

LETHANS WIND FARM EXTENSION

SCOPING REPORT

JANUARY 2021

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1. INTRODUCTION

- 1.1 This Scoping Report (the Report) has been prepared on behalf of Banks Renewables (Lethans East Wind Farm) Limited (the Applicant). The Applicant is proposing to submit an application to the Scottish Government's Energy Consents Unit (ECU) under Section 36 (S36) of the Electricity Act 1989 to construct and operate the Lethans Wind Farm Extension (the Proposed Development) adjacent to the Consented Lethans Wind Farm. The Proposed Development is located within East Ayrshire approximately 9.5 kilometres (km) north-east of New Cumnock and approximately 9 km to the north-west of Sanquhar as shown in Drawing SR01. The Proposed Development will utilise the same access and grid connection as the Lethans Wind Farm and therefore constitutes a wind farm extension rather than a new wind farm application.
- 1.2 As part of the S36 application, deemed planning permission will be sought by the Scottish Ministers under section 57(2) of the Town and Country Planning (Scotland) Act 1997 as amended.
- 1.3 The S36 application will be accompanied by an Environmental Impact Assessment (EIA) and associated EIA Report undertaken in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 as amended (the EIA Regulations).
- 1.4 In line with EIA Regulations, a formal opinion of the information to be supplied in the Environmental Impact Assessment Report (EIA Report) is sought from Scottish Ministers.
- 1.5 The specific objectives of this Report are therefore to:
- Seek agreement on the likely significant effects associated with the Proposed Development;
 - Confirm that all likely significant effects have been correctly included in the proposed scope of the EIA ('scoped in');
 - Seek agreement where non-significant effects have been excluded ('matters scoped out'); and
 - Invite comment on the proposed approach to the EIA, including baseline data collection, prediction of environmental effects and the assessment of significance.
- 1.6 All topic assessments within the EIA Report will be undertaken using best practice methodology, following industry guidelines where appropriate and carried out by competent specialists with relevant professional experience.
- 1.7 Consultees will note that the Scoping Report contains a number of questions, which would be useful to receive feedback on. 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.

CONSENTED LETHANS WIND FARM AND PROPOSED EXTENSION

- 1.1 In March 2018 the Scottish Ministers granted the Applicant consent under S36 of the Electricity Act and deemed planning permission for the construction and operation of Lethans Wind Farm. In 2019, the Applicant submitted a second application for an alternative design to the wind farm and this was consented in 2020. All reference to the Consented Lethans Wind Farm within this Report refers to the 2020 consent as described in this section.
- 1.2 The Consented Lethans Wind Farm comprises 22 wind turbines with varying tip heights between 176 metres (m) and 220 m with a rotor diameter up to 150 m. This includes:
- Seven turbines with a maximum tip height of 176 m;
 - Ten turbines with a maximum tip height of 200 m; and
 - Five turbines with a maximum tip height of 220 m.
- 1.3 The Consented Lethans Wind Farm also includes:
- Associated turbine infrastructure (e.g. foundations, external transformers and crane hardstanding/set down areas);
 - Micrositing allowance of 50 m;
 - Construction of approximately 13 km of new access track and utilisation of approximately 6 km of existing track;
 - Underground cabling;
 - 11 new and 13 upgraded watercourse crossings;
 - A substation building;
 - One control building and associated temporary construction compound, with an additional control building and temporary construction compound required by Scottish Power (SPT);
 - Temporary construction compound;
 - Up to five borrow pits; and
 - A Concrete Batching Plant.
- 1.4 The Proposed Development is located adjacent to the north-east boundary of the Consented Lethans Wind Farm, as shown on Drawing SR03. As a starting point, the Scoping layout for the Proposed Development consists of a maximised layout of 11 turbines with a height of approximately 260 m to blade tip and a total generating capacity of around 66 MW. An indicative Proposed Development turbine layout is provided in Drawing SR02, and shown alongside the Consented Lethans Wind Farm in Drawing SR03. The Proposed Development will include ancillary infrastructure and may also include battery storage systems; further details are provided in Chapter 2 of this Report.

- 1.5 The Proposed Development will utilise the same access and grid connection as the Consented Lethans Wind Farm and therefore it constitutes a wind farm extension rather than a new wind farm application.

