, long term or permanent.

The magnitude of any impacts will be assessed using professional judgment, with reference to the criteria set out in **Table 6.2 below**.

Table 6.2 Magnitude of Impact

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

Magnitude of impact	Explanatory criteria
Medium Adverse	The Proposed Development will erode, to a clearly discernible extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect effect might be considered to affect the integrity of the asset's setting.
High Adverse	The Proposed Development will considerably erode the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect effect would probably be considered to affect the integrity of the asset's setting.

6.3.9 Level of Effect

The categories of effect referred to, and the criteria used in their determination, are presented in **Table 6.3 below**.

Table 6.3 Description of Level of Effect

Effect	Criteria
Major	Severe harm or enhancement, such as total loss of significance of the asset or of the integrity of its setting, or exceptional improvement of the cultural heritage significance of the asset and/or the ability to understand, appreciate and experience it.
Moderate	Harm or enhancement, such as the introduction or removal of an element that would affect the Cultural heritage significance of the asset and the ability to understand, appreciate and experience it to a clearly discernible extent.
Minor	Harm or enhancement to the asset's cultural heritage significance and/or to the ability to understand, appreciate and experience it to a modest extent, such that the majority of the asset's inherent interests and aspects of setting would be preserved.
Very Minor	Harm or enhancement to the asset's cultural heritage significance and/or to the ability to understand, appreciate and experience it, that is barely discernible.
Nil	The development will not affect the cultural heritage significance of the asset and/or the ability to understand, appreciate and experience it, or would have harmful and enhancing effects of equal magnitude.

Table 6.4 below provides a matrix that relates the cultural heritage significance of the asset to the magnitude of impact on its significance, to produce an overall anticipated level of impact. This assessment will be undertaken separately for direct effects and indirect effects, the latter being principally concerned with effects resulting from change to the setting of heritage assets.

Table 6.4 Level of Effect

Magnitude of Impact	Cultural Heritage Significance (excluding unknown)			
	Highest	High	Medium	Low
High beneficial	major	major	moderate	minor
Medium beneficial	major	moderate	minor	very minor
Low beneficial	moderate	minor	very minor	very minor
Very low beneficial	minor	very minor	negligible	negligible
Neutral/None	neutral/nil	neutral/nil	neutral/nil	neutral/nil
Very low adverse	minor	very minor	negligible	negligible
Low adverse	moderate	minor	very minor	very minor
Medium adverse	major	moderate	minor	very minor
High adverse	major	major	moderate	minor

6.3.10 Mitigation

Where adverse effects on cultural heritage assets are identified, measures to prevent, reduce and/or, where possible, offset these effects, will be proposed. Potential mitigation measures can be discussed in terms of direct and indirect impact.

Suitable measures for mitigating direct impacts might include:

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

Suitable measures for mitigating any indirect impacts might include:

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

6.3.11 Residual Impact

Residual impacts are those that remain even after the implementation of suitable mitigation measures. Residual impacts will be identified, and the level of those residual impacts defined with reference to **Table 6.4**.

6.3.12 Cumulative Impact

A cumulative effect is considered to occur when there is a combination of:

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

Consideration of other developments will be limited to:

- wind farm planning applications that have been submitted and have a decision pending; and
- wind farm planning applications that have been granted permission but not yet constructed.

Any impact resulting from operational wind farms would be considered as part of the baseline impact assessment.

Cumulative impact would be considered in two stages:

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

6.3.13 Defining Effects as either 'Significant' or 'Not Significant'

Once the anticipated residual and cumulative impacts (effects) of the Proposed Development upon cultural heritage assets have been defined, professional judgment will be used to determine whether those impacts would be either 'Significant' or 'Not Significant' for purposes of EIA. As part of this determination process, regard will be had to any relevant guidance.

With reference to the matrix presented in **Table 6.4**:

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

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

6.4 Pre-Application Consultation, Site Visit & Design Response

6.4.1 Pre-application Consultation with HES

Pre-application consultation was undertaken between the Developer and HES on the 17th of March 2023. During this consultation, HES expressed significant concerns, including in relation to those designated assets within the Site, specifically:

- The Thieves, Standing Stone (**SM1044**);
- Drumfern, Cairn and Stone Circle (**SM1019**);
- Nappers Cottage, Chambered Cairn (**SM5676**); and
- Dalvaird Cairn (**SM1015**).

HES raised concerns that the impacts on the assets from the Proposed Development will raise issues in the national interest and would be such to object to the proposals. HES indicated siting of assets in the north-west, north-east parts of the Site may be possible.

It was noted that concern was raised for direct impact on scheduled monuments however, design has taken into account the monuments and a 250m buffer applied to the monuments. No direct physical impact shall occur on scheduled monuments under the Ancient Monuments Act (1979).

Assets within 10 km have been preliminarily assessed in **Appendix 6.1**, this Appendix is aimed to create a proportionate scope to the development and is an ever-evolving document throughout the EIA process. Assets scoped in may be scoped out and vice versa dependant on the final layout as a result of consultee comments.

Other assets that have been raised by HES are;

- Cordorcan, Cairn (**SM10385**);
- Garlies Castle (**SM7916**);
- Boreland, chambered cairn (**SM1004**);
- Drumwhirn, cairn N of Boreland (**SM1021**);
- Skaith Mote, motte 700m SSW of Challoch (**SM2023**);
- Cairnsmore of Fleet, cairn (**SM2316**);
- Machars Hill, motte (**SM1126**);
- White Cairn, chambered cairn 630m W of Glentrool School (**SM1049**);
- White Cairn, cairn 910m NNE of Bargrennan Cottage (**SM1048**);
- Deil's Dyke, linear earthwork, Hill of Ochiltree (**SM1966**); and
- Cairn Kinna, two cairns 960m ESE of Corrafeckloch (**SM1008**).

Assets that fall out of the proposed study area, the ZTV and that do not have a third viewpoint that contributes to the significance of the monument have been scoped out of assessment. At present, the assets which are scoped out of assessment, and which correlate to the above list are, Skaith Mote (**SM2023**) and Cairn Kinna (**SM1008**).

Skaith Motte (**SM2023**), is scoped out of assessment due to its significance deriving from its use of the lowland landscape with views along the river to assist in its control of movement in the area. Whilst visible the Proposed Development will not impede on the key views of the river valley. Further justification is provided in **Appendix 6.1**.

Cairn Kinna (**SM1008**) currently falls outside of the proposed study area and has not been included for appraisal. However, upon inspection, the Proposed Development will be visible from the asset. Whilst situated in commercial forestry, its setting derives from being located on the south-western slopes of Balunton Hill, overlooking the tributary and confluence of Creebank Burn. As per the asset's designation description, the significance of the asset primarily relates to its archaeological preservation as well as its uniqueness for its spatial and typological characteristics. The asset lies in an area of concentrated Round Cairns, a type of cairn that is common to Scotland however, the mix of such cairns and in such close proximity to chambered and examples of Clyde Cairns, gives the opportunity to further the understanding of prehistoric burial practices in the valley. The assets setting which contributes to its significance, including its group value with other assets in the Cree Valley, would not be impacted due to the distance and nature of the setting. The asset's setting, including its relationship with other assets such as White Cairn (SM1048 and SM1049) would still remain intact with the Proposed Development forming part of the distant landscape. For these reasons, it is proposed that SM1008 is scoped out of further assessment.

6.5 Baseline Description

6.5.1 Within the Site Boundary

The Coldstream Burn Archaeologically Sensitive Area (NX 40 70) (ASA) is located within part of the Site. A Council designation the ASA is identified and protected under the D&G Local Development Plan (2019), Policy HE4: 'Archaeologically Sensitive Areas'. A Technical Paper has been prepared to inform and support the application of Policy HE4. With regard to that Technical Paper, ASAs are not cultural heritage assets, in and of themselves, but are applied by the council in order to *'highlight to potential developers of large scale projects… that there is a particular need to consider* [the] *extensive archaeological interests and issues that might arise from their proposals at an early stage'*.

The Technical Paper further provides that detailed surveys may be required ahead of developments within ASAs to 'help inform the proposal in order that archaeological remains can be identified and mapped and to enable recommendations for preservation and mitigation of effects to be made'.

There are five designated assets within the Site, all of which lie within the Coldstream Burn ASA. Four of these are Scheduled Monuments: **SM1015**, **SM1044**, **SM1019** and **SM5576**, while the fifth comprises Drannandow Farmhouse (**LB17056**), a Category B Listed Building.

The contribution made by the setting of these assets to their significance, and the potential for the proposals to adversely affect their cultural significance as a result of change to setting, was given preliminary consideration during the course of the pre-application site visit. A brief discussion of each is provided below.

6.5.1.1 The Thieves, Standing Stones (SM1044)

The monument comprises two standing stones, approximately 2 m in height. The stones are orientated north-east, south-west, and are located approximately 4 m apart. The alignment of the stones has potential astronomical connections, potentially mirroring celestial patterns. This is not an uncommon claim in relation to prehistoric standing stones. The asset is situated on the south westerly slopes of Blair Hill and is intervisible with the stone circle of Drumfern (**SM1019**; see Figure 1). There are clear views of the Cree Valley and the surrounding undulating landscape, particularly to the south-west, from the asset.

Figure 6.1 The Thieves Standing Stone facing south-west

6.5.1.2 Drumfire, Cairn and Stone Circle (SM1019)

The monument consists of a cairn and the remains of a stone circle. The cairn is 10 m in diameter and 0.4 m high, while the stone circle is 26 m in diameter with several surviving stones standing to a height of around 1 m. Drumfern Cairn overlooks a less expansive, undulating landscape, rather than a defined valley. The Cree Valley is not clearly visible from the Site, and long-distance views to the south-west are focal. The cairn at Drumfern shares intervisibility with **SM5676, SM2316, SM1021** and **SM1008.** The stone circle is visible from **SM1044**, but this view is not reciprocal.

6.5.1.3 *Nappers Cottage, Chambered Cairn (SM5676)*

The monument is an oval cairn, of Clyde type. Clyde cairns are characteristic and have a notably regional focus. Nappers Cottage is the only known Clyde Cairn in the Cree Valley. The monument is situated at 200 m aOD, beneath the steep easterly slopes of Nappers. Located between the burns of Coldstream (0.3 km to the south) and Stramminon (0.3 km to the north-west), it overlooks the valleys to the south-west and north-west. It has clear associations with Drumfern (**SM1019**) and Drumwhirm (**SM1021**), such intervisibility being common to cairns of this period.

6.5.1.4 *Dalvaird, Cairn (SM1015)*

The monument comprises a prehistoric burial cairn, visible as an upstanding mound, circa 0.9 m in height. The cairn measures approximately 14 m by 11 m in plan and is of sub-oval morphology. There is a modern (walkers') cairn built in the centre. The asset appears to be unexcavated, and any future investigation would be likely to enhance our knowledge of regional prehistoric ritual and funerary practices.

The asset is situated approximately 60 m south-east of Cordorcan Burn, which runs downhill to the south-west, at approximately 220 m AOD. The Cordorcan Burn converges with the River Cree, approximately 3.5 km to the south-west of the asset. The Black Burn, a tributary of the Cordorcan Burn, runs approximately 0.15 km to the south of the asset.

6.5.1.5 *Drannandow, Farmhouse (LB17056)*

Drannandow Farmhouse is a Category B Listed Building, built in the early to mid-19th century. The building was constructed as a farmhouse and is single storied, with an asymmetrical gabled attic. The farmhouse is constructed in squared and snecked whin masonry, with bull-faced granite margins and long and short quoins. The roof of the farmhouse comprises graded grey slates.

6.5.1.6 *Non-designated Cultural Heritage Assets*

Preliminary work has revealed 18 prehistoric assets within the Site, as well as a high proportion of agricultural assets of medieval and post medieval date.

Full details of these non-designated cultural heritage assets can be found in **Appendix 6.2** and detailed in **Figure 6.1**.

6.5.2 Outwith the Site Boundary

The following cultural heritage assets, located within the landscape surrounding the Proposed Development Site, have been identified for detailed setting assessment, given the potential for the Proposed Development to affect their cultural significance as a result to change to setting:

- Garlies Castle (SM7916);
- Boreland, Cairn (SM1004);
- Drumwhirn, Cairn (SM1021):
- Cordorcan, Cairn (SM10385);

- Machars Motte (SM1126);
- White Cairn (SM1048);
- White Cairn (SM1049);
- Deil's Dike (SM1966); and
- Cairnsmore of Fleet, Cairn (SM2316).

6.5.3 Key Considerations

The assets listed in Section 6.5.1 and 6.5.2 will be included for detailed setting assessment.

Those for which detailed visualisations are proposed to be prepared are set out in **section 6.5.4**.

6.5.4 Visualisation

Following the pre-application consultation, **Table 6.5 below** sets out the cultural heritage assets for which detailed visualisations are proposed to be prepared and illustrated on **Figure 6.3**.

Table 6.5 Proposed Visualisations

Asset	Visualisation Type	Proposed Location (Easting, Northing)
The Thieves, Standing Stones (SM1044)	Photomontage	240439, 571598
Drumfern, Cairn (SM1019)	Photomontage	239965, 570984
Nappers Cottage, Cairn (SM5676)	Photomontage	240852, 571351
Dalvaird, Cairn (SM1015)	Photomontage	240758, 572991
Drannandow, Farmhouse (LB17056)	Photomontage	238858, 570193
Garlies Castle (SM7916)	Photomontage from approach to the Castle.	242157, 569120
Boreland, Cairn (SM1004)	Site photography	N/A
Drumwhirn, Cairn (SM1021)	Wireline	239352, 568852
Cordorcan, Cairn (SM10385)	Photomontage	239621, 572433
Machars Motte (SM1126)	Site Photography	N/A
White Cairn (SM1048) White Cairn (SM1049)	Wirelines	234234, 579093
Deil's Dike (SM1966)	Wirelines	232589, 573924
Cairnsmore of Fleet, Cairn	Photomontage	250121, 567049

Asset	Visualisation Type	Proposed Location (Easting, Northing)
(SM2316)		

6.6 Matters Scoped Out

On the basis of the work undertaken to date, the professional judgement of the cultural heritage team, and experience of other comparable projects, it is considered that indirect and cumulative impacts of the Proposed Development on Conservation Areas, and on Category B and C Listed Buildings can be scoped out of the EIA in relation to cultural heritage. As per best practice guidance within NatureScot and HES (2019), Category C Listed Buildings are of local rather than national or regional importance, unless in the opinion of an assessor the designation should be higher.

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

6.7 Questions for Consultees

- Do consultees agree with the methodology set out?
- Do consultees agree with the assets and matters scoped out?
- Are there any other assets that consultees believe to warrant that consideration and why?
- Do consultees agree with the proposed visualisations, their type and locations?

6.8 Figures

- Figure 6.1: Cultural Heritage assets within the Proposed Development
- Figure 6.2: Designated Cultural Heritage Assets
- Figure 6.3: Cultural Heritage Viewpoints
- Figure 6.4: Viewpoint 1: Deils Dike (SM1966)
- Figure 6.5: Viewpoint 2: Garlies Castle (SM7916)
- Figure 6.6: Viewpoint 3: Dalvaird Cairn (SM1015)
- Figure 6.7: Viewpoint 4: The Thieves Standing Stones (SM1044)
- Figure 6.8: Viewpoint 5: Drumfern, Cairn and Stone Circle (SM1019)
- Figure 6.9: Viewpoint 6: Nappers Cottage (SM5676)
- Figure 6.10: Viewpoint 7: Cordorcan, Cairn (SM10395)

7 Ecology

7.1 Introduction

This section defines the proposed methodology for the ecological assessment that will be included within the EIA Report. It also details the methods that will be used to establish the baseline conditions within the Site and its surroundings, and the process used to determine the sensitivity of the habitats and species' populations present.

The ways in which habitats or species might be affected (directly or indirectly) by the construction and operation of the Proposed Development will be assessed prior to and after any mitigation measures are considered. In addition, any relevant cumulative effects will be considered, taking together effects of other wind farm projects in the area, whether operational, consented or at application stage, along with the significance of any predicted effects associated with the Proposed Development.

7.2 Baseline Description

Baseline ecological conditions have been established from the following sources:

- information from the National Biodiversity Network (NBN) Atlas (National Biodiversity Network Atlas Scotland, 2022) on ecological records within 5 km of the Site within the last 15 years (since 2008);
- information from the Carbon and Peatland Map 2016 (Scottish Government, 2022);
- information from the Deer Distribution Survey by the British Deer Society (British Deer Society, 2016); and
- a desk study to confirm the location and qualifying features of designated sites within potential zones of influence of the Proposed Development (NatureScot, 2023).

A search of the NBN Atlas showed that the following protected or notable species were recorded within 5 km of the Site since 2008, these are shown in **Table 7.1**:

Table 7.1 National Biodiversity Network records (2008 – 2023) for Protected and Notable species within 5 km of the Site

Common name	Scientific name	Relevance	License	Rightsholder (Recorder)
Brown hare	*Lepus europaeus*	Protected species (during the close season)	CC-BY	The Mammal Society and Biological Records Centre (K. Peace)
Pine marten	*Martes martes*	Protected species	CC-BY	The Mammal Society and Biological Records Centre (K. Peace)
Brown long-	*Plecotus*	Protected species	OGL	Scottish National

Common name	Scientific name	Relevance	License	Rightsholder (Recorder)
eared bat	*auratus*			Heritage/British Trust for Ornithology (Southern Scotland Bat Survey)
Common pipistrelle	*Pipistrellus pipistrellus*	Protected species	OGL	Scottish National Heritage/British Trust for Ornithology (Southern Scotland Bat Survey)
Soprano pipistrelle	*Pipistrellus pygmaeus*	Protected species	OGL	Bat Conservation Trust and Biological Records Centre (C. Gebhardt), Scottish National Heritage/British Trust for Ornithology (Southern Scotland Bat Survey)
Daubenton's bat	*Myotis daubentonii*	Protected species	OGL	Scottish National Heritage/British Trust for Ornithology (Southern Scotland Bat Survey)
Leisler's bat	*Nyctalus leisleri*	Protected species	OGL	NatureScot, Scottish National Heritage/British Trust for Ornithology (Southern Scotland Bat Survey)
Noctule bat	*Nyctalus noctula*	Protected Species	OGL	Scottish National Heritage/British Trust for Ornithology (Southern Scotland Bat Survey)
Natterer's bat	*Myotis nattereri*	Protected species	OGL	Scottish National Heritage/British Trust for Ornithology (Southern Scotland Bat Survey)
Red squirrel	*Sciurus vulgaris*	Protected species	CC-BY	Scottish Wildlife Trust (Numerous Recorders), The Mammal Society and Biological Records Centre (D. Doolan, D. Crawley, K. Peace)
Fallow deer	*Dama dama*	Notable species	CC-BY	The Mammal Society and Biological Records Centre (K.

Common name	Scientific name	Relevance	License	Rightsholder (Recorder)
				Peace)
			OGL	BTO (Withheld)
Red deer	*Cervus elaphus*	Notable species	CC-BY	The Mammal Society and Biological Records Centre (C. Milligan)
Roe deer	*Capreolus capriolus*	Notable species	CC-BY	The Mammal Society and Biological Records Centre (K. Peace), BTO (Witheld)
Palmate newt	*Lissotriton helveticus*	Notable species	CC-BY	Biological Records Centre (G. Chambers, J. Logan, J. Martin)
Common lizard	*Zootoca vivipara*	Protected species	CC-BY	Biological Records Centre (G. Chambers, I. Leach, J. Martin, J. Noad)
Slow worm	*Anguis fragilis*	Protected species	CC-BY	Biological Records Centre (J. Noad)

Table 7.2 contains the invasive non-native species which were returned by these search parameters.