CONSULTATION

- 1.6 Banks Renewables' experience in the preparation and successful implementation of major development schemes and its knowledge of the locality has been used to define the extent of the study area and to identify the main environmental effects. Banks Renewables recognise that the involvement of third parties, including local interest groups and communities, is important in order to ensure the Proposed Development is formulated taking account of any relevant local circumstances, issues or opportunities for improvement.
- 1.7 On all of its sites Banks Renewables operate a 'Development with Care' approach. The phrase describes how Banks Renewables deals with people inside and outside the company and it is the guiding principle of the way we want to carry out our business at all times.
- 1.8 A fundamental part of this is to involve local communities and interested parties in the formulation and design process. A Community Liaison Manager is assigned to each project to work alongside the project team to create a Community Engagement Strategy for each project. Through open and honest dialogue, we can learn about local needs and provide tangible benefits for communities surrounding our proposals. Extensive consultation will be undertaken with local people, organisations and statutory bodies, including East Ayrshire Council (EAC), Dumfries and Galloway Council (D&GC), Historic Environment Scotland (HES), NatureScot¹ (NS) and Scottish Environmental Protection Agency (SEPA), prior to the design being finalised.

¹ Scottish Natural Heritage (SNH) rebranded in August 2020 as NatureScot. Where relevant reference is still made to SNH within this Report in respect of guidance which remains valid and is yet to be republished etc.

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2. THE SITE AND PROPOSED DEVELOPMENT

SITE CONTEXT

- 2.1 The Site is located approximately 9.5 km north-east of New Cumnock and approximately 9 km to the north-west of Sanquhar and is comprised completely of forestry in various states of felling and regrowth. The indicative Site boundary is shown on Drawing SR01. The Site is approximately 370 hectares (ha) and located entirely within East Ayrshire Council (EAC), centred on National Grid Reference (NGR) 271920, 618215. Dumfries and Galloway Council (D&GC) boundary runs along the southern edge of the Site.
- 2.2 The geology of the Site consists predominantly of till with areas of peat, rock outcrops and several minor watercourses present. There are some areas of slope over 14% which are primarily located around Auchtitench Hill, Earl Hill and Dennigall Hill, all of which are within the Site boundary as shown on Drawing SR02.
- 2.3 Two Sites of Special Scientific Interest (SSSIs) are adjacent to the Site boundary with Muirkirk Uplands to the north and North Lowther Uplands to the south; these are also classed as Special Protection Areas (SPAs). Muirkirk Uplands is designated for blanket bog, breeding bird assemblage, hen harrier (breeding and non-breeding), short-eared owl breeding, geological deposits of Silurian-devonian chordata, and upland habitat assemblage. North Lowther Uplands is designated for breeding bird assemblage hen harrier breeding and non-breeding, golden plover breeding, merlin breeding, geology and upland habitat assemblage.
- 2.4 The nearest main settlement is Kirkconnel and Kelloholm located, approximately 5 km and 6 km to the south of the Site, respectively. Access to the Site would be via the A76 which lies approximately 9 km south-west of the Site boundary. The B740 lies approximately 7 km east from the Site boundary. The nearest core path to the Site is the B17: Old Drove Road which is a part of the East Ayrshire Core Path Network, it is approximately 1.5 km north of the Site boundary. The Kirkconnel To Black Law (Via Fingland & Kirkland) core path is approximately 1.7 km to the east of the Site boundary.
- 2.5 There are a number of operational and consented wind farms within 20 km as shown in Drawing SR06. The closest are the Consented Lethans Wind Farm and Glenmuckloch Wind Farm to the south and the Kennoxhead Wind Farm cluster to the north.
- 2.6 The Consented Lethans Wind Farm, referenced in Chapter 1 of this Report, is adjacent to the south-western boundary of the Site. The consented Glenmuckloch Wind Farm lies adjacent to the southern boundary of the Consented Lethans Wind Farm and consists of eight turbines with a tip height of up to 149.9 m.
- 2.7 The Kennoxhead Wind Farm cluster lies approximately 3 km to the north and consists of the Consented Kennoxhead Wind Farm, Kennoxhead Extension, and Penbreck Wind Farm comprising 36 turbines.

PROPOSED DEVELOPMENT

- 2.1 The Scoping turbine layout shown in Drawings SR02 and SR03 is a maximised layout of 11 turbines, based on tip heights of 260 m with an operating capacity of around 66 MW.
- 2.2 The number, hub and tip height and position of individual turbines would be dependent upon a number of factors including technical and environmental constraints. The results obtained during the EIA process will be used in an iterative manner to influence the design of the Proposed Development to ensure that any significant detrimental environmental impacts are minimised where possible or negated completely. The EIA Report will include a design iteration section which will outline the design process including alternative layouts that were considered.
- 2.3 A range of turbine layouts will be assessed; both in terms of environmental impacts and economic viability. Selection of the final turbine model will require a balance to be reached between acceptable environmental impacts including visual cohesion with the Consented Lethans Wind Farm and optimising the energy yield from the Proposed Development.
- 2.4 Ancillary infrastructure will also be required as part of the Proposed Development and will include crane hardstandings, extension to the consented access track, transformers and underground cables. Key hole felling of forestry would also be required. A new substation will be required for the Proposed Development which will tie into the SP Energy Network substation within the Consented Lethans Wind Farm. The Proposed Development may also include battery storage systems.
- 2.5 Given the iterative nature of the EIA process, the layout of the Proposed Development is still being refined, and this will continue throughout the EIA process until all baseline surveys are completed. The Proposed Development is therefore being scoped on a preliminary turbine layout as shown in Drawing SR02. The layout with the Consented Lethans Wind Farm is shown in Drawing SR03. The results of the Scoping process will feed into the iterative design of the Proposed Development.
- 2.6 The below sections provide an overview of the elements considered likely to be included in the final design of the Proposed Development.

Turbines

- 2.7 A candidate turbine manufacturer and model will be selected during the design and EIA process following assessment of a range of turbines; however, for the purposes of scoping, indicative turbine details are provided below:
 - Approximate number of turbines: 11
 - Maximum height to blade tip: 260 m
 - Generating capacity (per turbine): approximately 6 MW
 - Total generation capacity: approximately 66 MW
- 2.8 An indicative Site Layout is shown in Drawing SR02. For the purposes of the EIA, a precautionary approach will be taken and, for each assessment, a worst-case scenario will be identified within the design parameters. This allows a conservative scenario to be evaluated.

Access

- 2.9 The turbines would be delivered to a nearby port facility capable of handling them. The turbine components would then be delivered to the Site, from the east, using the existing road network (M77/A76).
- 2.10 The EIA will include an assessment of the local road network and identify the most likely route to Site for both the abnormal loads and other construction, as outlined in Chapter 5 of this Report.

On-Site Access Tracks

- 2.11 The Consented Lethans Wind Farm tracks would be used to access the Site. New access tracks will be required between the proposed turbines and connecting these to the Consented Lethans Wind Farm track network. New tracks will be constructed of a graded stone and be approximately 5 to 6 m in width, or as appropriate for the ground conditions.

Electrical Infrastructure

- 2.12 Onsite underground cabling will be laid alongside the access tracks where possible, linking the turbine transformers to a new substation. The design of the new substation will likely take the form of a single storey building housing the electrical infrastructure, although certain elements may be externally located within a fenced compound.
- 2.13 Depending on the turbine model, the transformer may either be inside or outside the turbine. The EIA will assume and assess outside transformers. Onsite underground cabling will be laid alongside the access tracks, where possible, linking the turbine transformers to the onsite substation.
- 2.14 The Proposed Development will utilise the same SP Energy Network grid connection as the Consented Lethans Wind Farm.

Battery Storage Systems

- 2.15 Battery storage systems, may be included as part of the Proposed Development. Such systems are designed to complement renewable energy generation. In terms of appearance, the system would be comparable to the onsite substation.

Temporary Construction Compound

- 2.16 A temporary construction compound will be required during the construction of the Proposed Development, forming an area of hardstanding providing space for temporary welfare, parking, lay down areas and potentially concrete batching. The location of the temporary construction compound may use the same area as the Consented Lethans Wind Farm, or another area suitable for hardstanding, for construction of the Proposed Development.

Meteorological Mast

- 2.17 A meteorological mast may be required as part of the Proposed Development. If a meteorological mast is required, it will be of a height similar to that of the hub height of the proposed turbines. Alternatively, the Consented Lethans Wind Farm includes one meteorological mast, which may be used for the Proposed Development.

Decommissioning

- 2.18 The Development will be designed to operate for a period of 30 years. Provision will be made for the installation to be decommissioned concurrently with the Consented Lethans Wind Farm, and the Site restored at the expiry of the S36. Typically, all equipment above ground level will be dismantled and removed from the site, cables and the turbine foundations will be cut off below ground level and covered with topsoil. Access tracks will be left for use by the landowners, or if appropriate, covered with topsoil. Alternatively, the Applicant may apply for permission to extend the operational life of the wind farm and this application would be submitted in accordance with the relevant planning and environmental impact legislation and regulations at the time of any such application.
- 2.19 For the purposes of this exercise, it has been assumed that the Proposed Development will be decommissioned, as repowering will involve an additional application for planning permission and a further EIA.

DEVELOPMENT PHASES

- 2.20 It is expectant that the construction phase of the Development will take approximately 30 months, depending on the final design. This period is weather dependant and could be affected by onsite conditions. It is envisaged that the construction programme would follow this broad outline:
- Felling of Forestry;
 - Erection of temporary construction compound;
 - Construction of access tracks extensions and hardstanding areas;
 - Excavation and construction of turbine foundations;
 - Excavation of cable trenches and the laying of cables;
 - Erection and commissioning of turbines; and
 - Reinstatement of land and removal of temporary construction compound.