Table 7.2 National Biodiversity Network records (2008 - 2023) for Invasive Non-Native Species within 5 km of the Site

Common name	Scientific name	Relevance	Licence	Rightsholder (Recorder)
Grey Squirrel	*Sciurus carolinensis*	Invasive Non-Native Species	CC-BY	Scottish Wildlife Trust (Numerous Recorders)
Japanese Knotweed	*Fallopia japonica*	Invasive Non-Native Species	CC-BY	Botanical Society of Britain and Ireland and Biological Records Centre (D. Gaffrey, M. Pollitt)

As per **Figure 7.1**, the Carbon Peatland Map 2016 shows three small areas of Class 1 peatland within the Site along the north-eastern border and south-eastern sections of the Site, with a single area of Class 2 peatland located within the north-west; all proposed turbine locations are outwith areas mapped as Class 1 or Class 2 peatland. Areas of Class 3 peatland are located throughout the Site with a large area of Class 4 peatland extending from the north into the central and south-western sections. The south-western and south-eastern sections contain large areas of Class 5 peatland with smaller areas of Class 3 peatland. The map suggests that much of the southern portion of the Site is composed of Class 5 peatland, with a small area of Class 0 mineral soil along the south-western boundary.

The Deer Distribution Survey results showed that the following deer species are likely to be present or have previously been recorded in the wider area of the Site:

- fallow deer (reconfirmed in 2016, recorded in 2007 and/or 2011);
- red deer (reconfirmed in 2016, recorded in 2007 and/or 2011); and
- roe deer (reconfirmed in 2016, recorded in 2007 and/or 2011).

There are no statutory designations with ecological features within the Site. There are two Special Area of Conservation (SACs), five Sites of Special Scientific Interest (SSSIs) and one National Nature Reserve (NNR) within 5 km of the Site that contain ecological features. These are listed in **Table 7.3** and shown on **Figure 7.1**.

Table 7.3 Designated Sites with Ecological Qualifying Features within 5 km of the Site

Designated Site	Qualifying Ecological Features	Condition of Feature (and Date Monitored)	Distance from Site (km)
Galloway Oakwoods SAC	Western acidic oak woodland	Favourable Maintained (May 2009)	0.0 (adjacent to Site's western boundary)
Wood of Cree SSSI	Upland oak woodland Oligotrophic loch	Unfavourable Recovering (June 2014) Favourable Maintained (July 2009)	0.0 (adjacent to Site's western boundary)
Glentrool Oakwoods SSSI	Upland oak woodland Bryophyte assemblage Lichen assemblage	Favourable Maintained (May 2009) Favourable Maintained (October 2012) Unfavourable Declining (June 2014)	2.08
Cairnsmore of Fleet NNR	Blanket bog, Upland assemblage Upland assemblage	Blanket bog Unfavourable Recovering (December 2006) Upland assemblage Favourable Maintained (January 2005)	2.81
Cairnsmore of Fleet SSSI	Blanket bog, Upland assemblage Upland assemblage	Blanket bog Unfavourable Recovering (December 2006) Upland assemblage Favourable Maintained (January 2005)	2.81
Merrick Kells SAC	Acid peat-stained lakes and ponds Acidic scree	Favourable Maintained (July 2004) Favourable Maintained	4.02

Designated Site	Qualifying Ecological Features	Condition of Feature (and Date Monitored)	Distance from Site (km)
		(September 2010)	
	Blanket bog	Unfavourable Recovering (September 2009)	
	Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	Favourable Maintained (July 2009)	
	Depressions on peat substrates	Favourable Recovered (September 2009)	
	Dry heaths	Favourable Recovered (August 2013)	
	Montane acid grasslands	Unfavourable No Change (August 2013)	
	Otter (Lutra lutra)	Favourable Maintained (April 2012)	
	Plants in crevices on acid rocks	Favourable Maintained (August 2013)	
	Wet heathland with cross-leaved heath	Unfavourable Recovering (September 2009)	
Merrick Kells SSSI	Blanket bog	Favourable Recovered (August 2013)	4.02
	Beetle assemblage	Favourable Maintained (September 2015)	
	Upland assemblage	Unfavourable No Change (August 2013)	
	Blue aeshna dragonfly (*Aeshna caerulea*)	Favourable Maintained (October 2017)	
Lower River Cree SSSI	Smelt (*Osmerus eperlanus*)	Favourable Maintained (March 2004)	4.20

The Galloway Oakwoods SAC lies directly adjacent to the Site. The qualifying ecological feature for Galloway Oakwoods SAC is Western acidic oak woodlands. Embedded mitigation measures (including Site design and layout; e.g. see **Figure 7.1**) and the application of a Construction Environmental Management Plan (CEMP), will avoid or minimise any adverse effects on the qualifying ecological features of the designated site. As a result, likely significant effects from the Proposed Development can be scoped out as such, and the Proposed Development would not be subject to a Habitats Regulations Appraisal (HRA) under the The Habitats Regulations at this stage.

Wood of Cree SSSI lies adjacent to the Site. The adoption of embedded mitigation measures including Site design and layout and the implementation of a CEMP during the construction stage, are likely to avoid any adverse effects on the qualifying ecological features of the Wood of Cree SSSI and assessment of effects on this designated site is scoped out at this stage.

Lower River Cree SSSI is hydrologically connected to the Site through the Cordoran Burn which runs along the northern border of the Site and the Black Burn which runs through the Site. Although the Site is hydrologically connected to the Lower River Cree SSSI, the adoption of embedded mitigation measures (including Site design (e.g., 50 m watercourse buffers) and CEMP), are likely to avoid any adverse impact upon the qualifying ecological feature of the SSSI (smelt) and assessment of effects on this designated site is scoped out at this stage.

Merrick Kells SAC is 4.02 km from the Site and has no topographical or hydrological connectivity with the Site. Therefore, any likely significant effects from the Proposed Development can be scoped out as such and the Proposed Development would not be subject to a Habitats Regulations Appraisal (HRA) under The Habitats Regulations.

All of the remaining sites are located outside the Site (as shown **Table 7.3** and **Figure 7.1**) and have no connectivity with the Site. Therefore, when taking into consideration the nature of the qualifying ecological interests of each designated site, the adoption of embedded mitigation (e.g. Site design and CEMP), it is highly unlikely that any adverse impacts will occur to the designated sites and assessment of effects on those designated sites are scoped out at this stage.

The Ancient Woodland Inventory (AWI) shows three small sections of ancient woodland which lie within the access track corridor of the Site. Areas of ancient woodland within 5 km of the Site are numerous, with most of these concentrated to the west and south of the Site. A large area of ancient woodland borders the Site to the south-west, much of which overlaps with Galloway Oakwoods SAC and Wood of Cree SSSI (**Figure 7.1**).

Seasonal static bat detector (Anabat) surveys following NatureScot *et al*. (2021) guidelines are currently in progress. Eighteen Anabats have been deployed around the Site, with the deployments beginning in May 2023 and due to be concluded in October 2023. The locations were selected based on an indicative layout and positioned such as to cover the area in which the turbines are proposed to be located (as per NatureScot *et al*. (2021).

Further baseline information will be obtained from a suite of ecology surveys. The surveys to be conducted are summarised as follows:

- Protected species walkover surveys including a ground based Preliminary Roost Assessment (PRA) for bats within the Site will be undertaken 2023;
- National Vegetation Classification (NVC) surveys, incorporating Phase 1 Habitat and potential Groundwater Dependent Terrestrial Ecosystem (GWDTE) habitat characterisation were undertaken in 2022 with further surveys due in 2023; and
- Electrofishing and fish habitat suitability surveys on watercourses within the Site, in line with guidance and in consultation with the Galloway Fisheries Trust (GFT), due in autumn 2023.

7.3 Legislation, Policy and Guidance

The assessment will be undertaken in line with the following European and National Legislation:

- European Union Council Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (Habitats Directive);
- European Union Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy ("Water Framework Directive");
- Environmental Impact Assessment Directive 85/337/EEC, as amended ("EIA Directive"), (as subsequently codified by Directive 2011/92/EU, and as amended by Directive 2014/52/EU);
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations);
- Nature Conservation (Scotland) Act 2004 (as amended);
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) 'The Habitats Regulations');
- The Protection of Badgers Act 1992;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011
- The Wildlife and Countryside Act 1981 (as amended); and
- The Wildlife and Natural Environment (Scotland) Act 2011 (WANE).

The assessment will be carried out in accordance with the principles contained within the following guidance and policy documents:

- Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (version 1.1). Chartered Institute of Ecology and Environmental Management, Winchester;
- Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust;
- Dumfries and Galloway Council (2009) Local Biodiversity Action Plan;
- European Commission (2020) Guidance document on wind energy developments and EU nature legislation;
- JNCC and Defra (on behalf of the Four Countries' Biodiversity Group) (2012) UK Post-2010 Biodiversity Framework. July 2012;
- Joint Nature Conservation Committee (JNCC) (2013) Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);

- NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019, with minor updates 2021). Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation;
- NatureScot (2020) General Pre-application and Scoping Advice to Developers of Onshore Wind Farms;
- Scottish Badgers (2018) Surveying for Badgers: Good Practice Guidelines. Version 1.
- Scottish Executive (2000) Nature conservation: implementation in Scotland of EC Directives on the conservation of natural habitats and of wild flora and fauna and the conservation of wild birds ('The Habitats and Birds Directives'). Revised guidance updating Scottish Office Circular no. 6/1995;
- Scottish Environment Protection Agency (SEPA) (2017) Land Use Planning System Guidance Note 4 - Planning guidance on on-shore windfarm developments;
- SEPA (2017) Land Use Planning System Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems;
- Scottish Government (2001). European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements.
- Scottish Government (2006). European Protected Species – terms of guidance: Chief Planner letter.
- Scottish Government (2013) Scottish Biodiversity Strategy: It's in Your Hands (2004)/2020 Challenge for Scotland's Biodiversity (2013);
- Scottish Government (2016) Draft Peatland and Energy Policy Statement;
- Scottish Government (2017a) Planning Advice Note 1/2013 - Environmental Impact Assessment, Revision 1.0;
- Scottish Government (2017b) Planning Circular 1/2017: Guidance on The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Scottish Government (2018) Climate Change Plan: Third Report on Policies and Proposals 2018-2032;
- Scottish Government (2020) Scottish biodiversity strategy post-2020: statement of intent;
- Scottish Government (2023) National Planning Framework 4;
- SNH (2015) Scotland's National Peatland Plan;
- SNH (2016a) Planning for Development: What to consider and include in deer assessments and management at development sites (Version 2);
- SNH (2016b) Planning for Development: What to consider and include in Habitat Management Plans. Version 2;
- SNH (2018a). Advising on carbon-rich soils, deep peat and priority peatland habitat in development management;
- SNH (2018b) Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland; and

- Scottish Renewables, SNH, SEPA, Forestry Commission (Scotland), HES, AEECoW (2019) Good Practice During Windfarm Construction (4th Edition).

7.4 Assessment Methodology

The EIA Report will incorporate the following study areas:

- designated sites: the Proposed Development and a 5 km study area;
- protected species: the Proposed Development and any species-specific buffers as necessary;
- electrofishing surveys (carried out by local fisheries trust): watercourses onsite and downstream as deemed relevant;
- potential bat roost features: the Proposed Development and a 200 m plus turbine blade length buffer (as per NatureScot 2021) study area;
- habitats and potential GWDTE: the Site;
- bat collisions: the Site, static bat data will be processed through Ecobat (Mammal Society 2017); and
- cumulative assessment (if required): the Proposed Development and a 5 km study area.

A desk-based study will be completed to provide any historic ecological data within the Site and surrounding area, which will be considered in the assessment.

The following data sources will be consulted as part of the assessment:

- South West Scotland Environmental Information Centre (SWSEIC);
- Galloway Fisheries Trust;
- The NBN Atlas [https://nbnatlas.org/];
- The Ancient Woodland Inventory (Scotland);
- The Deer Distribution Survey (2016) results by the British Deer Society;
- Saving Scotland's Red Squirrels website for red and grey squirrel sightings;
- The SNH Carbon and Peatland Map 2016; and
- Any ES, EIARs or technical reports from other developments or Proposed Developments in the local area.

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

The assessment will include the following elements:

- baseline conditions;
- scoping in/out of ecological features and impacts;

- assessment of potential impacts and effects on IEFs during construction and operational phases;
- cumulative effects;
- mitigation; and
- summary of significant residual effects.

Effects on IEFs will be assessed in relation to the species' reference population or habitat extent, conservation status, range, and distribution. The assessment of potential effects will be informed by guidelines published by CIEEM (2018) and NatureScot (see also **Section 7.3: Legislation, Guidance and Policy**).

The assessment involves the following process:

- identifying potential impacts of the Proposed Development;
- considering the likelihood of occurrence of potential impacts;
- defining the nature conservation value (NCV) and conservation status of relevant populations for each IEF to determine overall sensitivity;
- establishing the magnitude of the likely impact (both spatial and temporal) on each IEF;
- based on the above information, making a judgement as to whether or not the consequent potential effect would be significant with respect to the EIA Regulations;
- if a potential effect is determined to be significant, measures to avoid or reduce the significance of effects are considered;
- considering opportunities for enhancement where appropriate; and
- concluding residual potential effects after considering mitigation, compensation and enhancement.

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

7.5 Potential Mitigation

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

- a Species Protection Plan (SPP) would be implemented as part of a Construction Environmental Management Plan (CEMP) or similar during the construction phase to ensure that all reasonable precautions are taken to adhere to the relevant wildlife legislation;
- pre- and during-construction surveys carried out by an Ecological Clerk of Works (ECoW) or suitably qualified ecologist would take place as part of the SPP, and an ECoW present during the construction period;

- an Outline Biodiversity Ecological Management Plan (OBEMP) would be developed for the operational phase and agreed with consultees, to mitigate or enhance habitat for IEFs and to provide wider biodiversity benefits; and
- a Biodiversity Net Gain (BNG) assessment of the Proposed Development.

Where unmitigated significant effects on IEFs are identified, additional measures to prevent and reduce these adverse effects would be proposed, in order to conclude a non-significant residual effects.

7.6 Potential Effects

The assessment will consider effects arising from potential impacts associated with construction and operation of the Proposed Development.

Construction impacts that will be considered include:

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

Operational impacts that will be considered include:

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

Decommissioning phase impacts are assumed to be similar to construction impacts, albeit likely with a shorter duration.

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

A summary of the features and impacts to be considered, and the phases for which they are likely to be scoped in or out for, are presented in **Table 7.4**. Decommissioning impacts are not included as they are assumed to be similar to those from construction.

Table 7.4 Summary of Features and Impacts for Ecology

Features	Scoped In		Justification
	Construction	Operation	
Protected species (including bats)	Yes	Yes	Protected species cannot be scoped out until the ecological baseline surveys are complete and the presence and distribution of ecological features in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood.
Habitats on Annex I to the Habitats Directive	Yes	Yes	Habitats on Annex I to the Habitats Directive cannot be scoped out until the ecological baseline surveys are complete and the presence and distribution of such habitats in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood.
Habitats not on Annex I to the Habitats Directive and species not on Annex II to the Habitats Directive and habitats or species not protected by other legislation (e.g., The Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 or The Protection of Badgers Act).	No	No	On the basis of the results of the desk-based work undertaken to date, the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards, generally common and widely distributed habitats or species which do not fall within the categories listed in the feature column will be scoped out of the assessment.

Features	Scoped In		Justification
	Construction	Operation	
Wild deer population	Yes	No	The desk-based study will collate relevant information on the deer populations in the locality to inform whether this should be scoped out or assessed further in the EIAR.
Designated sites	No	No	The Galloway Oakwoods SAC directly adjacent to the Site, and the Merrick Kells SAC is within 5 km of the Site. **Table 7.3** identifies the qualifying ecological features of these sites which are unlikely to be affected by activities during the construction and operational phases of the Proposed Development. As a result, likely significant effects from the Proposed Development can be ruled out as such and the Proposed Development would not be subject to a Habitats Regulations Appraisal (HRA) under The Habitats Regulations. One SSSI (Wood of Cree) is located adjacent to the Site with one further SSSI (Lower River Cree SSSI) also hydrologically connected to the Site. Three SSSIs and one NNR show no topographical or hydrological connectivity with the Site. The adoption of embedded mitigation measures will ensure that it is highly unlikely that any adverse impacts will occur to the designated sites and these are scoped out of the assessment.
Migratory salmonids	Yes	No	Impacts on fish populations cannot be scoped out until the ecological baseline surveys are complete and the presence and distribution species and suitable habitats relation to the planned infrastructure and activities associated with the Proposed Development are fully understood.

7.7 Questions for Consultees

- Do consultees agree that, subject to further information coming to light from the field surveys and desk study, the scope of IEFs to be included in the assessment is appropriate?
- Do consultees agree that the suite of field surveys planned for/undertaken in 2022 and planned for 2023 in addition to a desk study are sufficient to inform a robust impact assessment?
- Do consultees agree that there is no potential for connectivity, or potentially significant effects, between the Proposed Development and the designated sites present within 5 km of the Site, and that consequently effects related to all designated sites can be scoped out of the assessment?
- Do consultees agree that the methodology and scope of assessment is appropriate?

7.8 Figures

- 7.1 Ecological Designated Sites Ancient Woodland and Peatland within 5 km.

8 Ornithology

8.1 Introduction

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

8.2 Baseline Description

Baseline ornithology conditions have been/will be established from the following sources:

- Results of ornithology surveys undertaken between April 2022 and March 2024;
- Greylag goose (Icelandic) and pink-footed goose feeding distributions (Mitchell 2012);
- Information provided by the Dumfries and Galloway Raptor Study Group (DGRSG) – request is in progress; and
- A desk study to confirm the location and qualifying features of designated sites within potential zones of influence of the Proposed Development.

8.2.1 Baseline Surveys

The following surveys have been undertaken to date (June 2023) or will be completed by the end of March 2024. All surveys are undertaken in line with the appropriate guidance (SNH 2017, Hardey *et al*. 2013, Gilbert *et al*. 1998) and survey areas are detailed below. All survey areas were created using survey-specific buffers based on the Proposed Development boundary provided at the time of survey commencement.

- Flight activity surveys (minimum of 36 hours per season as per SNH 2017): four Vantage Point (VP) locations (**Figure 8.1**), April 2022 to March 2023 and five VP locations (**Figure 8.2**), March 2023 to March 2024;
- Scarce breeding bird surveys: 2 km survey area, monthly from April to August 2022 (**Figure 8.1**) and from March to August 2023 (**Figure 8.2**);
- Black grouse surveys: 1.5 km survey area, April and May 2022 (**Figure 8.1**) and April and May 2023 (**Figure 8.2**);
- Breeding wader surveys: 500 m survey area, monthly from April to July 2022 (**Figure 8.1**) and April to July 2023 (**Figure 8.2**); and
- Winter walkover surveys: 500 m survey area, three visits between November 2022 and February 2023 (**Figure 8.1**) and three visits between November 2023 and February 2024 (**Figure 8.2**).

8.2.2 Designated Sites

There are no statutory designations with ornithological features within the Proposed Development. Two Special Protection Areas (SPAs), five Sites of Special Scientific Interest (SSSI) and one Ramsar with ornithological features are within 20 km of the Proposed Development as listed below and detailed on **Figure 8.3**. Note that all distances are from the nearest points of the designation site boundary to the Site as shown on **Figure 8.3**.

- Solway Firth SPA (underpinned by the Cree Estuary SSSI, approximately 7 km from the Site) approximately 13.3 km from the Site and designated for non-breeding barnacle goose, bar-tailed godwit, black-headed gull, common gull, common scoter, cormorant, curlew, dunlin, golden plover, goldeneye, goosander, grey plover, herring gull, knot, lapwing, oystercatcher, pink-footed goose, pintail, red-throated diver, redshank, ringed plover, sanderling, scaup, shelduck, shoveler, teal, turnstone, whooper swan and a waterfowl assemblage.
- Loch Ken and River Dee Marshes SPA (underpinned by the Loch Ken and River Dee Marshes Ramsar), approximately 18.4 km from the Site and designated for non-breeding Greenland white-fronted goose and greylag goose.
- Merrick Kells SSSI, approximately 4 km from the Proposed Development and designated for a breeding bird assemblage.
- Laughenghie and Airie Hills SSSI, approximately 13.8 km from the Proposed Development and designated for a breeding bird assemblage and non-breeding hen harrier.
- Derskelpin Moss SSSI, approximately 15.7 km from the Proposed Development and designated for breeding dunlin and a breeding bird assemblage.
- Mochrum Lochs SSSI, approximately 17.3 km from the Proposed Development and designated for breeding cormorant.