3. POLICY CONTEXT

- 3.1 The S36 application to the Scottish Government will be accompanied by a Planning Statement in support of the Proposed Development. The Planning Statement will consider the Proposed Development against identified planning and other policy objectives, concluding with substantiated comments about the extent to which the Proposed Development complies with the aims and objectives of identified plans and policies.
- 3.2 This section of the report identifies the key policy documents of relevance to the Proposed Development which will be considered throughout the preparation of the EIA Report, including key planning guidance, renewable energy policy and other material planning considerations.

UK ENERGY POLICY

- 3.3 The following documents set out the UK Governments binding commitments to cut carbon emissions through the deployment of renewable energy:
- The Climate Change Act 2008;
 - The UK Renewable Energy Strategy (2009);
 - The UK Renewable Energy Roadmap (2011) (updated 2012 and 2013); and
 - The National Policy Statement for Renewable Energy Infrastructure (EN-3) (2011).
- 3.4 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 clear objectives of the UK and Scottish Governments will be summarised, in relation to encouraging increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.
- 3.5 The Proposed Development would clearly make a contribution to the attainment of renewable energy and electricity targets at both the Scottish and UK levels, and this would be quantified and described. The description of the renewable energy policy framework will also make reference to the Scottish Government's Climate Change Plan, Energy Strategy and Onshore Wind Policy Statement.

NATIONAL PLANNING POLICY

- 3.6 Reference will be made to various national planning policy and guidance documents including:
- The National Planning Policy Framework 3 (NPF3);
 - Scottish Planning Policy (SPP); and
 - Scottish Government web-based Renewables Guidance and relevant Planning Advice Notes.

- 3.7 NPF3 (2014) is the spatial expression of the Scottish Government's Economic Strategy with plans for development and investment in infrastructure. Part of the vision is to make Scotland a low carbon place, where the opportunities arising from the ambition to be a world leader in low carbon energy generation have been seized. NPF3 is informed by, and aims to help achieve, the Scottish Government's climate change and renewable energy targets.
- 3.8 NPF3 acknowledges that the energy sector accounts for a significant share of the country's greenhouse gas emissions, and that addressing this requires capitalising on Scotland's outstanding natural advantages, including its significant wind resource. NPF3 makes it clear that onshore wind will continue to play a significant role in decarbonising the energy sector and diversifying energy supply.
- 3.9 The Scottish Government released a position statement in November 2020 in regards to NPF4 highlighting their commitment to address climate change and reduce carbon, and it is anticipated that a draft NPF4 may be issued for consultation purposes in 2021. Reference to these documents will also be included, where relevant.
- 3.10 SPP (most recent revision December 2020) sets out national planning policies which reflect Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. The SPP contains the policies which are applied to the authorisation of onshore renewable electricity generation schemes under Section 36 of the Electricity Act 1989.

LOCAL DEVELOPMENT PLAN

- 3.11 In the case of S36 Applications, the Local Development Plan (LDP) does not have a primacy of the decision making. Nonetheless, it forms the basis of the statutory consultation response from the host Local Planning Authority, EAC. As such, the East Ayrshire Council Local Development Plan (EALDP) 2017 forms a material consideration. Therefore, regard will be given to the relevant policies contained within the LDP and supplementary guidance, most notably Planning for Wind Energy (December 2017).
- 3.12 The most significant policy within the EALDP for the determination of the Proposed Development is Policy RE3: Wind Energy Proposals over 50 Metres in Height; therefore the assessment of the Proposed Development's compliance with this Policy is of importance when determining this Application.
- 3.13 The Proposed Development would be further guided by other EALDP policies including OP1, RE1, T4 and relevant environmental policies (Env1-12).
- 3.14 Due to the proximity of the Proposed Development to the boundary with Dumfries and Galloway Council, consideration will also be given to relevant policies within the Dumfries and Galloway LDP2 (October 2019) including IN1, IN2 and relevant natural environment policies (NE1-15).

4. APPROACH TO EIA

OVERVIEW

- 4.1 Environmental Impact Assessment (EIA) is an iterative assessment process with the aim of avoiding or reducing the potential effects resulting from developments through the continual refinement of its design. These effects can occur throughout all phases of the Proposed Development from construction, through operation and during decommissioning. Any potential effects will be mitigated utilising the mitigation hierarchy of avoid, reduce, offset and compensate.