Based on the guidance from NatureScot (SNH 2016a) regarding connectivity with SPAs, there is some potential for connectivity between the Site and the Solway Firth SPA for pink-footed goose (15-20 km foraging range, SNH 2016a) and Loch Ken and River Dee Marshes SPA for greylag goose (15-20 km foraging range, SNH 2016a), however connectivity is likely to be limited when considering the habitats present on the Site and the location of the Site in relation to the SPAs (i.e., situated on upland ground away from the river valley and estuary). The remaining species listed on the Solway Firth SPA citation are designated for their non-breeding/wintering populations and comprise waders, waterfowl and true seabirds that are utilising the coastal/wetland habitats present at the SPA, and there is considered to be no connectivity between these SPA species and the Proposed Development. There is also considered to be no connectivity between the Loch Ken and River Dee Marshes SPA Greenland white-fronted goose population on the basis of their foraging range (5-8 km, SNH 2016a).

8.2.3 Ornithological Activity (Year 1: April 2022 to March 2023)

Flight activity surveys between April 2022 and March 2023 recorded seven target species (black grouse, curlew, golden plover, hen harrier, lapwing, merlin and red kite) collectively accounting for 32 flights which

may be included in the Collision Risk Model (CRM), depending on their location in relation to the final turbine layout.

Surveys during the 2022 breeding season recorded breeding snipe within the 500 m survey area. Wader activity was generally low across the 2022 breeding season, with golden plover being the only other wader species recorded (a flock of 14 birds recorded twice in April – considered to be non-breeding birds on passage). A single curlew and a flock of five lapwing were recorded during flight activity surveys in the 2022/2023 non-breeding season.

Scarce breeding bird surveys during the 2022 breeding season located one barn owl territory (confirmed breeding) within the Site. Goshawk, hen harrier and red kite were recorded during the 2022 breeding season but were not identified to be breeding within the 2 km survey area.

Black grouse were recorded lekking at one location during the 2022 breeding season, with a single male present in April and May. Two males and one female black grouse were recorded during a flight activity survey in the 2022/2023 non-breeding season.

8.2.4 Review of the Baseline Survey Programme

When surveys commenced at the Site in April 2022, the parcel of land comprising of the open ground around Glenmalloch Hill in the south-east of the Proposed Development (area on which T19 to T22 are located) was not included. This area was included at the start of the year 2 surveys in March 2023 and the viewsheds and survey areas were revised to include this area (**Figure 8.2**). Year 1 surveys did provide some coverage of this area with two of the four proposed turbines in this area covered by the year 1 viewsheds (**Figure 8.1**) and the distribution surveys extending over this area to various degrees (**Figure 8.1**).

Guidance from NatureScot (SNH 2017) generally recommends a baseline survey programme of two years in order to ensure any interannual variation is recorded to allow for a robust assessment of effects on ornithology. This will be completed for the majority of the Site; however, it is proposed to only undertake one year of baseline surveys for the additional area added in March 2023. Considering the relatively small size of this additional area and the low ornithological sensitivity of the Site, one year of baseline surveys on the additional area (comprising the 2023 breeding season and 2023/2024 non-breeding season) is considered sufficient and representative to allow for a robust assessment on the potential impacts to ornithology. Confirmation of this approach is sought from NatureScot as part of this Scoping Report.

8.3 Legislation, Policy and Guidance

The assessment will be undertaken in line with the following European legislation and guidance:

- Directive 2009/147/EC on the Conservation of Wild Birds (the EU Birds Directive);
- Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (the Habitats Directive); and
- Environmental Impact Assessment Directive 2014/52/EU (the EIA Directive).

The following national legislation, which has recently been amended as a consequence of EU exit (Scottish Government 2019, 2020), is also considered as part of the ornithology assessment:

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (The Habitats Regulations);
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The EIA Regulations;
- Scottish Government (2000). Planning Advice Note 60: Planning for Natural Heritage; and
- Scottish Government (2017). Planning Advice Note 1/2013-Environmental Impact Assessment, Revision 1.0.

The assessment will consider the relevant aspects of NPF4, Planning Advice Notes and other relevant guidance. Of relevance to ornithology are the following policies:

- UK Post-2010 Biodiversity Framework (2012);
- Scottish Biodiversity Strategy: It's in Your Hands (2004)/2020 Challenge for Scotland's Biodiversity (2013);
- National Planning Framework 4 (NPF4) (February 2023);
- The Scottish Biodiversity List; and
- Scottish Biodiversity Strategy to 2045: Tackling the Nature Emergency in Scotland (2023), note that this is still in draft form with consultation taking place in Spring 2023.

Guidance on the following topics will also be considered:

- Environmental impact assessment: NatureScot (SNH 2016b, 2018a, 2018b, NatureScot 2020), CIEEM (2018), SERAD (2000);
- Designated sites: NatureScot (SNH 2016a), European Commission (2010);
- Collision modelling: NatureScot (SNH 2000, 2018c), Band *et al*. (2007);
- Cumulative assessments: NatureScot (SNH 2018d);
- Bird populations/species specific guidance: Stanbury *et al*. (2021), NatureScot (SNH 2014, 2017), Pearce-Higgins (2021); and
- Construction and birds: NatureScot (SNH 2016c).

8.4 Assessment Methodology

The assessment will consider the potential direct, indirect, and cumulative impacts that the construction and operation of the Proposed Development could have on Important Ornithological Features (IOFs, as per CIEEM 2018 guidance). The assessment will be supported by an Appendix that will include details of survey methodologies, all survey data and outputs from any collision risk modelling.

The assessment will include the following elements:

- Baseline conditions;
- Scoping in/out of ornithological features and impacts;
- Assessment of potential impacts during construction, operational and decommissioning phases;
- Mitigation;
- Residual effects;
- Cumulative impact assessment; and
- Summary of effects.

Consideration of SPAs will be undertaken within an HRA context, with information to inform an appropriate assessment being included, should any likely significant effects to any qualifying features be identified.

Impacts on IOFs will be assessed in relation to the species' reference population, conservation status, range and distribution. The assessment of potential impacts will follow guidelines published by CIEEM (2018) and NatureScot (SNH 2018a, 2018b).

The assessment will involve the following process:

- Identifying potential impacts of the Proposed Development;
- Considering the likelihood of occurrence of potential impacts;
- Defining the nature conservation importance and conservation status of relevant populations for each IOF to determine overall sensitivity;
- Establishing the magnitude of the likely impact (both spatial and temporal) on each IOF;
- Based on the above information, making a judgement as to whether or not the consequent effect is significant with respect to the EIA Regulations;
- If a potential effect is determined to be significant, suggesting measures to mitigate or compensate the effect where required;
- Considering opportunities for enhancement where appropriate; and
- Concluding residual effects after mitigation, compensation, or enhancement.

Where appropriate, the assessment will take into consideration specific measures of analysis, most likely collision risk modelling using the Band *et al*. (2007) model.

8.4.1 Study Area

The EIAR will incorporate the following study areas which will all be buffered from the finalised turbine layout (and access track if relevant/required):

- Designated sites: the Proposed Development and a 20 km study area (SNH 2016a);
- Collision risk modelling: the results of the flight activity surveys will be used to inform collision risk modelling. A Collision Risk Analysis Area (CRAA) will be created using GIS Delaunay triangulation from the proposed turbine locations to create a wind farm area which will then be buffered by 500 m (as per SNH 2017);

- Scarce breeding birds: Proposed Development and a 2 km study area (800 m for access tracks) (SNH 2017);
- Black grouse: Proposed Development and a 1.5 km study area (750 m for access tracks) (SNH 2017); and
- Cumulative assessment: as per SNH (2018d), the Natural Heritage Zone (NHZ) level is considered practical and appropriate for breeding species not connected to designated sites (for the Site, the NHZ will be the Western Southern Uplands, NHZ 19).

8.5 Potential Mitigation

Significant effects on birds will be avoided/minimised where possible during the design process, based on the locations of known nest, roost and lek sites, key foraging areas, and likely sensitivities of IOFs. Good practice (SNH 2016c) during construction and operation of the Proposed Development will also be implemented (and the assessment undertaken on this basis). This will include the following:

- A Bird Disturbance Management Plan (BDMP) will be implemented as part of a Construction Environmental Management Plan (CEMP) or similar during the construction phase, to ensure that all reasonable precautions are taken to adhere to the relevant wildlife legislation;
- Pre- and during-construction surveys carried out by an Ecological Clerk of Works (ECoW) or suitably qualified ornithologist will take place as part of the BDMP; and
- A Biodiversity Enhancement Management Plan (BEMP) will be developed for the operational phase and agreed with consultees, to mitigate or enhance habitat for IOFs and to provide wider biodiversity improvements.

Where unmitigated significant effects on IOFs are identified, additional measures to prevent, reduce and where possible offset these adverse effects will be proposed, in order to conclude a non-significant residual effect.

8.6 Potential Effects

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

Construction/Decommissioning Impacts:

- Temporary and permanent habitat loss/alteration/fragmentation associated with the Proposed Development infrastructure, including loss of nesting, lekking, roosting or foraging habitat; and
- Visual and noise disturbance associated with construction activities.

Operational Impacts:

- Displacement from nesting, lekking, roosting or foraging habitats around operational turbines and other permanent infrastructure, including barrier effects;
- Risk of collisions with operational wind turbine blades or any other permanent infrastructure; and
- Impacts relating to turbine lighting.

8.6.1 Scoped out Features

On the basis of baseline data, experience from other relevant projects and policy guidance or standards (e.g., CIEEM 2018, SNH 2018b), the following species will be 'scoped out' since significant effects are unlikely:

- Common and/or low conservation species not recognised in statute as requiring special conservation measures (i.e., not listed as Annex 1/Schedule 1 species);
- Common and/or low conservation species not included in non-statutory lists (i.e., not listed as Amber or Red-listed BoCC species), showing birds whose populations are at some risk either generally or in parts of their range; and
- Passerine species, not generally considered to be at risk from wind farm developments (SNH 2017), unless being particularly rare or vulnerable at a national level.

Subject to the results of the collision risk modelling, effects relating to any target species not identified to be breeding within the relevant study area will be scoped out of the assessment.

Considering the review of designated sites within 20 km of the Proposed Development, there is considered to be no potential for a likely significant effect on the Solway Firth SPA (with the exception of pink-footed goose), Loch Ken and River Dee Marshes SPA (with the exception of greylag goose), Loch Ken and River Dee Marshes Ramsar, Cree Estuary SSSI, Merrick Kells SSSI, Laughenghie and Airie Hills SSSI, Mochrum Lochs SSSI, or Derskelpin Moss SSSI as a result of the Proposed Development and it is proposed to scope these designated sites out of the assessment.

8.6.2 Scoped in Features

Whilst it is not possible to definitively scope out/in specific target species from/to the assessment prior to undertaking collision modelling and a review of the ornithological baseline against the final design, considering the information available regarding the species assemblage and distribution at the Proposed Development and on the basis of professional experience, it is considered that barn owl, black grouse and red kite are likely to be the species considered as IOFs and therefore scoped into the assessment.

The ornithology Chapter of the EIAR will consider the potential for connectivity between the Proposed Development and the pink-footed goose population associated with the Solway Firth SPA/greylag goose population associated with the Loch Ken and River Dee Marshes SPA. Information to inform a Habitats Regulations Appraisal (HRA) will be presented in the Chapter to inform the appraisal process and (if required) allow the competent authority to conduct an Appropriate Assessment.

8.6.3 Cumulative Effects

An assessment of cumulative effects will be undertaken following published guidance (SNH 2018d). Cumulative effects on each IOF relevant to the Proposed Development will be assessed in relation to other projects and activities subject to the EIA process within a relevant search area and their effects on a relevant reference population; for example, at an NHZ level for breeding species.

8.7 Questions for Consultees

- Do consultees agree that, subject to further information becoming available from the field surveys and desk study, the scope of IOFs (including designated sites) to be included in the assessment is appropriate?
- Do consultees agree that the desk study and the field surveys (April 2022 to March 2024) will provide sufficient data to inform a robust impact assessment?
- Do consultees agree that the methodology and scope of the assessment is appropriate?
- Do consultees believe that there are any further species, or any designated sites which need to be considered in the assessment?
- Are there any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the ornithology assessment?
- Do consultees agree with the features proposed to be scoped out of the assessment?

8.8 Figures

- Figure 8.1: Ornithology Survey Areas – Year 1 (April 2022 to March 2023)
- Figure 8.2: Ornithology Survey Areas – Year 2 (March 2023 to March 2024)
- Figure 8.3: Ornithological Designated Sites within 20 km

9 Geology, Hydrology and Hydrogeology

9.1 Introduction

This Chapter outlines the proposed scope of works of the EIAR to assess the significant effects from the Proposed Development on geology, peat, hydrology and hydrogeology.

9.2 Baseline Description

9.2.1 Surface Hydrology

The Site lies within the surface water catchments of the River Cree and Penkiln Burn (**Figure 9.1**). The River Cree (ID 10520) flows south along the south-western Site boundary. The Cordorcan burn, Black Burn, Washing burn, Coldstream Burn, and Straminnon Burn are tributaries of the River Cree and transverse the Site to drain to the south-west.

The Penkiln Burn (ID 10533) is located outwith the Site boundary to the east, flowing to the south. The tributaries of Pulcree Burn and Glenshalloch Burn drain the east of the Site and eventually drain south into the Penkiln Burn.

The River Cree and the Penkiln Burn confluence south of the Site in Newton Stewart at NGR 241036 566035. According to the SEPA Water Classification Hub, in accordance with the Water Framework Directive (WFD), the River Cree and the Penkiln Burn are both classified as having an overall condition 'Good'.

9.2.2 Superficial Geology

BGS Onshore GeoIndex Mapping indicates the Site is not underlain by superficial deposits across most of the Site (**Figure 9.2**). Devensian stage Till deposits are prevalent in the north, west and east of the Site, concentrated along the Cordorcan Burn and Glenshalloch Burn. There are small areas of peat deposits indicated, however, extensive peat coverage is not indicated across the Site.

9.2.3 Bedrock Geology

BGS Onshore GeoIndex Mapping indicates that the bedrock geology underlying the Site is predominantly wacke sandstone and siltstone turbidite succession of the Shinnel Formation (**Figure 9.3**). There is extensive faulting in the north and north-west of the Site. The Portpatrick Formation (wacke) is located to the north of this, with layers of Moffat Shale Group (mudstone) located along the thrust faults. At the northern boundary of the Site an area of Crawford Group basaltic pillow lava is present. The area has then been intruded by the North Britain Siluro-Devonian Calc-Alkaline Dyke Suite.

9.2.4 Soils and Peat

The National Soil Map of Scotland indicates that the soils underlying the Site comprise mostly peaty gleys with a central area of peaty podzols.

Published priority peatland mapping by NatureScot, Carbon and Peatland Map 2016, indicates that the Site primarily comprises Class 5 peatland (**Figure 9.4**). Class 5 peatlands mean there are no peatland habitats recorded but may include areas of bare soil, carbon-rich soils and deep peat. The remainder of the Site is primarily occupied by Class 3 peatland, with small, isolated areas of Class 1 and Class 2 peatlands in the north. Class 1 and Class 2 peatlands are considered 'nationally important carbon-rich soils, deep peat and priority peatland habitat'.

9.2.5 Hydrogeology

The hydrogeology of the Site mostly comprises the bedrock aquifer of the Shinnel Formation and Glenlee Formation (undifferentiated) to the south, and partly underlain by bedrock aquifer of the Portpatrick Formation and Glenwhargen Formation (undifferentiated) to the north. These bedrock aquifers are characterised as low productivity comprising 'highly indurated rocks with limited groundwater in near surface weathered zone.'

The Site is partly underlain at the northern site boundary by bedrock aquifer of Crawford Group and Moffat Shale Group (undifferentiated). It is also characterised as low productivity with 'very limited groundwater from fractures'.

9.2.6 Flooding

SEPA flood mapping confirms river flooding extents within the Site are located along the River Cree tributaries in the south-west and north-west (Washing Burn and Cordorcan Burn). Flooding is characterised as having a high likelihood, meaning there is a 10 % chance of flooding each year for these areas. There is high likelihood of fluvial flooding to the immediate south-west of the Site, with an annual 10 % flood risk within the floodplain of the River Cree.

Flooding from surface water is present within the Proposed Development however it is not widespread. The risk of pluvial flooding varies between high and medium likelihood, this is either a 10% chance or 0.5% chance of flooding each year respectively.

There is no risk of flooding from coastal waters within the Site or surrounding area.

9.2.7 Private and Public Water Supplies

The Cordorcan Burn and its catchment which is located within the north-east of the Site, is designated as a Drinking Water Protected area (DWPA). The Proposed Development is also located within the Scotland groundwater Drinking Water Protection Zone.

There are several properties located close to the Proposed Development. Due to the remote and rural nature of the Proposed Development these properties may have a private water supply (PWS). Consultation with D&G Council will be undertaken as part of the EIA to identify any PWS within a 2 km radius of the Proposed Development.

9.2.8 Designated Sites

There are no designated areas of protection located within the Site boundary, including Geological Conservation Review (GCR) sites.

The Wood of Cree borders the land immediately downslope south-west of the Site, it is designated as a SSSI for freshwater habitats and woodland. The area is also an SAC designation, Galloway Oakwoods designated for the western acidic oak woodland. The SSSI includes areas of open water with lily beds and a flood plain with areas of mire, reedbed and willow carr. The three lochs within the site are examples of oligotrophic water lily pools with characteristic species of pondweed and stonewort. The SAC contains good examples of old sessile oak woods with a notable oceanic bryophyte flora, including some species rare in south-west Scotland.

Located 4.2 km downstream of the Site is the Lower River Cree SSSI, which is designated for Smelt fish.

Other designated sites within the 5 km study area that are considered to be upstream or hydrologically disconnected from the Site include Glentrool Oakwoods SSSI, Merrick Kells SSSI SAC, and Talnotry Mine SSSI.

9.3 Guidance and Legislation

The geology, hydrology and hydrogeology Chapter will be prepared with reference to best practice guidance and legislation, including (but not limited to):

9.3.1 Legislation

- EC Water Framework Directive (2000/60/EC).
- Water Environment and Water Services (Scotland) Act 2003.
- Water Environment (Controlled Activities) Regulations 2011.
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017.

9.3.2 Policy

- NPF4 (Scottish Government, 2023).
- Dumfries and Galloway Council Local Development Plan (2019).

9.3.3 Guidance

- Good Practice during Wind farm Construction, 4th Edition (Scottish Renewables, Scottish Natural Heritage (now NatureScot), Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science and AEECoW, 2019).
- Land Use Planning System – SEPA Guidance Note 31 (Guidance on Assessing Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems), Version 3, (SEPA, 2017).

- Control of Water Pollution from Linear Construction Projects – Technical Guidance, C648 (CIRIA, 2006).
- The SuDS Manual C753 (CIRIA, 2015).
- Environmental Good Practice on Site C741 (CIRIA, 2015).
- NetRegs, Guidance for Pollution Prevention (GPP – various).
- Developments on Peat and Off-site Uses of Waste Peat (Scottish Environment Protection Agency, 2017).
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, 2017).
- Developments on Peatland - Guidance on the assessment of peat volumes, re-use of excavated peat and the minimisation of waste (Scottish Renewables& SEPA, 2012).
- Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland (Forestry Commission Scotland & Scottish Natural Heritage, 2010).
- Managing Geotechnical Risk: Improving Productivity in UK Building and Construction (Institution of Civil Engineers, 2001).
- Ground Engineering Spoil: Good Management Practice CIRIA Report 179 (CIRIA, 1997).
- Scottish Roads Network Landslides Study Summary Report (Scottish Executive, 2005).
- Guidelines for the Risk Management of Peat Slips on the Construction of Low Volume/Low Cost Roads on Peat (Forestry Commission, 2006).

9.4 Study Area

The study area will include within the Site boundary and extending beyond this to a 2 km study area for consultation and assessment of PWS, and a 5 km study area for assessment of hydrological effects. The effects on geological receptors will be assessed within the Site boundary.

The impact assessment will consider potential cumulative effects, or in-combination effects associated with other developments in the same hydrological catchments and within 5 km of the Proposed Development.

9.5 Assessment Methodology

The potential effects from the Proposed Development on ground conditions and the water environment will be assessed by completing a desk study and field investigation followed by an impact assessment, the processes of which are detailed below.

9.5.1 Desk Study

An initial desk study will be undertaken to determine and confirm the baseline characteristics by reviewing available information relating to soils and peat, geology, hydrology, and hydrogeology such as groundwater resources, licensed and unlicensed groundwater and surface water abstractions, public and private water

supplies, surface water flows, flooding, rainfall data, water quality and soil data. This will include review of published geological maps, Ordnance Survey maps, aerial photographs, and site-specific data such as site investigation data, geological and hydrogeological reports, digital terrain models (slope plans) and geological literature.

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

9.5.2 Field Surveys

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

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

- verify the information collected during the desk and baseline study;
- undertake a visual assessment of the main surface waters and identify PWS;
- identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;
- visit any identified potential GWDTEs (in consultation with the project ecologists);
- visit PWS and DWPA sources that might be affected by the Proposed Development to confirm details of the location of the abstraction, its type and use, as required;
- prepare a schedule of potential watercourse crossings;
- assess Site geomorphology and conduct peat depth probing as required; and
- inspect rock exposures, establish by probing an estimate overburden thicknesses (a probe is pushed vertically into the ground to refusal and the depth is recorded).

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

Once the desk study is completed and sensitive soil and peat, geological and water features are confirmed an impact assessment will be undertaken to assess the potential effects on soils and peat, geology, and the water environment as a result of the construction and operation of the Proposed Development.

9.5.3 Assessment of Effects

The purpose of this assessment will be to:

- identify any areas susceptible to peat slide, using peat thickness and DTM data to analyse slopes;
- assist in the micrositing of turbines and tracks in areas of no peat or shallow and least geologically and hydrologically sensitive areas by applying buffer zones around watercourses and other hydrological features;
- assess potential effects on soils, peat and geology;

- determine what the likely effects of the Proposed Development are on the hydrological regime, including water quality, flow, and drainage;
- allow an assessment of potential effects on identified licensed and private water supplies;
- assess potential effects on water (including groundwater) dependent habitats;
- determine suitable mitigation measures to prevent significant hydrological and hydrogeological effects; and
- develop an acceptable code for working on Site that will adopt best practice procedures, effective management, and control of on-site activities to reduce or offset any detrimental effects on the geological, hydrogeological and hydrological environment.

It is anticipated that the impact assessment might include the following technical appendices:

- Peat Landside Hazard and Risk Assessment;
- Peat Management Plan;
- Watercourse Crossings Schedule;
- Private Water Supply Risk Assessment; and
- Groundwater Dependent Terrestrial Ecosystems Risk Assessment.

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

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

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

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

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

9.5.4 Peat Landslide Hazard and Risk Assessment

Phase I peat depth survey consisting of a 100 m grid across the entire site will be completed to indicate the peat depth and coverage on Site. This will inform the emerging site design and impact assessment as required by current best practice. As part of the programme of field work the following will be undertaken:

- a geomorphological mapping exercise to link the topographic features with the underlying geology and to visit those areas of Site that may be identified as potentially 'at risk from peat slide';
- the thickness of the peat will be established by probing and the underlying sub-strata confirmed by inspections of watercourses; and
- signs of existing or potential peat instability will be recorded.

Dependent on Phase I survey findings, a Phase II peat depth survey may be required to be undertaken as part of Site design in accordance with best practice and will include peat probing along the infrastructure at 50 m centres and at 10 m interval crosshair at turbine locations.

Output from the field surveys will comprise a record of investigation locations and summary of peat depths recorded.

Phase I and II peat depth results will be combined to produce a preliminary Peat Landslide Hazard and Risk Assessment (PLHRA) using Site survey data and slope analysis (using DTM data), highlighting areas that may be impacted by a peat slide so that appropriate mitigation measures can be identified and included in the Site design.

9.5.5 Peat Management Plan

Should the design be unable to avoid areas of peat a site-specific Stage 1 (outline) Peat Management Plan (PMP) will be prepared to assess the potential volume of peat excavation required and identify opportunities for re-use.

9.5.6 Borrow Pit Assessment

A review of suitability of materials on Site will be undertaken and borrow pit search areas will be identified as part of the Borrow Pit Assessment. If appropriate areas are identified a description of likely materials, borrow pit size and the ability to supply appropriate materials for the construction of the Proposed Development will be included.

9.6 Proposed Mitigation

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

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

- a buffer of up to 50 m will be applied to watercourses;
- site specific peat probing will be used to identify areas of potential deep peat and these will be avoided where practical;
- a site-specific PLHRA will be prepared and areas of potential increased peat slide risk will be avoided;
- if required, a Peat Management Plan (PMP) will be prepared to show how the integrity of peat will be safeguarded; and
- impacts on PWS sources and areas of GWDTE will be avoided.

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

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

9.7 Potential Effects

Without mitigation or adherence to best practice, effects on soils and peat, geology, hydrology, and hydrogeology could occur during the two main stages of development (construction and operation). A summary of the potential effects on ground conditions and the water environment resulting from construction, and operation of a wind farm is provided below. These will be considered in the EIAR.

Potential Effects During Construction:

- disturbance and loss of peat deposits;
- ground instability (inc. peat slide risk);
- effects on surface water and groundwater quality from pollution from fuel, oil, concrete or other hazardous substances;
- discharge of sediment-laden runoff to drainage system and watercourses;
- increased flood risk to areas downstream of the Site during construction through increased surface run-off;
- changes in groundwater levels from dewatering excavations;
- potential change of groundwater flow paths and contribution to areas of peat and GWDTEs;
- disturbance of watercourse bed and banks from the construction of culverts;
- potential pollution impacts to public and private water supplies; and
- disturbance and or pollution resulting from borrow pit formation and use.

Potential Effects During Operation

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

9.8 Receptors and Impacts Scoped In or out of Assessment

It is proposed that the potential effects outlined above will be assessed as part of the EIAR.

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

- It is proposed to scope out effects on geology (other than peat). While there will be effects arising from rock extraction for borrow pits, and for turbine and crane pad areas, these are limited in area and do not extend beyond the immediate development footprint. No particularly sensitive geological features have been identified within the Study Area.
- Monitoring including water quality, groundwater and surface water monitoring points or leachability trials will be scoped out, as published data can be used to characterise baseline conditions. Classification data is available from SEPA for the watercourses at site and there are no known sources of potential water pollution at site that might give rise for the need for water quality monitoring to be included within the EIAR.
- Detailed Flood Risk Assessment. It is assumed that potential flood risk can be suitably mitigated by including a 50m buffer from watercourses within the site layout design. Crossings of watercourses/ field drains, if required, will be designed to appropriately convey flows. Proposed watercourse crossings would be addressed within the schedule of watercourse crossings Appendix.

9.9 Scoping Questions to Consultees

- Do the consultees agree that the impacts described in Section 9.8 can be scoped out?
- It is not proposed to prepare a detailed drainage design. Rather measures that would be used to control the rate and quality of runoff will be specified in the EIAR. Do consultees agree this is acceptable?
- Do consultees agree that a detailed Flood Risk Assessment can be scoped out of the assessment at this stage?

- Site investigations, including detailed peat probing and private water survey, will be undertaken as part of the proposed assessment. Should any additional investigation be considered when assessing baseline conditions?
- Please advise if there is any specific information or methodology that should be used / followed as part of the PWS risk assessment.
- Do consultees agree that the scope of the proposed assessment, including proposed field surveys, assessment methodology and study areas, is appropriate?

9.10 Figures

- Figure 9.1 – Hydrological Features
- Figure 9.2 – Superficial Geology
- Figure 9.3 – Bedrock Geology
- Figure 9.4 – Peat Classifications

10 Transport and Access

10.1 Introduction

This Chapter outlines the proposed approach for the assessment of potential significant environmental effects associated with transport and access impacts during the construction of the Proposed Development. An assessment of potential effects during the operation and decommissioning of the Proposed Development has been scoped out as the impacts during these stages are **negligible** and / or subject to a separate assessment process.

The final Transport and Access Chapter will:

- Provide a description of the baseline conditions for which the assessment will be based;
- Assess changes to traffic flows as a result of Proposed Development construction traffic including consideration of any cumulative development traffic flows;
- Determine the significance of the effect of changes to the transport network caused by construction and cumulative impacts; and
- Describe suitable mitigation measures to address any significant effects.

The Transport and Access Chapter will be supported by an Abnormal Loads Routes Assessment (ALRA) Report, which will be provided as an Appendix.

10.2 Baseline Description

The proposed study area (**Figure 10.1**) includes the transport network which will be used to access the Proposed Development by construction vehicles and staff. Sensitive receptors for example, but not limited to, private homes, bus passengers, schools, public rights of way and active travel routes along or immediately adjacent to this transport network are included in the study area.

From the proposed Port of Entry for Abnormal and Indivisible Load deliveries at King George V Docks in Glasgow, the study area predominantly covers the M8, M74 / A74 and M6 motorways. These are all national speed limit roads with 3 lanes provided in each direction for the entirety of the route.

The study area also covers the A75 Trunk Road (T) from Gretna to Stranraer. The A75 (T) is predominantly a single carriageway route operating at national speed limit. National Cycle Route (NCN) 7 crosses the A75 (T) to the north of Girthon and then once more at the A75 (T) junction with the A712. NCN73 then crosses the A75 (T) at Newton Stewart and again at Glenluce, before running parallel with A75(T) close to Stranraer.

The A75(T) passes through a number of small settlements, although bypasses larger towns including Dumfries, Gretna and Annan. Footway provision is provided on the A75(T) as it passes through settlements and the A75(T) is also a bus route serving Stagecoach 500, 501, 521 and 555 bus routes.

The Breedon Boreland, Barlockhart and Tongland Quarries are all located off of the A75 (T) to the east (Boreland and Barlockhart) and west (Tongland) of Newton Stewart. These would be looked to be used for concrete and aggregate supplies for the construction of the Proposed Development.

Finally, the study area includes the A712 before joining a privately owned forestry track leading to Site.

The A712 is a local single carriageway road which operates at national speed limit in proximity to Site. There are no pedestrian facilities provided on the A712 and cyclists are expected to cycle on the carriageway. The A712 is also signposted as a local cycle route. There are a very limited number of properties located off of the A712 in proximity to Site.

10.2.1 Data Collection

To establish a baseline for assessing the impact of the Proposed Development, traffic data collection will be required. Publicly available Annual Average Daily Flow (AADF) data is available via www.dft.gov.uk for some road links within the study area as set out in **Table 10.1** below and shown in **Figure 10.2**. It is proposed that this publicly available data is supplemented via the commissioning of bespoke traffic surveys. These surveys will take the form of Automatic Traffic Counts (ATC) over the course of one week in September 2023. From this data an estimated Annual Average Daily Traffic (AADT) will be calculated. The traffic flows associated with any committed developments will also be included within the AADT.

Table 10.1 Publicly available DfT Count Points on the A75 (T) (ordered east to west between M74(A) and Newton Stewart

DfT Count Point ID	Start Junction	End Junction	Latest Available Year Data	Count Method
80199	B6357	A74(M)	2021	Estimated using previous year's AADF
80285	B721	B6357	2021	Automatic counter
80286	B7020	B721	2021	Automatic counter
50746	B724	B7020	2021	Automatic counter
80287	A780	B724	2021	Automatic counter
80288	A709	A780	2021	Automatic counter
80289	A701	A709	2021	Automatic counter
80290	A76	A701	2021	Manual count
80291	A780	A76	2021	Automatic counter
10740	A712	A780	2021	Automatic counter
80377	A745	A712	2021	Automatic counter
92153	BNG 275658, 563022	BNG 277302, 564301	2021	Automatic counter
92154	BNG 271420, 558932	BNG 275658, 563022	2021	Automatic counter
80294	A711	B736	2019	Automatic counter
740	A762	A711	2021	Automatic counter

DfT Count Point ID	Start Junction	End Junction	Latest Available Year Data	Count Method
30747	A762	A762	2021	Estimated using previous year's AADF
80295	A755	A762	2021	Estimated using previous year's AADF
80296	B796	A755	2021	Estimated using previous year's AADF
80297	C-road Barholm	B796	2021	Estimated using previous year's AADF
80338	A712	C-road Barholm	2021	Estimated using previous year's AADF
40836	A714	A712	2021	Automatic counter
10744	B733	A714	2021	Automatic counter

Publicly available data is comprehensive on the A75 (T) however no publicly available data exists for the A712 in proximity to Site. For this reason, we propose that ATC traffic data be collected on the A712 at the location shown in **Figure 10.2**.

10.3 Legislation, Policy and Guidance

The following legislation, policy and guidance will be considered:

10.3.1 National Planning Framework 4 (NPF4)

The below extracts from Policy 11 NPF4 are deemed to be particularly to the assessment of Transport and Access implications of the Proposed Development:

a) Development proposals for wind farms including repowering, extending, expanding and extending the life of existing wind farms;

e) In addition, project design and mitigation will demonstrate how the following impacts are addressed:

i. impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker;

iii. public access, including impact on long distance walking and cycling routes and scenic routes;

vi. impacts on road traffic and on adjacent trunk roads, including during construction; and

xiii. cumulative impacts.

10.3.2 Dumfries and Galloway Local Development Plan

The D&G Local Development Plan (LDP) was adopted in October 2019. This sets out the spatial framework for D&G for the plan's period including for wind energy development.

Policy IN2: Wind Energy states "The Council will support wind energy proposals that are located, sited and designed appropriately." The acceptability of any proposed wind energy project will be assessed against:

- Cumulative Impact;
- Impact on Local Communities and Residential Interests;
- Impact on Infrastructure; and
- Other Impacts and Considerations.

In relation to Transport and Access these considerations will form part of the assessment approach.

10.4 Assessment Methodology

The purpose of the assessment is to establish the likely number of construction traffic movements across the construction programme, the capacity of the local road network to accommodate this increase and the significance of the effect this would have on road links and sensitive receptors within the study area.

The assessment will be completed following best practice EIA guidelines including:

- Institute of Environmental Assessment (IEA) (January 1993). The Guidelines for the Environmental Assessment of Road Traffic;
- Institution of Environmental Management and Assessment (IEMA) (July 2023) 'Environmental Assessment of Traffic and Movement;
- Institution of Environmental Management and Assessment (IEMA) (2005) Guidelines for Environmental Impact Assessment;
- Highways England (various dates). Design Manual for Roads and Bridges: Volume 11 – Environmental Assessment (LA101 to LA104); and
- Transport Scotland (2012) Transport Assessment Guidance.

Updated assessment guidelines entitled 'Environmental Assessment of Traffic and Movement' were published in July 2023 by IEMA which replace The Guidelines for the Environmental Assessment of Road Traffic (1993). A copy of this newly published guidance document has been requested by Meinhardt. The assessment methodology presented below adheres to the previous guidance (1993), however, the final EIAR including the assessment methodology will be modified where necessary to comply with the updated assessment guidelines.

In accordance with IEA Guidelines detailed assessment will be undertaken where traffic flows are predicted to increase by 30 % or more (or 10 % or more in areas identified as sensitive) or where Heavy Goods traffic is predicted to increase by 30 % or more. If the predicted growth falls below these thresholds, no detailed

assessment would be undertaken, and the effects would be taken as **negligible** and thus assessment of effects is not warranted.

Within the study area, the sensitivity of the following receptors would be considered:

- Pedestrians;
- Cyclists;
- Bus passengers;
- Local residents;
- Local businesses;
- Sensitive locations such as hospitals and schools; and
- Conservation sites.

These would be assessed in regard to the following effects:

- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian amenity;
- Fear and intimidation; and
- Accidents and safety.

The significance of the effects listed above on receptors would be established through consideration of the number of receptors, their sensitivity and the length of time that they would be impacted. These would be considered subjectively but in line with IEA and DMRB guidance. Aspects such as noise and vibration which are affected by traffic movements are covered in Chapter **Error! Reference source not found.**.

The next stage of the assessment would be to establish the magnitude of the environmental impact and level of significance these impacts would have. This requires the definition of both baseline conditions and estimation of conditions for the appropriate period of assessment, in this case the year(s) of construction. Each receptor would have a different value and level of sensitivity to change.

As per IEA guidelines thresholds for traffic flow increases of 10% and 30% are considered. Changes in traffic levels of 30%, 60% and 90% should be considered as **"slight**, **moderate** and **substantial"** impacts respectively. Traffic flow increases of less than 10% are generally considered to be '**negligible**', given that daily variation in background traffic flow may vary by this amount. Based on these rules and perceptions, it is proposed to classify the magnitude of the impact as follows:

- **major** - >90 % increase in traffic
- **moderate** – 60-90 % increase in traffic
- **minor** - 30-60 % increase in traffic
- **negligible** – 0-30 % increase in traffic

The receptor sensitivity and magnitude of effect are then combined to identify the significance of the effect overall in line with IEMA and DMRB Guidance.

10.5 Potential Mitigation

A Construction Traffic Management Plan (CTMP) including a construction staff travel plan forms the most effective mitigation measure and a Framework for this Plan will be included as part of the assessment.

10.6 Potential Effects

During the construction phase of the Proposed Development, it is anticipated that there will be short-term increases in traffic as a result of transporting construction materials, equipment and staff. However, it is important to note that these impacts will be temporary. With the introduction of a CTMP, no significant effects are anticipated, however this will be fully assessed.

10.7 Questions for Consultees

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

10.8 Figures

- Figure 10.1 – Construction Traffic Routes (Abnormal Load Route)
- Figure 10.2 – Construction Traffic Routes and Traffic Survey Locations

11 Acoustics

11.1 Introduction

This Chapter sets out the proposed approach to the assessment of potential effects resulting from the construction and operation of the Proposed Development in relation to sound immissions.

11.2 Baseline description

The acoustic environment around the Site is expected to be typical of a rural area and consist of sounds generated by wind, farm machinery, birds, distant traffic and occasional overflying aircraft.

It is proposed to undertake background sound measurements at representative properties close to Site. The survey locations will be selected in consultation with the environmental health department of D&G Council and are subject to permission being granted by the residents to access relevant amenity areas outside dwellings.

11.3 Legislation, Policy and Guidance

Operational acoustic impact will be assessed in accordance with ETSU-R-97, and the Good Practice Guide to its application issued by the Institute of Acoustics. This is consistent with 'Planning Advice Note 1/2011: Planning and Noise' and the further guidance provided in the web-based planning advice on renewable technologies for onshore wind turbines.

Although ETSU-R-97 makes reference to a background and operational noise, there is a distinction between sound and noise. This document differentiates between sound and noise and therefore the use of 'background sound' as well as 'operational sound' is more appropriate.

Operational sound immissions from the associated battery energy storage system will be assessed in line with BS 4142:2014+A1:2019 'Methods for assessing and rating industrial and commercial sound'.

Construction sound immissions will be discussed with reference to the reference to the procedures within BS 5228-1:2009+A1:2014. This is consistent with the web-based Scottish Government technical advice on construction sound assessment in 'Appendix 1: Legislative Background, Technical Standards and Codes of Practice'.

If blasting is required at potential borrow pits located at the Proposed Development, the expected sound and vibration levels will be discussed with reference to BS 5228-2:2009+A1:2014, BS 6472-2:2008 and 'best practicable means' in this regard.

11.4 Study Area

The study area will be determined by the proximity of nearby properties to the Proposed Development and the location of any neighbouring wind farms being considered as part of the cumulative assessment.

The acoustic assessment will include the nearest properties to the Proposed Development. Any properties that are in planning or consented will be considered alongside those already existing.

The cumulative assessment will consider any neighbouring wind farms that are close enough to result in the potential for a significant cumulative effect on the identified properties. Any wind farms that are in planning will be considered along with those that are already operational or consented.

11.5 Assessment Methodology

The assessment will consider the potential effects associated with construction and operation of the Proposed Development as detailed below.

A discussion of the potential effects due to construction sound, including sound associated with vehicle movements, at the nearest properties will be provided. Sound and vibration levels at the nearest properties will also be discussed if blasting is required to extract material from any proposed borrow pits.

An assessment of potential effects of sound due to operation of the Proposed Development at the nearest properties will be undertaken. The operational acoustic assessment will be carried out on the basis of the sound pressure levels with penalties applied for tonality, if applicable.