PROPOSED SCOPE OF THE EIA

- 4.2 The results of the EIA will be presented in an EIA Report which, as prescribed in the EIA Regulations, is required to include a “description of the likely significant effects” of the Proposed Development. Likewise, effects which are not considered to be significant do not need to be described, and these are detailed in the Matters Scoped Out sections within Chapter 5 of this Report.
- 4.3 The main steps of the EIA process are broadly summarised as follows:
- Scoping [current stage]: The Scoping Opinion from ECU will be used to inform and focus the scope of the EIA on likely significant effects that could be anticipated to occur as a result of the Proposed Development;
 - Baseline studies [completed; current stage]: Desk-based assessment, baseline surveys and site visits in order to determine the baseline conditions of the environment and area that may be affected by the Proposed Development;
 - Predicting and assessing effects: Potential interactions between the Proposed Development and the baseline conditions will be considered. The nature of the effects, e.g. direct or indirect; positive or negative; long, medium or short term; temporary or permanent, will be predicted and assessed. Potential cumulative effects arising from Proposed Development in conjunction with other proposed or consented developments will also be considered;
 - Mitigation and assessment of residual effects: Potential effects will be avoided or reduced wherever possible through embedded mitigation. Where this is not possible, operational mitigation or other measures to reduce and/or offset significant effects will be proposed. The residual effects will then be assessed to determine any effects predicted to remain following implementation of the recommended mitigation measures; and
 - Production of the EIA Report: The results of the EIA will be set out in the EIA Report.

ASSESSMENT METHODOLOGY

- 4.4 In order to assess the potential effects arising from the Proposed Development, the significance of identified effects will be determined. The determination of significance relates to the sensitivity of the resource or receptor being affected and the magnitude of change as a result of the effect. The assessment of effects will combine professional judgement together with consideration of the following:

- The sensitivity of the resource or receptor under consideration;
 - The magnitude of the potential effect in relation to the degree of change which occurs as a result of the Proposed Development;
 - The type of effect, i.e. adverse, beneficial, neutral or uncertain;
 - The probability of the effect occurring, i.e. certain, likely or unlikely; and
 - Whether the effect is temporary, permanent and/or reversible.
- 4.5 Each individual technical area will detail their specific assessment methodology in the relevant chapters of the EIA Report.
- 4.6 Where the EIA identifies likely significant adverse environmental effects, mitigation measures will be proposed in order to avoid, reduce, offset or compensate those effects. These mitigation measures may be embedded in the design or compensatory. Such embedded mitigation measures will likely include the movement or loss of turbines, access tracks and other infrastructure; and management and operational measures.
- 4.7 In line with the mitigation hierarchy identified in Planning Advice Note (PAN) 1/2013, Revision 1.0 (2017), the strategy of avoidance, reduction, offsetting and compensation seeks:
- First to avoid significant adverse effects;
 - Then to minimise those which remain; and
 - Lastly, where no other remediation measures are possible, to propose appropriate compensation.
- 4.8 In addition, enhancement measures may be incorporated into design of the Proposed Development to maximise environmental benefits.
- 4.9 Although PAN 1/2013 Revision 1.0 (2017) refers to Town and Country Planning, as opposed to S36 applications, the guidance outlined remains applicable here. The residual effects will then be assessed to determine any effects predicted to remain following implementation of the recommended mitigation measures.

CUMULATIVE EFFECTS

- 4.10 There are a number of operational wind farms and proposed wind farm developments in the vicinity of the Site as shown on Drawing SR06. Cumulative effects will be considered for each technical area assessed within the EIA and include two forms:
- Combined effects of two or more similar developments; and
 - Synergistic effects with the Proposed Development.
- 4.11 The extent of the cumulative assessment relative to each technical assessment is defined in the relevant technical areas within Chapter 5 of this Report. For example, the potential landscape and visual effects, which relate to the visibility of the Proposed Development, will be much more wide-ranging than noise effects, which will be limited to receptors in the more immediate vicinity of the Proposed Development. Specific

guidance and policy exist for certain technical areas which advise how effects should be considered cumulatively and these will be used where relevant.

CONSIDERATION OF REASONABLE ALTERNATIVES

- 4.12 Schedule 4, Part 2 of the EIA Regulations requires an outline of the reasonable alternatives (such as technology, location, size and scale) considered and the main reasons why the Proposed Development was chosen, taking into account the environmental effects. Details of this will be provided within the EIA Report.
- 4.13 Consideration of alternative designs has already begun. The final layout of the Proposed Development will be based on a range of technical criteria, such as separation distances between turbines, wind speed, prevailing wind direction, existing infrastructure, topography, ground conditions, local environmental issues and landscape and visual considerations. The identification of these criteria is an iterative process: as they are identified the layout of the Proposed Development, including ancillary infrastructure, will undergo a series of modifications to avoid or reduce potential effects through careful design. This process will be set out in the EIA Report.

ENVIRONMENTAL DESIGN AND MANAGEMENT MEASURES

- 4.14 Throughout the EIA Report, where applicable, the way that potential environmental effects have been or will be avoided, prevented, reduced or offset through design and / or management measures will be described. These are measures that are inherent in the design and construction of the Proposed Development and, for example, include measures such as the production and implementation of measures contained within a Construction Environmental Management Plan (CEMP). Proposed environmental enhancements to be implemented as part of the Proposed Development will also be described, where applicable.
- 4.15 These design measures will be considered prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic in practice, i.e. do not take account of such measures even though they are likely to be standard practice. These will then be followed through the assessment to ensure that realistic environmental effects are identified.