It is not proposed to carry out an assessment of the potential effects of sound from operation of the Proposed Development at specific frequencies, e.g., low frequency sound, or the potential effects of other sound and vibration characteristics due to operation, such as amplitude modulation and vibration. However, a generalised discussion of these topics, in relation to current guidance and research, with reference to the Proposed Development will be provided.

An assessment of potential effects of sound due to the operation of the energy storage system associated with the Proposed Development will be undertaken at the nearest properties. The operational sound assessment will be carried out on the basis of the broadband sound pressure levels with any relevant penalties applied for certain acoustic features, as per BS 4142:2014+A1:2019.

11.6 Potential Mitigation

Standard good practice measures to reduce acoustic impact during construction will be implemented in line with the ‘best practicable means’ defined by the Control of Pollution Act 1974 (her Majesty’s Stationary Office, 1974). If additional mitigation measures are required, this will include a reduction in construction activities or traffic during certain periods, where considered appropriate.

The potential effects of sound due to operation of the Proposed Development will be considered in the design process via the application of nominal buffers to neighbouring residences within which turbines will not be placed.

The baseline sound monitoring results will also inform the design of the Site, with greater separation distances potentially being required for residences with relatively low background sound levels and corresponding derived acoustic limits.

The turbines which comprise the Proposed Development will be operated in reduced sound modes if this is necessary to meet the acoustic limits derived in accordance with ETSU-R-97.

The potential operational acoustic impacts from the energy storage system associated with the Proposed Development will be considered in the design process by incorporating appropriate buffers between the storage system compound and neighbouring residences. Additional mitigation such as sound barriers will be proposed if deemed necessary to meet the required acoustic limits in accordance with BS 4142:2014+A1:2019.

11.7 Potential Effects

The potential effects of sound and vibration on residential amenity at nearby properties due to the construction and operation of the Proposed Development will be assessed. Where necessary, appropriate mitigation measures will be proposed, and any residual impacts identified.

11.8 Matters Scoped In or Out of Assessment

Potential impacts relating to the construction and operation of the Proposed Development will be discussed and assessed as part of the EIAR supporting the planning application.

The nearest planned, consented or existing properties are scoped into the assessment.

Specific assessments of low frequency sound, amplitude modulation or vibration due to operation of the Proposed Development are scoped out of the assessment. However, a discussion of relevant guidance and research regarding these topics will be provided as supporting information.

11.9 Questions for Consultees

- Do the consultees agree with the proposed assessment methodology?

12 Aviation and Radar

12.1 Introduction

The Applicant has completed an initial appraisal of the potential interactions with aviation and radar signals surrounding the Site. This appraisal indicates that there is potential for an impact on the NATS En Route Limited (NERL) radar at Lowther Hill. An aviation lighting scheme will also be required.

12.2 Baseline Description

The initial indication of any potential impacts on radar and aviation is to assess the radar line of sight visibility. This provides a baseline from which to disregard or investigate further any impacts. An internal assessment identified NERL as the main stakeholder with whom further consultation will be necessary. This will be verified once the scoping responses are received.

The Civil Aviation Authority (CAA) and Ministry of Defence (MoD) will be consulted to agree a suitable aviation lighting scheme.

12.3 Legislation, Policy and Guidance

The main guidance documents for wind farm development with potential impact on radars and aviation is *CAP 764, CAA Policy and Guidelines on Wind Turbines*.

The legislation that dictates lighting of en-route obstacles, such as wind turbines, above 150 metres is the *Air Navigation Order (ANO) 2016 (as amended), Article 222*.

12.4 Assessment Methodology

Consultation will be undertaken with the following consultees to establish if the Proposed Development will have an effect on their interests:

- MOD via the Defence Infrastructure Organisation (DIO);
- NERL; and
- CAA.

The responses of these organisations will guide the scope of the assessment. It is not possible to accurately determine the scope of the assessment at this stage, as it is necessary to understand how the Proposed Development interacts with the specific operational procedures and regulations of all of the specific consultees.

12.5 Potential Mitigation

There are a number of mitigation options available to alleviate problems caused by wind turbines to aviation and aviation radar. The mitigation solutions range from removal of turbines in problematic areas, to complex technical hardware solutions. NERL has several mitigation options to mitigate the impacts of wind turbines on the Lowther Hill radar and will usually advise the most appropriate solution.

To mitigate the effects of aviation lighting on visual amenity, a reduced lighting scheme will be proposed to the CAA and, if required, an aviation lighting detection system will be considered. Should any further mitigation technologies become available that could further reduce the potential impacts of aviation lighting, these would be considered and assessed for their suitability for the Proposed Development.

Mitigation solutions are highly specific to the impact in question. Consultation with relevant consultees is key to establishing the appropriate method of mitigation, if required.

12.6 Potential Effects

It is not anticipated that the construction phase of the Proposed Development will have any significant effects on aviation or radar receptors. However, the MOD Defence Geographic Centre will be informed of turbine erection dates, turbine locations and tallest crane heights prior to construction so that aviation charts can be updated accordingly to warn aviators of the presence of the Proposed Development construction activities.

There is potential that the turbines at Blair Hill could create issues to aviation during the operational phase of the project. The two primary effects are:

- Creating a physical obstruction to air traffic; and
- Interference with aviation radar operations.

NERL may require a radar mitigation solution, although studies to date only indicated that eight of the turbines are visible to the radar.

The UK Air Navigation Order (ANO) 2016, Article 222, sets out the statutory requirement for the lighting of en-route obstacles, which applies to structures 150 metres or more above ground level. As the proposed turbines are above 150 metres, visible aviation lighting will be required. The implications of this for visual amenity will be considered in the EIAR as detailed in Chapter 5 of this EIA Scoping Report.

In addition, the MOD is likely to request an infra-red lighting scheme for low flying military aircraft in the area. This will be agreed through consultation with the MOD.

13 Socio Economics

13.1 Introduction

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

Nevertheless, it is recognised that socio-economic and tourism issues will be of interest to stakeholders and local authorities and so a separate report on socio-economics and tourism will be provided and submitted alongside the EIA. This section describes what will be considered in the separate socio-economic and tourism report and the approach that will be taken.

13.2 Baseline Description

The baseline assessment will include a description of the current socio-economic, recreation and tourism baseline within the local area. This will include a summary of the economic performance data and a description of the relevant tourism assets that will be covered in the assessment.

The baseline description will cover and compare the study areas of:

- Dumfries and Galloway; and
- Scotland.

The population of D&G was 148,800 in 2021 (2.7% of the Scottish total), of which 58 % were working age, lower than the figure for Scotland of 64 %. Between 2018 and 2043, the population is projected to decrease by 8.4 %, compared to a 2.5 % increase for Scotland as a whole.

The proportion of the population that is economically active is significantly lower in D&G (72.0 %), compared to Scotland as a whole (77.2 %), while the unemployment rate is 4.8 % compared to 3.5 % nationally.

The main sectors of employment are human, health and social work activities (16 % of employment in D&G compared to 15 % in Scotland), wholesale and retail trade (16 % compared to 14 % nationally) and agriculture, forestry and fishing (13 % compared to 3 % nationally). The share of employment in construction in D&G is 5 %, lower than the Scottish average (6 %).

In Mid Galloway and Wigtown West, around 10 % of employment is in the sustainable tourism sector, which is higher than the proportion in D&G (9 %) and Scotland as a whole (8 %). This indicates the importance of tourism in the area surrounding the Proposed Development.

In 2019, there were 5.3 million day visitors in D&G (compared to 145 million in Scotland as a whole) and 699,000 domestic overnight visitors (compare to 12.4 million nationally). Domestic visitor spend was £374 million, 5 % of the £8.2 billion in Scotland as a whole.

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

- the population characteristics of the local area, including local and national demographic trends;
- deprivation statistics set within a national context;
- employment and economic activity in the local area within the context of the national economy;
- wage levels in the local area compared to the national level;
- the industrial structure of the local economy compared to the national level; and
- the role of the tourism sector in the local economy.

13.3 Legislation, Policy and Guidance

There is no specific legislation or guidance on the methods that should be used to assess the socio-economic impacts of a proposed onshore wind farm development. The proposed method has however been based on established best practice, including that used in the UK Government and industry reports on the sector. In particular, this assessment will draw from two studies by BiGGAR Economics on the UK onshore wind energy sector: a report published by RenewableUK and the Department for Energy and Climate Change (DECC) in 2012 on the direct and wider economic benefits of the onshore wind sector to the UK economy and a subsequent update to this report published by RenewableUK in 2015.

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

For recreational assets, guidance has been provided by NatureScot (NS) on how to assess effects on recreational amenity and the approach outlined has been used. This takes into consideration a number of potential effects, including direct effect on facilities, such as limitation or restrictions on access, and effects on the intrinsic quality of the resources enjoyed by people. In general, this guidance would consider recreational and access impacts to potentially be significant if:

- permanent or long-term effects on the resources on which enjoyment of the natural heritage depends, in particular where facilities have been provided by SNH or others under statutory powers;
- permanent or long-term change that would affect the integrity and long-term sustainable management of facilities which were provided by SNH or others under statutory powers;
- where there are recreational resources for open air recreation pursuits affected by the proposal which have more than local use or importance, especially if that importance is national in significance;

- major constraints on or improvements for access or accessibility to designated natural heritage sites; and
- where mitigation and/or compensatory or alternative recreational provision is considered to be inadequate.

It is also important that the socio-economic and tourism assessment takes account of the relevant local and national policy objectives. The most relevant objectives for this are expected to be included in the following strategies:

- Scottish Government (2022), Scotland's National Strategy for Economic Transformation;
- Scottish Government (2023), Scotland's National Performance Framework;
- Scottish Government (2021), Local Energy Policy Statement;
- Scottish Government (2022), Onshore Wind Policy Statement;
- South of Scotland Regional Economics Partnership (2021), South of Scotland Regional Economic Strategy;
- The Borderlands Partnership (2021), Borderlands Inclusive Growth Deal; and
- Scottish Tourism Alliance (2021), Scotland Outlook 2030.

It is also essential to take into consideration for the assessment the fourth National Planning Framework (NPF4), the national spatial strategy for Scotland. The document considers:

- Scotland's spatial principles;
- National planning policy;
- National developments; and
- Regional priorities.

In the context of energy generation, Policy 11 is relevant to the socio-economic impact of the Proposed Development. Paragraph (c) states that "*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*". The analysis will reach the conclusion on whether the project maximises the net economic impact in the context of this NPF4 Policy 11(c).

Paragraph (d) of Policy 11 sets out a number of impacts that should be addressed during project design and mitigation. That list does not include tourism.

Whilst NPF4 includes no requirement to consider tourism when considering net economic impact or in the project design and mitigation process, relevant employment statistics show that in Mid Galloway and Wigtown West the employment in the sustainable tourism sector accounts for a higher percentage of total employment in the area (10%) compared to Scotland (8%). This indicate the importance of tourism in the local area surrounding the Proposed Development and it is recognised that local stakeholders may be interested in the potential impact. Thus, a tourism assessment will be included in the socio-economic report.

13.4 Assessment Methodology

It is anticipated that the contents of the assessment will include:

- introduction;
- economic development and tourism strategic context;
- baseline socio-economic context;
- baseline tourism and recreation context;
- socio-economic assessment;
- tourism and recreation impact assessment;
- proposed measures and actions to maximise local economic and community impacts; and
- summary of findings and conclusion.

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

The assessment of socio-economic impacts will focus on the level of activity/employment supported during the construction and operation phases. Government and industry reports will be used to determine the expected capital and operational expenditure associated with the Proposed Development, as well as the breakdown of expenditure by different contracts (e.g. turbine, balance of plant). An assumption will then be made based on the share of each type of contract that can be secured regionally and nationally. This increase in turnover will then be used to estimate the economic impact associated with the Proposed Development.

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

If an effects assessment is required, this will be based on assessing the sensitivity of an economy/tourism and recreation asset to change and then assessing the potential magnitude of change associated with the Proposed Development. When sensitivity and magnitude are combined, the significance of effect will be assessed. **major** and **moderate** effects will be considered significant in the context of the EIA Regulations.

13.5 Potential Mitigation

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

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

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

13.6 Potential Effects

The effects that will be considered in this assessment will include the potential socio-economic, tourism and recreation effects associated with the Proposed Development.

An economic impact analysis will be undertaken using the methodology developed by BiGGAR Economics; which has been used to assess over 150 onshore wind farms across the UK. The potential socio-economic effects that will be considered are:

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

The link between onshore wind energy developments and the tourism sector has been a subject of debate. However, the most recent research has not found a link between tourism employment, visitor numbers and onshore wind development.

In 2021, this study was updated, and research identified 16 wind farms with a capacity of at least 10 megawatts that became operational between 2015 and 2019. Analysis of trends in tourism employment in the locality of these wind farms (15 km radius) found that 11 of the 16 areas had experienced more growth in tourism employment than for Scotland as a whole. For 13 of the 16 wind farms, trends in tourism employment in the locality had outperformed the local authority in which they were based. This work reflected an update of previous work undertaken by BiGGAR Economics in 2017 that considered 28 wind farms constructed between 2009 and 2015 and the trends in tourism employment in the areas local to these developments. The analysis found that there was no relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at the local authority level nor in the areas immediately surrounding wind farm developments.

Nevertheless, the tourism sector is an important contributor to the Scottish economy, and particularly in the local area surrounding the Proposed Development (Mid Galloway and Wigtown West electoral ward) where the sustainable tourism sector accounts for 10 % of the total employment, higher than the relative proportion in D&G (9 %) and Scotland (8 %). Additionally, the development is in the Galloway and Southern Ayrshire UNESCO Biosphere which is considered a major bio-geographic area that has recently been expanded attracting people with an interest in the protection of species, habitats, landscapes and ecosystems.

Therefore, there is merit in considering whether the Proposed Development will have any effect on tourism behaviour and the tourism economy. This assessment will consider the potential effects that the development

could have on tourism following a more focused approach on effects related to the UNESCO Biosphere and key tourist attractions and recreation assets.

13.7 Matters Scoped out of EIA Assessment

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

13.8 Questions for Consultees

- Do you agree that the scope of the proposed assessment is appropriate?
- Are there specific socio-economic, tourism and recreation effects that should be considered?

14 Forestry

14.1 Introduction

The Forestry Chapter will provide an assessment of the impacts of the construction and operation of the Proposed Development on the commercial forestry crops and other woodland areas present on the Site.

The purpose of the assessment will be to:

- Confirm the present age and species structure of the tree crops.
- Analyse the impact of any necessary tree removal to facilitate the Proposed Development.
- Identify any measures necessary to mitigate the impact of the development on the existing tree crops.

14.2 Baseline Description

The Site is located within an extensive area of forestry, located approximately 2.7 km north of Newton Stewart. The main areas of woodlands within the Proposed Development Site (excluding access route) extend to just over 400 hectares (Ha) comprising of three separate blocks dominated by commercial conifer plantings and associated areas of broadleaves, designed open ground, access roads and rides. The access route within the Proposed Development Site also passes though commercial forestry crops.

The forestry baseline will describe the crops existing at the time of preparation of the EIA including information on species, planting year and both felling and restocking design proposals.

14.3 Legislation, Policy and Guidance

The forestry proposals will be prepared in accordance with the current industry best practice and guidance including, but not limited to:

- Forestry Commission Scotland (2009): The Scottish Government's Policy on Control of Woodland Removal. Forestry Commission, Edinburgh.
- SEPA (2014): Use of Trees Cleared to Facilitate Development on Afforested Land. Land Use Planning System SEPA Guidance Note LUPS-GUS2.
- UKWAS (2018): The UK Woodland Assurance Standard Fourth Edition. UKWAS, Edinburgh.
- Forestry Commission (2017): The UK Forestry Standard, The Government's Approach to Sustainable Forestry. Forestry Commission, Edinburgh.
- The Scottish Government (2019): Scotland's Forestry Strategy. The Scottish Government, Edinburgh.
- Forestry Commission (2019): Managing forest operations to protect the water environment. Forestry Commission, Edinburgh.

14.4 Assessment Methodology

Existing forestry records will be analysed and augmented as required through further survey and assessment to document the full detail of the existing tree cover over the Site. Analysis will be presented documenting any requirement to remove tree crops to accommodate the infrastructure footprint of the Proposed Development.

14.5 Potential Effects

Areas of woodland will need to be felled for the construction and operation of the Proposed Development including areas for access tracks, turbine locations and other infrastructure. Further woodland may also need to be felled for wind yield and other technical reasons and the structure of the woodlands may therefore change, resulting in a potential loss of woodland area. This will be addressed through the redesign of the existing forest including, for example, replanting areas of existing open ground, replanting alternative woodland types or the provision of compensatory woodland planting on an alternative site.

14.6 Potential Mitigation

There is a presumption against permanent woodland removal within the UK unless it addresses other environmental concerns or delivers additional and clearly defined public benefits. The Scottish Government's "Control of Woodland Removal Policy" (2009) records the assessment requirements and compensatory measures which should be considered when removing woodland cover and the requirements under this policy will be addressed within the EIA.

14.7 Questions for Consultees

- Do consultees agree to the proposed methodology stated within section 14.4?

15 Carbon Balance

15.1 Introduction

This Chapter of the document sets out the proposed approach to the assessment of potential of the Proposed Development on carbon balance as a result of the construction and operation of the Proposed Development.

Calculation of the carbon footprint will be based on best practice guidelines including the Scottish Government Carbon Calculator Tool.

15.2 Baseline Description

The Proposed Development will consist of up to 22 turbines with a maximum tip height of 250 m, with a installed capacity of up to 145 MW (excluding capacity from the energy storage facility). The generation from the Proposed Development has the potential to displace electricity generated from fossil fuels during its operational lifespan and consequently prevent carbon dioxide (CO_2) from being released. The EIA will provide an estimate of the potential amount of CO_2 savings that can be made will be based on assessing the electricity generation mix that the Proposed Development is displacing at any given time and the carbon released due to the construction of the Proposed Development.

The Proposed Development is situated in within an area of commercial forestry and peatlands. Peat surveys will be undertaken to determine the extent of carbon rich soils.

15.3 Legislation, Policy and Guidance

The United Nations, UK Government, Scottish Government and D&G Council have set targets for tacking climate change.

15.3.1 Legislation

- UK Government, Climate Change Act (2008)
- Scottish Government, The Climate Change (Scotland) Act (2009).

15.3.2 Guidance

- Scottish Government, Calculating potential carbon losses and savings from wind farms on Scottish Peatlands, Technical Note Version 2.10.0 (2018).

15.4 Assessment Methodology

A wind farm constructed on peatland habitat and forestry has the potential to generate CO_2 emissions as a result of the excavation and/or degradation of peat and removal of forestry. The current best practice guidance available on the Scottish Government website provides a method to calculate carbon emission savings associated with wind farm developments on Scottish peatlands using a full life cycle analysis approach

using a web-based application. The tool was originally published in 2008 and the latest version was published in December 2018 (Scottish Government, 2018). The Scottish Government's Carbon Calculator Tool V1.7.0 or the latest version at the time of writing will be utilised to inform this Chapter.

The tool compares the carbon costs of wind farm developments with the carbon emissions savings attributable to the Proposed Development. The calculation is summarised as the length of the time (in years) it will take the carbon savings to amount to the carbon costs also referred as the 'payback period'. An assessment of effect of significance will not be undertaken but the volumes of CO_2 savings and emissions will be provided in the Chapter.

15.5 Potential Mitigation

The Proposed Development will reduce the CO_2 emissions being released by the electricity generation system.

The Proposed Development will be designed to minimise turbines being sited on areas of deep peat, reduce the excavation of peat and minimise removal of forestry as far as possible. Best practice measures will also be considered to minimise peat disturbance during construction. These will be provided as a part of the PMP if required.

Further mitigation at the construction phase will be considered within the CEMP.

15.6 Questions for Consultees

- Do consultees agree with the above methodology for assessing carbon emissions and savings as a result of the Proposed Development?

16 Shadow Flicker

16.1 Introduction

This section considers shadow flicker, which is a phenomenon that can occur when the blades of a wind turbine cover the sun for brief moments as they rotate. For an observer viewing this phenomenon through a narrow opening (such as a window from within the affected area) it can create a rapid change in luminance, appearing as if the light is being 'flicked' on and off each time a blade passes in front of the sun.