THE EIA REPORT

- 4.16 The EIA process will result in the production of an EIA Report. It will focus on each of the broad topics identified within this Scoping Report, plus any others that develop throughout the remainder of the EIA process until submission.
- 4.17 Where features are considered, the assessment methodology, results, effects and mitigation proposed (if any) will be included. This will allow for the residual effect from the Proposed Development to be identified to allow the ECU sufficient information to determine the application. Further details of the structure of the EIA Report are provided in Chapter 6 of this Report.

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5. PROPOSED SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

- 5.1 The following sections set out the proposed approach to the topics that may give rise to likely significant environmental effects and therefore form the proposed scope of the Lethans Wind Farm Extension EIA.

LANDSCAPE AND VISUAL

Introduction

- 5.2 It is acknowledged from the outset that, in common with almost all commercial wind energy developments, some landscape and visual effects would occur as a result of the proposals, including some significant effects.
- 5.3 A key principle of the European Landscape Convention is that all landscapes matter and should be managed appropriately. It is also acknowledged that landscapes provide the surroundings for people's daily lives and often contribute positively to the quality of life and economic performance of an area.
- 5.4 It is therefore proposed that a Landscape and Visual Impact Assessment (LVIA) is undertaken as part of the EIA and an LVIA chapter included in the EIA Report. The LVIA will be undertaken by Chartered Landscape Architects, who are experienced in the assessment of large scale, onshore wind energy projects and are fully familiar with the landscape in and around this part of East Ayrshire.
- 5.5 It is proposed that the LVIA will consider the potential effects of the Proposed Development upon:
- Individual landscape features and elements;
 - Landscape character; and
 - Visual amenity and the people who view the landscape.

Environmental Baseline and Potential Sources of Impact

- 5.6 The proposed Lethans Extension adjoins the north-east edge of the Consented Lethans Wind Farm that was granted consent in June 2020. The Site is located approximately 9.5 km north-east of New Cumnock and approximately 9 km to the north-west of Sanquhar, in rural East Ayrshire, adjacent to the boundary with Dumfries and Galloway. The Proposed Development is situated within commercial forest plantation, within an undulating, upland landscape above Nithsdale and comprises open moorland to the north-west and east and further coniferous plantation extending to the north-east.

Landscape Character

- 5.7 NatureScot² published an updated national set of Landscape Character Types (LCTs) in early 2019. This 2019 national LCT map and associated LCT Descriptions

² Scottish Natural Heritage (SNH) rebranded in August 2020 as NatureScot. Where relevant reference is still made to SNH within this chapter in respect of guidance which remains valid and is yet to be republished etc.

now supersede the earlier 1990s SNH landscape character descriptions and mapping.

5.8 The Site lies within LCT 78 'Plateau Moorland – Ayrshire and adjacent to the boundary of LCT 178 Southern Uplands with Forest – Dumfries & Galloway.

5.9 The key characteristics of LCT 78 Plateau Moorland – Ayrshire are defined by NatureScot as follows:

- Topography is comparatively level with extensive plateaux rising to soft contoured ridges;
- Underlain by basalts to the east and greywackes to the south-west;
- Covered by blanket bog, heather and grass moorland, with extensive mosses and peatland forming an important component of this landscape type;
- Frequent extensive areas of coniferous forest of uniform age which, in places, have significantly modified the original character of these areas in terms of colour, texture and views;
- Largely undeveloped with a sparse network of roads;
- Wind farm development on the north-eastern margins;
- Open, exposed and rather remote landscape, wild in character, although this is lessened in places by the presence of wind turbines and associated infrastructure; and
- Views are open and medium to longer distance depending on undulations in the local topography.

5.10 The key characteristics of LCT 178 Southern Uplands with Forest – Dumfries & Galloway are defined by NatureScot as follows:

- Large, smooth dome-shaped hills with large scale dark green forests on slopes and over lower summits;
- Predominantly simple, gently rolling landform;
- Some areas of more complex and smaller-scale landscapes, with steep slopes enclosing heads of valleys and/or where uplands remain open;
- Changing landscapes with large scale forestry operations and wind farm development;
- Forested areas dominated by Sitka Spruce, interspersed with mixed conifers and broadleaf planting, and undergoing felling and replanting in large coupes;
- Wind farms are a key characteristic in some areas; and
- Expansive scale.