16.2 Assessment Methodology

Potential for shadow flicker impacts will be assessed at all residential receptors within the shadow flicker study area. The shadow flicker study area includes the area within a distance of 10 times the rotor diameter in accordance with published research.

The affected area is constrained in size and shape by astronomic and geometric parameters, such as the trajectory of the sun and the position and dimensions of the wind turbine. For a fixed observer, the occurrence of shadow flicker from a given wind turbine is generally limited to certain parts of the year and certain times of the affected days. It is possible to predict when, where and for how long shadow flicker could theoretically occur.

The Scottish Government sets out the potential affected area which may fall under assessment: "Where this (shadow flicker) could be a problem, Applicants should provide calculations to quantify effect. In most cases however, where separation is provided between wind turbines and nearby dwellings (as a general rule ten rotor diameters), 'shadow flicker' should not be a problem."

Residential receptors within the affected area, as described above, shall be identified and assessed for the potential to be affected by shadow flicker. The assessment will present clear findings on the estimated number of hours of shadow flicker impact anticipated for each receptor. Where required, potential mitigation measures will be discussed, including screening or, if necessary, shutting down of turbines causing the flicker.

No impacts are anticipated during construction or decommissioning.

16.3 Questions for consultees

- Do the consultees agree with the proposed assessment methodology?

17 Telecommunications

17.1 Introduction

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

17.2 Assessment Methodology

Wind turbines can cause interference of electromagnetic signals through physical and electrical interference. Physical interference can cut across electromagnetic signals resulting in a ghosting effect which largely affects television and radar. Electrical interference arises as a result of the operation of the generator within the nacelle of the turbine and can also affect communication equipment in proximity to the turbines. Where possible, any potential effects on electromagnetic signals will be mitigated during the turbine layout design by the use of exclusion zones around any electromagnetic links.

17.2.1 Television and Radio

Digital television signals are much better at coping with signal reflections than analogue television signals and do not suffer from ghosting (Ofcom, 2009). Given the strength of the digital signal in the area and the inherently resilient nature of digital television reception, there is considered to be a low risk of any interference from a wind energy development at this location on domestic television reception.

Broadcast radio (FM, AM and DAB digital radio) are transmitted on lower frequencies than those used by terrestrial television signals. Lower frequency signals tend to pass through obstructions more easily than the higher frequency signals, and diffraction effects also become more significant at lower frequencies. Both these factors will tend to lessen the impact of new structures on broadcast radio (Ofcom, 2009).

It is therefore proposed that an assessment of potential effects on television and radio is **scoped out** of the EIA.

17.2.2 Fixed Links

Ofcom is responsible for the licensing of two-way radio transmitters. It holds a register of most fixed links and will therefore be consulted in order to establish baseline conditions. However, because not all fixed links are published, system operators will also be individually consulted on the potential for the Proposed Development to cause electromagnetic interference. An assessment will be made as to the significance of potential operational effects and where appropriate, suitable mitigation measures will be discussed. The outcome of this assessment will be detailed in the EIAR.

17.3 Questions for consultees

- Do the consultees agree with the proposed assessment methodology?

18 Other Environmental Issues

18.1 Population and Human Health

The assessment of potential population and human health effects will be undertaken in the context of residential amenity (i.e. visual impact, noise and shadow flicker where Scoped In to the EIA).

It is therefore proposed that a specific assessment on potential effects on population and human health is scoped out of the EIA.

- Do consultees agree that it is appropriate to scope out a specific assessment of potential effects on population and human health from the EIA?

18.2 Risk of Major Accident and/or Disaster

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

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

It is therefore proposed that risk of major accidents and or disaster is scoped out of the EIA.

- Do consultees agree that it is appropriate to scope out risk of major accidents and/or disaster from the EIA?

18.3 Air Quality

The air quality at this site is expected to be good due to the rural location, with few pollution sources. The main pollution source is likely to be local emissions from traffic on the A712 and A714.

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

Construction activities (such as borrow pit works) have the potential to generate dust during dry spells, which may adversely affect local air quality. Given the scale and nature of construction activities and given the distance between construction areas and the nearest residential properties, it is considered that dust from construction is unlikely to cause a nuisance.

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

Relevant mitigation measures for air quality and pollution control during construction will be captured within the Site-specific CEMP.

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

- Do consultees agree that it is appropriate to scope out air quality (including potential dust impacts) from the EIA?

18.4 Waste Strategy

Construction activities have the potential to generate waste. Relevant mitigation measures and strategies for waste management encompassing the minimisation of waste and the removal of waste from site will be captured within the Site-specific CEMP. The CEMP will be agreed with D&G Council prior to the commencement of works on Site.

It is therefore considered that waste strategy does not warrant its own Chapter in the EIA.

- Do consultees agree that it is appropriate to scope out waste strategy from the EIA?

19 Summary

This Environmental Impact Assessment Scoping Report outlines the proposed technical and environmental assessments that will be included within the EIAR for the Proposed Development. The proposed scope and methodologies for each assessment have been provided and the guidance to be followed set out. Should any further information be required in order that a full EIA Scoping Opinion can be provided we would be happy to provide further information and/or discuss any further requirements.

A summary of the topics to be scoped in or out of EIA is noted in **Table 19.1** below.

Table 19.1 Summary of EIA Topics Scoped In or Out

EIA Topics	Scoped In or Out
LVIA	Scoped In
Cultural Heritage	Scoped In
Ecology	Scoped In
Ornithology	Scoped In
Geology, Hydrology, Hydrogeology and Peat	Scoped In
Transport and Access	Scoped In
Noise	Scoped In
Aviation and Radar	Scoped In
Socio-Economics	Scoped Out
Forestry	Scoped In
Carbon Balance	Scoped In
Shadow Flicker	Scoped In
Telecommunications	Scoped In
Population and Human Health	Scoped Out
Risk of Major Accident and/or Disaster	Scoped Out
Air Quality	Scoped Out
Waste Strategy	Scoped Out

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There is no guidance defining what the extent of an appropriate 'study area' should be for the archaeological and cultural heritage assessment of wind farms. Any given study area will therefore represent an exercise in professional judgment, refined to point of agreement between stakeholders during consultation.

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Blair Hill Wind Farm

Cultural Heritage - Appendix 6.1 and 6.2

Author	SLR Consulting Limited
Date	27/07/2023
Ref	6389

Appendix 6.1: Cultural Heritage Appraisal

An initial appraisal of cultural heritage assets within 10km has been undertaken as per the proposed study area.

Scheduled Monuments

Designation Reference	Designation Title	Category	Turbine Visibility	Distance to nearest Turbine	Direction to nearest turbine	Appraisal
SM4286	Minnoch, Old Bridge of	Secular: bridge	2	4.4	Southeast	The asset, a 17th/18th century bridge, crosses the Water of Minnoch and is thought to have been a pack horse bridge, providing a river crossing for locals. There is no modern path or track connecting to the bridge. The asset's setting comprises the river, which provides the context for the bridges historical use. Views of the site are limited from the asset and are peripheral to key views across the river. As such, the Proposed Development is not predicted to impact the ability to understand, appreciate, and experience the asset. It is excluded from further assessment.
SM4815	Corrafeckloch, hut circle and field system 1150m SE of	Prehistoric domestic and defensive:	22	9.8	Southeast	The asset comprises a hut circle and associated cultivation remains. The asset is located on a southwest facing slope, which meets the Cree River 2km to the south. The asset is located

		hut circle, roundhouse				c.0.5km east of Creebank Burn. The asset's setting contributes to its significance, with the asset utilising the orientation of the landscape and proximity to water for agricultural purposes, as well as its position above the River Cree for defensive purposes. Whilst its connection to the local landscape is important in understanding the asset, the proposed development site does not contribute to the assets significance. As such, the proposed development is not predicted to impact the ability to understand, appreciate, and experience the asset. It is excluded from further assessment.
SM5676	Napper's Cottage, chambered cairn	Prehistoric ritual and funerary: chambered cairn	20	0.5	Within Site	Scoped In
SM10385	Cordorcan, cairn 750m NE of	Prehistoric ritual and funerary: cairn (type uncertain)	22	0.6	Northeast	Scoped In
SM1044	The Thieves, standing	Prehistoric ritual and funerary:	22	0.5	Within Site	Scoped In

	stones, Blair Hill	standing stone				
SM1004	Boreland, chambered cairn	Prehistoric ritual and funerary: chambered cairn	7	1.5	Northeast	Scoped In
SM1107	Minnigaff, Old Church	Ecclesiastical: church	22	3.0	North	The church is situated at the confluence of the River Cree and the Penkiln Burn, adjacent to the site of the Minnigaff motte (SM1054) and north of the village of Minnigaff. The church itself is mostly 17th century in date, however, there has been a church on the site since at least 1209 and may have been contemporaneous with the motte to the south. The asset derives its significance from its architectural interest and ability to provide further information on medieval Christianity and the reformation. The asset's setting does form part of its significance, with its proximity to the potentially associated motte and the nearby village informing its position. Views from the asset towards the village and the motte will not include the proposed development. Some views towards the asset may include the proposed development, however, these are not anticipated to be key views. As such, the

						proposed development is not predicted to impact the ability to understand, appreciate, and experience the asset. It is excluded from further assessment.
SM11054	Minnigaff, motte S of Monigaff Parish Church	Secular: motte	13	3.1	North	The asset comprises a medieval motte, visible as an upstanding earthwork. The motte is located at the confluence of the Penkiln Burn and the River Cree, on a promontory. The potentially associated Minnigaff Old Church (SM1107) is located directly to the north and the village of Minnigaff is located to the south. The asset's setting does contribute to its significance, with the use of the rivers and promontory to provide a natural defence. The asset would have had visibility along the river to the south and would have controlled the valley. The proposed development would not feature in key views to the south, and would be peripheral to views along the two rivers to the north. The proposed development has the potential to be visible in views along the river from the south towards the asset, however, the village of Minnigaff, which surrounds the asset, would provide more of a distraction to the ability to understand and appreciate the assets setting. As such, the proposed development is not predicted to impact

						the ability to understand, appreciate, and experience the asset. It is excluded from further assessment.
SM1126	Machars Hill motte	Secular: motte	22	6.5	Northwest	Scoped In.
SM1021	Drumwhirn, cairn N of Boreland	Prehistoric ritual and funerary: cairn (type uncertain)	22	2.6	Northeast	Scoped In
SM2023	Skaith Mote, motte 700m SSW of Challoch	Secular: motte	22	5.0	Northeast	The asset, a motte, is located in the lowland valley area c.1.3km southwest of the River Cree. The asset is also c.2.8km west of the Minnigaff Motte (SM11054), potentially contemporaneous in date. The asset's setting contributes to its significance, with the asset utilising the lowland landscape to provide views along the river and help control the valley. Furthermore, intervisibility with the Minnigaff Motte may have been important, providing control over the entire valley. Whilst the proposed turbines are anticipated to be visible from the asset, they will be peripheral to key views along the river valley from the asset, along the river towards the asset and will not feature in any views towards the nearby motte. As such, the proposed

						development is not predicted to impact the ability to understand, appreciate, and experience the asset. It is excluded from further assessment.
SM1019	Drumfern, cairn and remains of stone circle	Prehistoric ritual and funerary: cairn (type uncertain)	22	1.1	Within Site	Scoped In
SM1048	White Cairn, cairn 910m NNE of Bargrennan Cottage	Prehistoric ritual and funerary: cairn (type uncertain)	22	8.8	Southeast	Scoped In
SM1049	White Cairn, chambered cairn 630m W of Glentrool School	Prehistoric ritual and funerary: cairn (type uncertain)	20	7.6	Southeast	Scoped In
SM1966	Deil's Dike, linear earthwork, Hill of Ochiltree	Prehistoric domestic and defensive: linear earthwork	22	7.5	East	Scoped In.
SM2266	Loch Ochiltree, crannogs	Prehistoric domestic and	0	8.6	East	Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. In addition, the proposed development is not

		defensive: crannog				anticipated to impact on the ability to understand or appreciate the shared intervisibility between contemporary assets, in this case the multiple crannogs under the same designation, in the factors which contribute to their significance.
SM7916	Garlies Castle	Secular: castle	7	0.3	Northwest	Scoped In
SM2316	Cairnsmore of Fleet, cairn	Prehistoric ritual and funerary: cairn (type uncertain)	22	8.4	Northwest	Scoped In
SM1015	Dalvaird, cairn 320m NNE of	Prehistoric ritual and funerary: cairn (type uncertain)	14	0.5	Within Site	Scoped In
SM1017	Creebridge, cairn 400m E of	Prehistoric ritual and funerary: cairn (type uncertain)	22	3.8	North	The asset, a prehistoric cairn, is located within the village of Minnigaff, surrounded by roads and residential development. The asset's original setting, along the east bank of the River Cree, would have contributed to its significance, as cairns are believed to have often acted as markers or points of reference along waterways. However, the modern development surrounding

						the asset has obscured views of the river, views of the asset from the river, and has obscured views of any nearby contemporaneous heritage assets (e.g., SM1021). As such, the asset's current setting does not contribute to its significance and the addition of the proposed turbines to the north would not impact the ability to appreciate, understand or experience the asset. It is scoped out of further assessment.
SM1938	High Baltersan, cairn	Prehistoric ritual and funerary: cairn (type uncertain)	0	7.8	North	Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. In addition, the proposed development is not anticipated to impact on the ability to understand or appreciate the shared intervisibility between contemporary assets (e.g., SM2316) in the factors which contribute to their significance.
SM1943	Middle Bridge of Cree, cairn 110m WNW of	Prehistoric ritual and funerary: cairn (type uncertain)	12	6.6	Southeast	The asset is located directly to the west of the River Cree, within the small settlement of Bargrennan. The A714 runs adjacent to the River Cree, crossing c.90m south of the asset. The asset's original setting would have formed part of the asset's significance, with the asset acting as a marker or monument along the river for those travelling through the landscape. Furthermore, the asset has potential intervisibility with a single

						nearby cairn (SM1021), which lies c.8.5km to the southeast. The asset is currently obscured from view when approaching from the south, along the river, by domestic development. As such, the ability to appreciate the connection of the asset to the landscape when approaching from the south or looking towards the south has been impacted by the existing built environment. Whilst the proposed development may be visible from the asset, or whilst approaching the asset along the river, the assets current setting means that the proposed development will be a minor distraction within an already impacted setting. As such, the proposed development is not predicted to impact the ability to understand, appreciate, and experience the asset. It is excluded from further assessment.
SM13752	Blackcraig lead mines, lade and miners' cottages, Blackcraig	Industrial: mines, quarries	0	5.0	Northwest	Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. Furthermore, there are no additional assets or third viewpoints from which shared visibility is important to the significance of the asset.

Listed Buildings

Designation Reference	Designation Title	Category	Turbine Visibility	Distance to nearest Turbine	Direction to the turbine	Appraisal
LB13106	Shennanton House	A	22	9.5	Northeast	The asset is an early 20th century vernacular country house. Its English Tudor and vernacular style is unique and of architectural interest for the region. The asset's setting comprises a circular opening of lawn within dense woodland, over 0.5km to the southwest of River Bladnoch. The house is concealed by woodland until entering into the opening along the drive, passing from an opening in the north and southeast of the grounds. The contributing aspects of the assets setting are considered to be the lawn space around the house, the drive, and the woodland. These features create an isolated

						space and provide viewpoints to the asset. The ZTV analysis indicates that 22 of the proposed turbines would potentially be visible from the asset. Any views of the turbines within the Site would minor considering the asset is 9.5km from the nearest turbine. Additionally, the turbines would cause no intrusion upon any of the contributing aspects of the assets setting or effect the ability to understand, appreciate or experience the asset within its setting. Therefore, it has been scoped out of further assessment.
LB19190	Challoch, All Saints Episcopal Church With Boundary Walls And Gatepiers	A	22	4	Northeast	The designation includes the mid-19th century church and boundary walls. The asset is considered highly significant due to its architectural interests and its completeness, primarily the fine furnishings within the church. The church also has historical interests, having the alter, lectern and font

						bequeathed by Sir Thomas Dick Lauder and the Earl of Galloway. Lauder was a Baronet, but also a writer, scientist, and artist, and both individuals are historical figures who held high positions. The church is located directly to the west of the A714 and north of the B7027, on a slight hill with views of the surrounding landscape. The River Cree is c.170m to the east. The asset derives its setting from its position in the landscape, which provided migration routes via the main roads, and its position which made it a prominent feature upon approaching the church. The ZTV analysis indicates that 22 turbines would be visible from the asset. The introduction of visible turbines within the assets setting, 4km to the northeast, would not cause any effects upon the contributing aspects of the asset setting, which are the main roads

						and its visibility within the landscape. The ability to appreciate, understand and experience the asset through its architectural, historical interests and its setting would remain intact. Therefore, it has been scoped out of further assessment.
LB19313	Monigaff Parish Church Graveyard, Heron Monument	A	22	3	North	The asset is an 18th century graveyard in memory of the Heron family, situated within the west of the Monigaff Parish Church. The classical monument represents a memorial for the Heron family, who occupied the Kirroughtree House and estate from the 14th/15th centuries till the late 19th century. The monument is of architectural interest due both its unique, quality design, but also due to its preservation. It also has historical interests, being associated with high class, established historic families within the region.

						The asset's setting comprises the churchyard to the west of the Minnigaff, Old Church remains (SM1107) and the Monigaff Parish Church, Graveyard and Graveyard Walls (LB19312), located between the River Cree and Penkiln Burn, to the west of Minnigaff. The asset's setting contributes little to its significance; whilst it provides an indication of the Heron family's presence within the settlement of Newton Stewart, and its associations with the previous church, its primary significance derives from its architectural and historical interests. The ZTV analysis indicates that 22 of the proposed turbines would be visible from the asset. The introduction of visible turbines 3km to the north of the asset would cause no impacts to the assets setting. Its interpretability within the church yard would remain intact, and the ability to

						appreciate, understand and experience the asset would remain unaffected. Therefore, the asset has been scoped out of further assessment.
LB38663	Church Street, Penninghame Parish Church, St John's (Church_Of Scotland), Boundary Walls And Railings	A	22	4.1	North	The asset is an early 19th century Cruciform gothic church, designed by William Burn, a famous architect who's other works include Balintore, Inverness and Dundas Castles. The church is located within the south of the Newton Stewart Conservation Area along Church Street, with a sports green to the north, and a mixture of residential and commercial buildings within its vicinity. The church's significance derives from its architectural interests; it is an impressive and unique building and contributes toward the character of the Newton Stewart Conservation Area. The asset derives no significance from its setting. The visibility of 13

						turbines indicated by the ZTV analysis is anticipated to cause no effects to the ability to appreciate, understand and experience the church, and therefore it has been scoped out of further assessment.
LB38667	Cree Bridge	A	13	3.9	North	The asset it an early 19th century stone bridge built by John Rennie, connecting the Newton Stewart and Minnigaff areas together over the River Cree, located roughly within the centre of the Newton-Stewart Conservation Area. The asset's significance derives from its architectural interest, as an example of an early 19th century bridge architecture, as a 5-span stone bridge with 5 depressed-arch spans and bull-nosed cutwater buttresses made of ashlar and red sandstone masonry, with cast-iron lampbrackets. The bridge contributes toward the character of the Newton-Stewart Conservation Area. The aspect of its setting that contribute to its

						significance are the River Cree, which it provides its functional context. The ZTV analysis indicates that there is potential visibility of 13 turbines from the asset. Any visibility of the proposed turbines would not effect the intelligibility of the asset with the River Cree. The ability to appreciate, understand and experience the asset would remain unaffected, and therefore it has been scoped out of further assessment.
LB38672	King Street, Douglas House, Former Douglas School	A	22	3.2	North	The school is a classical, symmetrical style building incorporating an older gabled building to the north, designed by the architect John Jenderson of Edinburgh in 1834. The architecture of the building is unique and built with a high level of detail and quality. The building has both architectural and historical interests, associated with historical figures such as John

						Henderson, Samuel Douglas of Jamaica and Lord Garlies, Earl of Galloway. The asset is located on the northeast side of King Street (A714) and has green lawn to the east of the building, c.100m to the west of River Cree. The ZTV analysis shows the potential of 22 of the proposed turbines being visible from the asset. The setting of the building contributes no significance to the asset; it does not contribute to the ability to understand, appreciate or experience the assets architectural and historical interests.
LB17052	Cumloden House	A	21	1.7	North	Cumloden House is an early 19th century Gothick cottage house, with early 19th century category B Listed estate buildings. The setting of this group of buildings comprise the estate grounds which utilise
LB17037	Cumloden, Garden Cottage And Walled Garden	B	22	1.4	North	
LB17037	Cumloden, Garden Cottage And Walled Garden	B	22	1.4	North	
LB17051	Cumloden, Glenmalloch Lodge	B	22	1.2	North	

LB17054	Cumloden Stables, Archway And Sundial	B	22	1.7	North	woodland, grass areas and the Penkiln Burn to create natural enclosures on its designed border and featured spaces. The key approach into the estate is from the southeast and approaches the stables and main house. The estate is designed to be appreciated from within the estate, with woodland forming a boundary around the grounds. The estate comprises a number of buildings of architectural interest within the contained associated landscape and contribute to the group significance of the estate buildings. The ZTV analysis indicates that 21 to 22 of the proposed turbines are predicted to be visible from within the vicinity of the assets and within the estate. The visibility of the turbines to the north of the group of assets would not be considered impact any of the contributing aspects of the asset group, including its setting. In

						all cases, the ability to understand, appreciate, and experience the assets within the estate would remain intact, as all key views would remain intact. Therefore, it is excluded from further assessment.
LB17039	Auchinleck, House	B	15	2.5	West	The asset is a mid-19th century vernacular L-plan farmhouse of with Baronial details. Its setting is an agricultural landscape around the asset, Penkiln Burn to the west and woodland plantations to the north and west. The significance of the asset derives from its architectural and historical interests, being an example of a mid-19th century vernacular dwelling built by Randolph, the 19th Earl of Galloway. The asset does not derive any significance from its setting. Any visibility of the proposed turbines would not affect the ability to understand, appreciate and experience the

						cultural significance, and therefore it is excluded from further assessment.
LB17055	Cumloden Waulkmill	B	21	2.6	North	The asset comprises a 19th century former waulk-mill, converted to residential use in 1971. It was used till the 1920s for the production of blankets and plaid by spinning and weaving using machinery across multiple floors. The asset's contributing setting comprises the Penkiln Burn, which has functional associations with the asset to drive the machinery. The asset's significance derives from its historical and architectural interests. It also derives its significance through its setting, which comprises the Penkiln Burn within the vicinity of the asset. The ZTV analysis indicates that the 22 of the proposed turbines would be visible from the asset and its setting. The visibility of any turbines would not effect the

						ability to appreciate, understand or experience the asset and its setting. It will cause no effects to the assets contributing aspects to its cultural significance and therefore is scoped out of further assessment.
LB17056	Drannandow, Farmhouse	B	22	2.4	Within Site	Scoped In.
LB17061	Kirkton House	B	22	2.9	North	Kirkton House is a late 18th century manse, built for the Monifaff Parish Church, now comprising mostly mid-19th century repairs and alterations and flanking wings. The buildings significance derives from its historical and architectural interests, not from its setting. Any visibility of the proposed turbines would cause no effects upon the ability to appreciate, understand and experience the asset and therefore it is scoped out of further assessment.
LB19192	Challoch Farmhouse And Steadings	B	22	4.4	Northeast	The asset comprises a 19th century farmhouse and courtyard steadings, comprising an asymmetrical

						farmhouse. Although the ranges and the house have been renovated, they still represent some preserved aspects of vernacular architecture of the 19th century. The asset is situated in an agricultural landscape to the west of the River Cree. The asset derives its significance primarily from its historic and architectural interests. The setting of the asset, which comprises the agricultural setting around the asset, also contributes a small part to the understanding of the asset, being an agricultural building with its associated landscape. Any visibility of the proposed turbines would cause no effects upon the ability to understand, appreciate and experience the asset and its relationship with its setting, as no key views or aspects would be interrupted or removed. Therefore, it has been scoped out of further assessment.

LB19312	Monigaff Parish Church, Graveyard And Graveyard Walls	B	22	3.0	North	The asset is an early 19th century Gothic style church and boundary wall containing a graveyard, built by William Burn. The church is located within the north of Monigaff (Minnigaff), located on the west side of Penkiln Burn, approached via a bridge to the south from the main settlement. The design is similar to that of Burn's earlier church at Stenton, East Lothian and his parish church in Thurso. The church, church walls and graveyard's significance derives from its architectural and historical interest, being a central and cultural part of the historic community within Monigaff and having a high level of architectural quality of materials and design, with a well-known architect. The setting of the church does not contribute to the church's significance; it does not contribute to the ability to appreciate,

						understand and experience the asset, and therefore has been scoped out of further assessment.
LB19319	Queen Mary's Bridge (Also known as Penkill Old Bridge)	B	21	2.6	North	The bridge, built in 1960, has been replaced two previous bridges in the 18th and 16th centuries. It forms a footbridge over Penkiln Burn to the north of Newton Stewart. The bridge is also known as Queen Mary's Bridge, supposedly because Mary Queen of Scots crossed it during her royal procession in 1563. The bridge's significance derives from its historical and architectural significance, having replaced the location of a historic bridge and its association with historical figures. Its presence maintains the historic pathway. It derives some significance from its setting, which comprises the Penkiln Burn over which it is built, part of its functional understanding. The ZTV indicates that 21 of the proposed turbines would be visible from the asset. Any visibility of the turbines

						would cause no effects; the ability to understand, appreciate and experience the bridge would remain intact, and therefore it is scoped out of further assessment.
LB19321	Whitehills	B	22	2.8	North	An early 20th century Arts and Crafts style house, located to the north of River Cree within Gill Wood. The asset's significance derives primarily from its architectural interests, having a design that imitates C F A Voysey. The asset's significance derives from its architectural significance, not its setting, and therefore is scoped out of further assessment.
LB38670	23 King Street, Former Brewery House	B	22	3.6	North	The asset is an early 19th century former brewery house, a 2-storey, 3-bay symmetrical fronted house. Its setting comprises King's Street to the west and the River Cree to the east. It is located on the east side of King's Streeth, to the west of the River Cree, to the northwest of the Newton Stewart Conservation Area.

						The asset primarily derives its significance through its architectural interests. Its setting contributes partially to its significance, as the River Cree would have provided water for the brewery and King's Street would have been a key for importing and exporting materials. The ZTV analysis indicates that 22 of the proposed turbines would be visible from the asset. Views of the turbines to the north would not cause any effects on the ability to appreciate, understand and experience the asset within its setting. Therefore, it has been scoped out of further assessment.
LB38671	King Street Corsbie West	B	22	3.4	North	The asset comprises an example of an early 19th century L-plan house. Its setting comprises the northwest extent of the Newton Stewart settlement, being located to the west of King's Street. The asset's significance derives from its architectural interest; it does not

						derive its significance from any of the aspects of setting. Any visibility of the proposed turbines would cause no effects to the ability to appreciate, understand and experience the asset, and therefore it is scoped out of further assessment.
LB38674	King Street, Little Corsbie	B	22	3.4	North	The asset comprises an example of a late 18th century 2-storey, 3-bay fronted house with a rear wing. Its setting comprises the northwest extent of the Newton Stewart settlement, being located to the west of King's Street. The asset's significance derives from its architectural interest; it does not derive its significance from any of the aspects of setting. Any visibility of the proposed turbines would cause no effects to the ability to appreciate, understand and experience the asset, and therefore it is scoped out of further assessment.

LB38675	Penkiln Suspension Footbridge	B	10	3.2	North	The suspension bridge was built in the early 20th century and connected the northeast and northwest parts of Newton Stewart on either side of the River Cree. The bridge was built by D H and F engineers and comprises a wrought iron suspension footbridge. The bridge's significance primarily derives from its architectural interests, as an example of a Victorian wrought iron suspension bridge. It's setting also contributes toward its significance, being the River Cree, which contributes to how the asset is understood. The ZTV indicates that 10 of the proposed turbines would be visible from the asset. Any visibility of the turbines would cause no effects; the ability to understand, appreciate and experience the bridge would remain intact, and therefore it is scoped out of further assessment.

LB38683	Queen Street, The Mart, Sale Hall, Office And Railings	B	22	4.6	North	The designated asset comprises the early 20th century Newton Stewart cattle market, comprising a sale hall built in an octagonal plan, and offices. It's setting comprises Newton Stewart, a settlement along the River Cree, and the crossroads between the Wigtown Road (A714) and B7079. Its architecture is similar to the in New Market Street, Castle Douglas. The building has historical and architectural interest, having been the centre of the Newton Stewart economy during the 20th century, and having a high level of architectural quality. The contributing factor of the assets setting would be its position next to two major roadways south of Newton Stewart's core settlement at the time in 1900, contributing to the understanding of the asset's use as an accessible and central marketplace to gather and trade.

						The introduction of 22 potentially visible turbines within the Site to the north would cause no changes or effects upon the ability to understand, experience and appreciate this asset and its setting, and therefore it is scoped out of further assessment.

Conservation Table

CA Reference	CA Name	Contained Category B Listed Buildings		Turbine Visibility	Distance to nearest turbine	Direction to nearest turbine	Appraisal comments
CA328	Newton Stewart	LB19299	Minnigaff, Millcroft Road, Minnigaff Mill	22	3.6km	North	Newton Stewart is a small market town based along the River Cree, with the designated area outlining areas on both sides of the River including Minnigaff, Creebridge and Newton Stewart. The Conservation Area has archaeological, historical, architectural interest, characterised by a mixture of locally sourced stone used in various ways to which contribute to the area's character. The Conservation Area also derives its significance through its setting. The key aspects of the assets setting are the River Cree and Penkiln Burn, important water sources for agricultural, brewing, mills, and transport, particularly to the coast to the south.
		LB38655	Albert Street, Bank Of Scotland				
		LB38662	Church Street, Penninghame Graveyard With Mausoleum				
		LB38669	Dashwood Square, The Mcmillan Hall, Railings And Gates				
		LB38676	2, 4, 6 Princes Street And 1 Dashwood Square				
		LB38677	Princes Street, Glenkiel House Former Penninghame Manse With Coach House, Gates, Gatepiers And Railings				

		LB38678	Princes Street, Former St Johns Church Hall				The ZTV analysis indicates that all 22 of the proposed turbines would have some degree of visibility from within the Conservation Area. The visual and special associations between the contributing aspects of the conservation area's character and setting would remain unaffected by the visibility of these turbines. The ability to appreciate, understand and experience the key contributing aspects of the Conservation Area, including its character and setting, would remain intact. Therefore, the asset and all designations within are scoped out of further assessment.
		LB38680	2 Queen Street, Dashwood House				
		LB38684	1 Victoria Street				
		LB38685	69-73 (Odd Nos) Victoria Street				
		LB38686	77-79 (Odd Nos) Victoria Street, Old Town Hall				
		LB38688	2 Victoria Street, The Central Bar				
		LB38694	30 And 32 Victoria Street				
		LB38696	40-44 (Even Nos) Victoria Street, The Royal Bank Of Scotland				

		LB38697	Victoria Street, The Galloway Arms Hotel				
		LB38699	76-78 (Even Nos) Victoria Street And Boundary Walls				
		LB38700	Victoria Street, Monument To 9th Earl Of Galloway				
		LB38701	Windsor Road, Roman Catholic Church Of Our Lady And St Ninian And Churchyard				
		LB38702	Windsor Road, Roman Catholic Presbytery And Churchyward With Boundary Walls, Gatepiers, Gates And Railings				
		LB38703	York Road, Former Douglas-Ewart High School, Hill View Apartments				
		LB38704	York Road, Former Uf Church, Now Newton				

			Stewart Museum With Boundary Walls Gatepiers, And Railings				

Dumfries and Galloway Non-Inventoried Designed Landscapes (NIDL)

NIDL/Listed Building Reference	NIDL/Listed Building Name	Turbine Visibility	Distance to nearest turbine (km)	Direction to nearest turbine	Appraisal comments
MDG25548	Kirroughtree	0 - 22	3.2	North	The Non-Inventoried Designed Landscape[1] (NIDL) and Listed Buildings collectively comprise the remnant Kirroughtree estate, with the main house and Doocot which have early 18th century origins date to the late 18th to early 19th century. The NIDL comprises the land in which the estate buildings are located within, comprising gardens woodland, lawn, pathways and landscape features which are not designated. First Edition OS mapping indicates that in the 19th century the estate had stables, an icehouse (LB17065), a hot house, greenhouse, a hermitage, fountains and a walled garden to the northwest of the main house (1851 OS, Kirkcudbrightshire, Sheet 35). The larger estate comprised drives and pathways, landscaping such as Lessons Park to the southeast, plantations
LB17063	Kirroughtree, Doocot (Category B)	0	3.2	North	

[1] A Non-Inventoried Designed Landscape comprises an outlined area by the local authority as a non-designated heritage asset. These typically form designed gardens and landscapes which are not designated.

LB17064	Kirroughtree House Hotel (Category B)	4	3.4	North	and decorative planting such as tree lines to create separate spaces, pathways and view corridors. Not all of the aspects of the historic estate are intact. The remaining aspects of the NIDL and Listed Buildings form a group of assets which derive their setting from the following preserved aspects; • The Kirroughtree (Kirouchtree on the 1851 OS Mapping) house at the centre, now known as Kirroughtree House Hotel (LB17064); • Kirroughtree Doocot (LB17063); • the woodland plantation which included the hermitage, located to the south of the hotel (1851 OS, Kirkcudbrightshire, Sheet 35); • the main drive and approach to the house from the southeast and some of the pathways proximate to the house (1851 OS, Kirkcudbrightshire, Sheet 35); • Lessons Park, a landscaped lawn to the southeast of the house, which the main drive passes through (1851 OS, Kirkcudbrightshire, Sheet 35); • The old bowling green to the north of the house (1851 OS, Kirkcudbrightshire, Sheet 35); and • The woodland to the northwest, north and northeast which creates a boundary and backdrop to the estate, named the Wild Wood to the north and Beech Wood to the northeast on the 1851 OS, Kirkcudbrightshire, Sheet 35. The estate has a high level of architectural, archaeological and historical interest, including a discernible landscaped estate with the principle house still focused at the centre. The remains of the Kirroughtree estate provide a setting of the surviving estate buildings; it forms their historical context, approaches, views and contribute to the ability to appreciate, understand and experience the assets within their intended setting, although somewhat eroded.

					The contributing aspects of the NIDL and listed building's setting does not extend past the historical boundary of the estate, outlined in the NIDL. Views and landscapes outside of the estate boundary do not comprise part of or contribute toward the significance of the asset's setting. The ZTV indicates that 0 to 22 turbines would be visible throughout the NIDL boundary; with no turbines visible within the vicinity of the Doocot and up to 6 turbines visible proximate to the house hotel. Any visibility of the turbines within the extent of the NIDL would not cause any effects upon the ability to understand, appreciate or experience the NIDL and listed buildings within; in all cases the ability to interpret the estate's context and design would remain intact. Therefore, the assets have been scoped out of further assessment.
MDG25683	Castle Stewart	22	3.km	East	Castle Stewart (LB19189) is a Category B Listed Building located within the non-inventory designed landscape. The building is a 15th to 16th century tower house, located within an associated designed landscape. The castle is based to the west of the River Cree and directly north of Castle Stewart Burn. The contributing aspects of Stewart Castle and the designed landscape's setting comprises: • Category B Listed Castle Stewart (**LB19189**); • Castle Stewart Burn; • Penninghame Pond, which was formed via a dam, as labelled on the 1846 OS mapping;

LB19189	Castle Stewart (Category B)	22	3.8km	East	• Castle Stewart Bridge, which crosses Castle Stewart Burn to the east of the castle, providing the approach to the main drive; • The Castle Stewart Park, with a number of small woodland plantations (now occupied as agricultural land); • Cruives Wood to the north of the castle; • Glenrazie Wood, to the west of the castle across the Castle Stewart Burn; • Rocky Heath Pasture. Overall, the Castle and the designed landscape around the castle comprise a group asset, with architectural, historical and archaeological interests, and the designed landscape forming the setting of the listed building. The ZTV analysis indicates that 22 of the proposed turbines would have some degree of visibility from the asset. The landscape within the Site, or views toward the Site, is not part of the setting of the castle nor the designed landscape in which it is located. Whilst there may be views of up to 22 turbines c.3.8km to the east, the views in the direction of the Site or any visibility of turbines would cause no effect on the setting of Castle Stewart or the overall NIDL. The approach to the castle from the east and on Castle Stewart bridge, views of the designed landscape intended for the castle, and the association of the castle with the woodland and water course for resources would remain intact. The intelligibility of the castle and its intended setting would remain unchanged. The ability to appreciate, understand and experience the designed landscape and Castle Stewart would remain unaffected, and therefore has been scoped out of further assessment.

MDG25684	Penninghame House	22	2.8	Northeast	Penninghame House is a 19th century Category B group of buildings, comprising the three primary buildings within a designed landscape, forming the Penninghame Estate. The estate has architectural and historical interest, by the design and layout of the landscape and the building quality being built by Brown and Wardrop. First Edition OS mapping (1846) shows the estate as a roughly linear landscape, formed along the space between the A714 and the River Cree, with the main buildings within the centre. The designed landscape and the listed buildings derive their setting from one another, as well as the River Cree, which forms a water feature and estate boundary. The contributing aspects of the setting are as follows; • The River Cree, forming a water feature along the east border of the estate, with pathways and outlined gardens formed proximate to it; • The three entrances and approaches to the estate, marked by the North Lodge, Mid Lodge and South Lodge. The north approach is the historical primary approach along a straight drive through an area of lawn with tree lines. The north drive is no longer in use but discernible; • The walled garden to the west of the house, and stables to the northwest along with the historic pathways which form the routes within the estate; and • The mix of lawn and woodland that create purposeful viewpoints within the estate to buildings. The ZTV analysis indicates that 22 of the proposed turbines would have some degree of visibility from the asset. The contributing aspects of the asset's setting are contained within the boundary of the Penninghame House NIDL, with the exception of the River Cree, forming the eastern
LB19200	Penninghame Open Prison (Formerly Penninghame House) with stables and walled garden (Category B)	22	2.9	Northeast	

					boundary. The NIDL's setting includes the River Cree and the routes along the west of the river's edge, which are more likely to have visibility of the proposed turbines due to vegetation within the estate. Visibility of any proposed turbines eastward toward the Site from this part of the setting would not affect any intelligibility of the River Cree's association with the NIDL or the overall estate. Visibility of the turbines would not affect the ability to appreciate, experience and understand the relationships of the Category B Listed Buildings, the NIDL and the River Cree and how they form the setting of the contained heritage assets would remain intact. Therefore, it has been scoped out of further assessment.