- 5.11 However, in introducing the updated National Landscape Character Assessment, NatureScot set out that where there are 'topic specific landscape capacity or sensitivity studies, they would take precedence for informing that development type'.
- 5.12 The East Ayrshire Landscape Wind Capacity Study 2018 updates the earlier landscape wind capacity study and considers the landscape and visual sensitivity of the 12 landscape character types in East Ayrshire to wind energy development. Therefore, it is proposed to focus the assessment of effects on landscape character on this study and not the national level assessment. Likewise, the Dumfries & Galloway Landscape Capacity Study (2017), the South Lanarkshire Landscape Capacity Study for Wind Energy (2016) and the South Ayrshire Landscape Wind Capacity Study (2018) will be used as the basis for assessment.
- 5.13 The LVIA will include an assessment of the sensitivity of the character of the LCTs within the Study Area, before going on to provide an assessment of the potential for the Proposed Development to result in significant effects on the character of each.

Landscape Designations

- 5.14 The Proposed Development is not located within a nationally or locally designated landscape. The internationally designated New Lanark World Heritage Site is located approximately 26.8 km to the north-northeast of the Site.
- 5.15 The locally designated Southern Uplands Sensitive Landscape Character Area (SLCA) is situated to the west of the Site. The SLCA extends from the southern boundary of East Ayrshire at Blackcraig Hill north to Muirkirk and covers an area over the central part of East Ayrshire from Hillhead through to the eastern boundary with South Lanarkshire at Auchengilloch and Blackside.
- 5.16 The nearest Garden and Designed Landscape is Dumfries House, located approximately 14.6 km to the west, beyond Cumnock.
- 5.17 The Site also lies outwith Wild Land, with the nearest areas, Area 1 Merrick and Area 2: Talla-Hart Fell, both lying around 35 km to the south-west and east respectively.
- 5.18 Landscape designations in the vicinity of the Site are illustrated on Drawing SR04.

Potential Sources of Impacts

- 5.19 In addition to the wind turbines and their associated visible aviation lighting, ancillary elements such as crane hardstandings, access tracks, underground cables, energy storage apparatus, a proposed electricity substation and two anemometers have the potential to result in effects.
- 5.20 These elements will be considered throughout the LVIA where necessary.

Consultation

- 5.21 Consultation with statutory authorities has not been undertaken prior to preparing this scoping chapter. However, the methodology and scope presented in this section has been guided by previous experience of working on the LVIA of the Consented Lethans Wind Farm and experience of working on numerous similar scale schemes in the general locality.

Method of Assessment and Reporting

Guidance and Legislation

- 5.22 The LVIA shall be undertaken in accordance with the principles of best practice, as outlined in published guidance documents, notably the third edition of the Guidelines for Landscape and Visual Impact Assessment (GLVIA3), (Landscape Institute and the Institute for Environmental Management and Assessment, 2013)³.
- 5.23 The methodology and assessment criteria proposed for the assessment has been developed in accordance with the principles established in this best practice document. It should be acknowledged that GLVIA3 establishes guidelines, not a specific methodology. The preface to GLVIA3 states:
- “This edition concentrates on principles and processes. It does not provide a detailed or formulaic ‘recipe’ that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand.”*
- 5.24 The approach has therefore been developed specifically for this assessment to ensure that the methodology is fit for purpose.
- 5.25 As part of the development of the proposed methodology, consideration has also been given to the following documents:
- General pre-application and scoping advice for onshore wind farms. Guidance. NatureScot (September 2020)⁴;
 - Guidelines for Landscape Character Assessment, Countryside Agency and SNH (2002)⁵;
 - Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, March 2012)⁶;
 - Siting and Design of Wind farms in the Landscape, Version 3a (SNH, August 2017)⁷;

3 Landscape Institute for Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment. Third Edition.

4 NatureScot (2020). General pre-application and scoping advice to developers of onshore wind farms [Online] Available at: <https://www.nature.scot/general-pre-application-and-scoping-advice-onshore-wind-farms> (Accessed 15/12/20)

5 Scottish Natural Heritage and The Countryside Agency (2002). Landscape Character Assessment. Guidance for England and Scotland [Online] Available at: <https://www.nature.scot/sites/default/files/2018-02/Publication%202002%20-%20Landscape%20Character%20Assessment%20guidance%20for%20England%20and%20Scotland.pdf> (Accessed 15/12/20)

6 Scottish Natural Heritage (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments [Online] Available at: <https://www.nature.scot/guidance-assessing-cumulative-impact-onshore-wind-energy-developments> (Accessed 15/12/20)

7 Scottish Natural Heritage (2017). Siting and Design of Wind farms in the Landscape, Version 3a [Online] Available at: <https://www.nature.scot/siting-and-designing-wind-farms-landscape-version-3a> (Accessed 15/12/20)

- Visual Representation of Wind farms – Version 2.2 (SNH, February 2017)⁸;
 - Landscape Institute (LI) Technical Guidance Note 06/19 Visual representation of development proposals (Landscape Institute, September 2017)⁹;
 - LI Technical Guidance Note 02/19 Residential Visual Amenity Assessment (RVAA), (Landscape Institute, March 2019)¹⁰; and
- 5.26 The LVIA will include an assessment of the sensitivity of the character of the LCTs within the Study Area, before going on to provide an assessment of the potential for the Proposed Development to result in significant effects on the character of each.
- 5.27 Full details of the methodology will be provided within an appendix to the LVIA chapter of the EIA Report.