Appendix 6.2: Cultural Heritage Gazetteer of Assets within the Site

SLR Number	HER Reference	Site Name	Site Type	Period	Significance
SLR1	N/A	N/A	Unrecorded	Undated	Unknown
SLR2	N/A	N/A	Unrecorded	Undated	Unknown
SLR3	N/A	N/A	Sheep ree	Undated	Unknown
SLR4	N/A	N/A	Sheep ree	Undated	Unknown
SLR5	N/A	N/A	Sheep ree	Undated	Unknown
SLR6	N/A	N/A	Sheepfold	Undated	Unknown
SLR7	N/A	N/A	Unrecorded	Undated	Unknown
SLR8	N/A	N/A	Sheep Ree	Undated	Unknown
SLR9	N/A	N/A	Sheep rees	Undated	Unknown
SLR10	N/A	N/A	Enclosure	Undated	Unknown
SLR11	N/A	N/A	cottage	Undated	Unknown
SLR12	N/A	N/A	cottage ?	Undated	Unknown
SLR13	N/A	N/A	Shed	Undated	Unknown
SLR14	N/A	N/A	Building?	Undated	Unknown
SLR15	N/A	N/A	Corn Kiln	Undated	Unknown
SLR16	N/A	N/A	Named sairn	Undated	Unknown
SLR17	N/A	N/A	Rig	Undated	Unknown
SLR18	N/A	N/A	Sheep ree	Undated	Unknown
SLR19	N/A	N/A	Ruin	Undated	Unknown
SLR20	N/A	N/A	Sheep ree	Undated	Unknown
SLR21	N/A	N/A	Sheep ree	Undated	Unknown
SLR22	N/A	N/A	Shepherds cairn	Undated	Unknown
SLR23	N/A	N/A	Building, field system	Undated	Unknown
SLR24	N/A	N/A	Sheep ree	Undated	Unknown

SLR25	N/A	N/A	Rig	Undated	Unknown
SLR26	N/A	N/A	Sheep ree	Undated	Unknown
SLR27	N/A	N/A	Sheep ree	Undated	Unknown
SLR28	N/A	N/A	Sheep rees	Undated	Unknown
SLR29	N/A	N/A	Sheep ree	Undated	Unknown
SLR30	N/A	N/A	Sheep ree	Undated	Unknown
SLR31	N/A	N/A	Unrecorded	Undated	Unknown
SLR32	N/A	N/A	Unrecorded	Undated	Unknown
SLR33	N/A	N/A	Unrecorded	Undated	Unknown
SLR34	N/A	N/A	Unrecorded	Undated	Unknown
SLR35	N/A	N/A	Unrecorded	Undated	Unknown
SLR36	N/A	N/A	Ice House (1st OS)	Undated	Unknown
SLR37	N/A	N/A	Sheep ree	Undated	Unknown
SLR38	N/A	N/A	Sheepfold/building	Undated	Unknown
SLR39	N/A	N/A	Sheepfold/building	Undated	Unknown
SLR40	N/A	N/A	Sheepfold/building	Undated	Unknown
SLR41	N/A	N/A	Shepherd's cairn	Undated	Unknown
SLR42	N/A	N/A	Shepherd's cairn	Undated	Unknown
SLR43	N/A	N/A	Shepherd's cairn	Undated	Unknown
SLR44	N/A	N/A	Shepherd's cairn	Undated	Unknown
SLR45	N/A	N/A	Sheep ree (1st OS)	Undated	Unknown
SLR46	N/A	N/A	Sheep ree (1st OS)	Undated	Unknown
SLR47	N/A	N/A	Sheep ree (1st OS)	Undated	Unknown
SLR48	N/A	N/A	Building	Undated	Unknown
SLR49	N/A	N/A	Cairn?	Undated	Unknown
SLR50	N/A	N/A	Cairn	Undated	Unknown
SLR51	N/A	N/A	Cairn?	Undated	Unknown

SLR52	N/A	N/A	Named stone	Undated	Unknown
SLR53	N/A	N/A	Quarry	Undated	Unknown
SLR54	N/A	N/A	Quarry	Undated	Unknown
SLR55	N/A	N/A	Quarry	Undated	Unknown
SLR56	N/A	N/A	Covenanter site	Undated	Unknown
SLR57	N/A	N/A	Structure?	Undated	Unknown
SLR58	N/A	N/A	cAIRN?	Undated	Unknown
SLR59	MDG11563	Penninghame house (former open prison)	Prison; country house	19th Century to 20th Century	Regional/Local
SLR60	MDG12749	Coldstream burn mine / cruive-end / smithy hill	Mine; crushing mill; hush	18th Century to 19th Century	REGIONAL/ LOCAL
SLR61	MDG12751	Wood of cree mine	Mine	20th Century	National
SLR62	MDG13023	Craignarget / cumloden	Deer park	19th Century	National
SLR63	MDG13157	Wood of cree	Charcoal burning platform	Medieval to 18th Century	Regional
SLR64	MDG14701	Barclye	Farm; field system	Medieval to 18th Century	Regional/Local
SLR65	MDG14702	Barclye	Farmstead	Post Medieval to 18th Century	Regional/Local
SLR66	MDG14703	Barclye	Farmstead	Post Medieval to 18th Century	Other
SLR67	MDG14704	Barclye	Farmstead	Post Medieval to 18th Century	Unknown

SLR68	MDG14705	Barclye	Field system; building; structure	Post Medieval to 18th Century	Regional/Local
SLR69	MDG14706	Coldstream burn, barclye	Farmstead?	Post Medieval to 18th Century	Local
SLR70	MDG14707	Barclye	Structure	Post Medieval to 18th Century	Unknown
SLR71	MDG14708	Moor of barclye	Lynchet; site	Medieval to 18th Century	None
SLR72	MDG14709	Moor of barclye	Farmstead	Post Medieval to 18th Century	Unknown
SLR73	MDG14714	Barclye cottage	Building?	Post Medieval to 18th Century	Unknown
SLR74	MDG14794	North lodge	Sheep fold	Post Medieval to 18th Century	Unknown
SLR75	MDG14797	White hill, cordorcan burn / burnside	Farmstead; structure; boundary bank; sheep fold	Post Medieval to 18th Century	Local
SLR76	MDG14798	Pulhowan burn	Farmstead?	Post Medieval to 18th Century	Unknown
SLR77	MDG14800	Bardarroch	Building	Post Medieval to 18th Century	Unknown
SLR78	MDG14801	Bardarroch	Field boundary; field; sheep fold; wall	Post Medieval to 18th Century	Unknown

SLR79	MDG14802	Bardarroch	Field system?; sheep fold	Post Medieval to 18th Century	Unknown
SLR80	MDG14803	Pulhowan burn	Fodder store	Post Medieval to 18th Century	Unknown
SLR81	MDG14804	Silver rig loch	Fodder store	Post Medieval to 18th Century	Unknown
SLR82	MDG14805	Silver rig, bardarroch	Enclosure	Post Medieval to 18th Century	Unknown
SLR83	MDG14806	Bardarroch	Enclosure	Post Medieval to 18th Century	Unknown
SLR84	MDG14810	Washing burn / terregan	Farmstead	Post Medieval to 18th Century	Regional
SLR85	MDG14811	Cordorcan bridge / burnside cottage	Building	Post Medieval to 18th Century	Unknown
SLR86	MDG14812	Drannandow farm	Building; field boundary; wall	Post Medieval to 18th Century	Regional/Local
SLR87	MDG14813	Coldstream burn, drannandow farm	Field system; farmstead	Post Medieval to 18th Century	Regional/Local
SLR88	MDG14923	Glenshalloch / low yards	Farmstead	Post Medieval to 18th Century	Unknown

SLR89	MDG14929	Black croft	Enclosure; field; rig	Post Medieval to 18th Century	Unknown
SLR90	MDG14960	Knockman wood	Farmstead	Post Medieval to 18th Century	Unknown
SLR91	MDG14960	Knockman wood	Farmstead	Post Medieval to 18th Century	Unknown
SLR92	MDG14962	Glenmalloch	Field system; farmstead	Post Medieval to 18th Century	Regional/Local
SLR93	MDG14963	Knockman wood	Farmstead	Post Medieval to 18th Century	Regional/Local
SLR94	MDG14964	Knockman wood	Field system; farmstead	Post Medieval to 18th Century	Regional
SLR95	MDG14965	Cumloden deer park / closing	Field system; farmstead	Post Medieval to 18th Century	Regional
SLR96	MDG14966	Cumloden deer park	Building; field system; farmstead	Post Medieval to 18th Century	Local
SLR97	MDG14967	Knockbracks, cumloden deer park / knockbracks	Field system; farmstead	Unknown	Regional
SLR98	MDG14968	Garlies wood	Building	Post Medieval to 18th Century	Unknown
SLR99	MDG14969	Knockman wood	Building	Post Medieval to 18th Century	Unknown

SLR100	MDG14971	Craignarget, cumloden deer park	Kiln	Post Medieval to 18th Century	Unknown
SLR101	MDG14972	Cumloden deer park	Kiln	Post Medieval to 18th Century	Unknown
SLR102	MDG14973	Peat rig knowe, glenmalloch	Field system; building; ridge and furrow	Medieval to 19th Century	Local
SLR103	MDG14975	Knockman wood	Enclosure	Post Medieval to 18th Century	Unknown
SLR104	MDG14976	Knockman wood	Enclosure	Unknown	None
SLR105	MDG15000	Moor of barclye	Structure	Post Medieval to 18th Century	Unknown
SLR106	MDG15001	Knockman wood	Field	Post Medieval to 18th Century	Unknown
SLR107	MDG15002	Knockman wood	Field	Post Medieval to 18th Century	Unknown
SLR108	MDG15004	Glenmalloch hill	Enclosure	Post Medieval to 18th Century	Regional/Local
SLR109	MDG15196	Threave cairn, coldstream burn	Structure	Post Medieval to 18th Century	Unknown
SLR110	MDG15197	Coldstream burn	Enclosure	Post Medieval to 18th Century	Unknown

SLR111	MDG15198	Glenshalloch	Farmstead; field system; corn drying oven	Post Medieval to 18th Century	Regional/Local
SLR112	MDG15199	Glenshalloch hill	Farmstead; field system; corn drying oven	Post medieval to Modern	Unknown
SLR113	MDG15204	Glenshalloch hill	Building; field system	Post Medieval to 18th Century	Unknown
SLR114	MDG15208	Benera	Sheep fold	Post Medieval	Other
SLR115	MDG15221	Coldstream burn / threave	Farmstead; field system	Post Medieval to 18th Century	Regional
SLR116	MDG15222	Nappers cottage	Field system; farmstead	Post Medieval to 18th Century	Regional
SLR117	MDG15223	Coldstream burn	Field system; farmstead	Post Medieval to 18th Century	Unknown
SLR118	MDG15224	Nappers, moor of drannandow	Enclosure; sheep fold	Post Medieval to 18th Century	Local
SLR119	MDG15225	Nappers, moor of drannandow	Sheep fold	Post Medieval to 18th Century	Local
SLR120	MDG15226	Nappers, moor of drannandow	Sheep fold	Post Medieval to 18th Century	Local
SLR121	MDG15228	Dalvaird	Farmstead; field system; structure; corn drying kiln; sheep fold	Post Medieval to 18th Century	Regional

SLR122	MDG15229	Drumfern	Field system; farmstead	Post Medieval to 18th Century	Unknown
SLR123	MDG15230	Coldstream burn, drumfern / dargall	Farmstead; field system	Post Medieval to 18th Century	Regional/Local
SLR124	MDG15231	Coldstream burn	Field system	Post Medieval to 18th Century	Other
SLR125	MDG15232	Glenshalloch burn	Sheep fold; structure; field system	Post Medieval to 18th Century	Unknown
SLR126	MDG15233	Glenshalloch burn	Shieling?; hut	Post Medieval to 18th Century	Unknown
SLR127	MDG15234	Glenshalloch burn	Structure; sheep fold; enclosure	Post Medieval to 18th Century	Unknown
SLR128	MDG15235	Glenshalloch burn	Structure; sheep fold	Post Medieval to 18th Century	Local
SLR129	MDG15236	Glenmalloch hill	Structure	Post Medieval to 18th Century	Unknown
SLR130	MDG15237	Craigenteasy	Sheep fold	Post Medieval to 18th Century	Local
SLR131	MDG15238	Nappers, moor of drannandow	Sheep fold	Post Medieval to 18th Century	Local

SLR132	MDG15239	Cordorcan burn	Sheep fold	Post Medieval to 18th Century	Local
SLR133	MDG15240	Dalvaird	Field system	Post Medieval to 18th Century	Local
SLR134	MDG15241	Knockman	Enclosure; sheep fold	Post Medieval	Local
SLR135	MDG15242	Glenmalloch hill	Enclosure	Post Medieval to 18th Century	Unknown
SLR136	MDG15243	Glenmalloch hill	Enclosure	Post Medieval to 18th Century	Unknown
SLR137	MDG15244	Glenmalloch hill	Enclosure	Unknown	Regional/Local
SLR138	MDG15245	Dalvaird	Sheep fold; farmstead	Post Medieval to Modern	Local
SLR139	MDG15246	Knockman	Field system?; structure	Post Medieval to 18th Century	Unknown
SLR140	MDG15292	Lamachan, penkiln burn	Field; farmstead	Post Medieval to 18th Century	Regional/Local
SLR141	MDG15294	Lamachan, penkiln burn	Enclosure	Post Medieval to 18th Century	Unknown
SLR142	MDG15300	Black gairy hill	Building	Post Medieval to 18th Century	Unknown

SLR143	MDG15301	Black gairy hill	Enclosure; structure; sheep fold	Post Medieval to 18th Century	Unknown
SLR144	MDG15303	Black burn	Sheep fold	Post Medieval to 18th Century	Unknown
SLR145	MDG15306	Glenshalloch	Field boundary; sheep fold; building; wall	Post Medieval to 18th Century	Unknown
SLR146	MDG15377	Glenmalloch hill	Boundary bank	Post Medieval to 18th Century	Local
SLR147	MDG15378	Glenmalloch hill	Boundary bank	Post Medieval to 18th Century	Local
SLR148	MDG15379	Washing burn	Boundary bank	Post Medieval to 18th Century	Local
SLR149	MDG15380	Washing burn	Boundary bank	Post Medieval to 18th Century	Local
SLR150	MDG15381	Black burn	Boundary bank	Post Medieval to 18th Century	Local
SLR151	MDG15382	Cordorcan burn	Boundary bank	Post Medieval to 18th Century	Local
SLR152	MDG18456	Drannandow, farmhouse	Building	Undated	B-Listed
SLR153	MDG18814	Penninghame open prison formerly penninghame house with stables and walled garden	Country house; open training prison; health farm	19th Century to Modern	B-Listed

SLR154	MDG18835	Mattie white's bridge	Building	Undated	C-Listed
SLR155	MDG22047	Moor of barclye	Cairnfield; hut circle?; ring cairn?	Early Bronze Age to 18th Century	Unknown
SLR156	MDG22048	Barclye	Ridge and furrow	Medieval to 18th Century	Unknown
SLR157	MDG22049	Moor of barclye	Cairnfield	Early Bronze Age to 18th Century	Unknown
SLR158	MDG22050	Moor of barclye	Structure	Post Medieval to 18th Century	Unknown
SLR159	MDG22051	Moor of barclye	Cairnfield	Early Bronze Age to 18th Century	Unknown
SLR160	MDG22052	Moor of barclye	Structure	Medieval to 18th Century	Unknown
SLR161	MDG22053	Moor of barclye	Circular platform	Early Bronze Age to 18th Century	Unknown
SLR162	MDG22054	Dargall	Building	Medieval to 18th Century	Other
SLR163	MDG23598	Mattie white's bridge	Road bridge	Undated	Local
SLR164	MDG23823	Drannandow	Farmhouse; farmstead	Medieval to Modern	Unknown
SLR165	MDG24415	Penninghame open prison, stables	Stable	19th Century to Modern	Local
SLR166	MDG24416	Penninghame open prison, walled garden	Walled garden	19th Century to Modern	Local
SLR167	MDG2590	'Cruives of cree'	Wharf; fish trap	Medieval to Modern	Unknown

SLR168	MDG2591	Bessie's cairn	Cairn?	Unknown	Unknown
SLR169	MDG2593	Drumwhirn cairn	Cairn	Early Bronze Age to Late Bronze Age	National
SLR170	MDG2673	Glenhapple	Market cross?	Medieval to 19th Century	Other
SLR171	MDG2674	Drumfern	Stone circle	Early Neolithic to Early Bronze Age	National
SLR172	MDG2675	Drannandow	Cairn	Early Bronze Age to Late Bronze Age	National
SLR173	MDG2676	'Silver mine', bardarroch / silver rigg mine	Lead mine	Medieval to 19th Century	National
SLR174	MDG2677	Drumfern	Bothy; sheep fold; clearance cairn	Medieval to Modern	REGIONAL/ LOCAL
SLR175	MDG2678	Drumfern	Field boundary; clearance cairn; wall	Medieval to Modern	REGIONAL/ LOCAL
SLR176	MDG2680	St ninian's chapel / old kirk of cruives	Cemetery; chapel	Medieval to 19th Century	National
SLR177	MDG2682	Cruives of cree, glenhapple	Deserted settlement	Medieval	REGIONAL/ LOCAL
SLR178	MDG2683	Drumfern	Cairn	Early Bronze Age to Late Bronze Age	National
SLR179	MDG2684	Cordorcan burn	Cairn	Early Bronze Age to Late Bronze Age	National
SLR180	MDG2685	Cut island, river cree	Crannog?	Iron Age to Early Medieval	Regional

SLR181	MDG2687	Drannandow farm	Underground structure; cairn	Early Neolithic to Roman	Unknown
SLR182	MDG3077	Drannandow	Clearance cairn; field boundary; wall	Post Medieval to 18th Century	Other
SLR183	MDG3078	Cumloden	Enclosure	Unknown	Regional/Local
SLR184	MDG3092	Knockman wood	Enclosure; clearance cairn; corn drying kiln	Medieval to Modern	Regional
SLR185	MDG3103	Garlies castle	Tower	Medieval to 19th Century	National
SLR186	MDG3133	Garlies	Cairn	Unknown	None
SLR187	MDG3152	Knockman wood	Cup marked stone	Unknown	Other
SLR188	MDG3207	Drannandow / napper`s cottage	Chambered cairn	Early Neolithic to Early Bronze Age	National
SLR189	MDG3208	The thieves	Standing stone	Early Neolithic to Medieval	National
SLR190	MDG3209	Drannandow	Cairn	Early Bronze Age to Late Bronze Age	National
SLR191	MDG3210	Cordorcan burn	Cairn	Early Bronze Age to Late Bronze Age	National
SLR192	MDG3211	Rorie gill's cairn, drannandow	Cairn	Early Bronze Age to Late Bronze Age	Regional
SLR193	MDG3212	Benera	Enclosure; hut	Late Prehistoric to 19th Century	Unknown

SLR194	MDG5148	Murdoch's cave	Cave	Medieval to 19th Century	Other
SLR195	MDG5149	Deil's dyke	Boundary bank	Medieval to 19th Century	Local
SLR196	MDG25424	Barclye	Burnt mound	Early Bronze Age to Norse	Regional
SLR197	MDG25953	Moor of barclye	Burnt mound	Early Bronze Age to Norse	Regional
SLR198	MDG25975	Moor of barclye	Cup and ring marked stone	Bronze Age	Regional
SLR199	MDG25911	Smith hill, barclye	Burnt mound?	Early Bronze Age to Norse	Regional
SLR200	MDG25684	Penninghame house	Penninghame house		
SLR201	MDG26927	Cordorcan	Farmstead; field system	Medieval to 20th Century	Regional/Local
SLR202	MDG26928	Cordorcan burn	Field system	Medieval to 20th Century	Local
SLR203	MDG27426	Penninghame house, north lodge	Gate lodge	19th Century to Modern	Local
SLR204	MDG27967	The mill	Farmstead	Post medieval to Modern	Unknown
SLR205	MDG27968	Glenhapple	Farmstead	Post medieval to Modern	Unknown
SLR206	MDG28175	Glenshalloch	Farmstead	Post medieval to Modern	Unknown
SLR207	MDG25683	Castle Stewart	Designed Landscape	N/A	N/A
SLR208	N/A	N/A	Boundary Bank	N/A	N/A
SLR209	N/A	N/A	March Dyke	N/A	N/A
SLR210	N/A	N/A	Field sysem, rig	N/A	N/A
SLR211	N/A	N/A	Field system, rig	N/A	N/A

SLR212	N/A	N/A	Rig, field boundary	N/A	N/A
SLR213	N/A	N/A	Enclosure	N/A	N/A
SLR214	N/A	N/A	Field, cairnfield (needs HER)	N/A	N/A
SLR215	N/A	N/A	Rig cultivation	N/A	N/A
SLR216	N/A	N/A	Rig, building?	N/A	N/A
SLR217	N/A	N/A	Rig cultivation	N/A	N/A
SLR218	N/A	N/A	Rig, cairns (needs HER)	N/A	N/A
SLR219	N/A	N/A	Rig, cairns	N/A	N/A
SLR220	N/A	N/A	Relict LandscapeFES/RCAHMS)	N/A	N/A
SLR221	N/A	N/A	Relic landscape FES/RCAHMS	N/A	N/A
SLR222	N/A	N/A	Relic landscape FES/RCAHMS	N/A	N/A
SLR223	N/A	N/A	Relic landscape FES/RCAHMS	N/A	N/A