Proposed Scope of Assessment

- 5.28 It is proposed that the main objectives of the LVIA will be as follows:
- to identify, evaluate and describe the current landscape character of the Site and its surroundings, and also any notable individual or groups of landscape features within the Site;
 - to determine the sensitivity of the landscape to the type of development proposed;
 - to identify potential visual receptors (i.e. people that would be able to see the Proposed Development) and evaluate their sensitivity to the type of changes proposed;
 - to identify and describe any impacts of the Proposed Development in so far as they affect the landscape and/or views of it and evaluate the magnitude of change due to these impacts;
 - to identify and describe any mitigation measures (including mitigation which is inherent in the design and layout of the Proposed Development) that have been adopted to avoid, reduce and compensate for landscape and visual effects;
 - to identify and assess any cumulative landscape and visual effects;
 - to evaluate the level of residual landscape and visual effects; and
 - to make a professional judgement about which effects, if any, are significant.

8 Scottish Natural Heritage (2017). Visual Representation of Wind farms. Guidance Version 2.2 [Online] Available at: <https://www.nature.scot/visual-representation-wind-farms-guidance> (Accessed 15/12/20)

9 Landscape Institute (2019). Visual Representation of Development Proposals. Technical Guidance Note 06/19 [Online] Available at: <https://www.landscapeinstitute.org/visualisation/> (Accessed 15/12/20)

10 Landscape Institute (2019). Residential Visual Amenity Assessment (RVAA). Technical Guidance Note 02/19 [Online] Available at: <https://www.landscapeinstitute.org/technical-resource/rvaa/> (Accessed 15/12/20)

Distinction between Landscape and Visual Effects

5.29 In accordance with the published guidance, landscape and visual effects shall be assessed separately, although the procedure for assessing each of these is closely linked. A clear distinction has been drawn between landscape and visual effects as described below:

- Landscape effects relate to the effects of the Proposed Development on the physical and perceptual characteristics of the landscape and its resulting character and quality; and
- Visual effects relate to the effects on specific views experienced by visual receptors and on visual amenity more generally.

Types of Effects Considered

5.30 It is proposed that the LVIA will consider the potential effects of the Proposed Development upon:

- individual landscape features and elements;
- landscape character; and
- visual amenity and the people who view the landscape.

5.31 The LVIA will consider the effects at three different stages in the lifetime of the Proposed Development:

- during construction of the Proposed Development;
- during the operational lifetime of the Proposed Development; and
- during decommissioning of the Proposed Development.

5.32 Effects during the first and third of these phases are considered to be temporary and would have a short duration. Effects associated with the operational phase of the Proposed Development are considered to be long term, reversible effects.

5.33 Following the judgement of the sensitivity of the landscape or visual receptor, the LVIA will provide a judgement as to the magnitude of change and the level of the effect experienced by each receptor, along with a statement to clarify whether the additional effect resulting from the Proposed Development is significant or not.

5.34 A further judgement will also be made about the combined effect of the Proposed Development and the Consented Development and whether the additional effect resulting from the Proposed Development changes results in any new significant effects. This will assist in considering the totality of the effect of the Consented Lethans Wind Farm and the Proposed Development.

Study Area

5.35 In order to assist with defining the Study Area, a digital Zone of Theoretical Visibility (ZTV) model was created as a starting point to illustrate the geographical area within which views of development on the Site are theoretically possible.

- 5.36 This was based on a 'bare-earth' scenario, whereby the screening effect of areas of existing vegetation or built features in the landscape are not taken into account. The ZTV was modelled to blade tip height using the currently proposed maximum turbine blade tip height of 260 m and is presented at Drawing SR05.
- 5.37 Having reviewed the ZTV, it is proposed that the LVIA will consider an initial 35 km radius Study Area. Detailed assessment will then be provided for a 20 km radius Study Area, which it is considered represents a proportionate extent of the Study Area and the limit within which any potential significant effects might occur.
- 5.38 As the Proposed Development represents an extension to the consented Lethans Wind Farm, a comparative ZTV between the Proposed Development and the consented scheme has been undertaken and is presented at Drawing SR06.
- 5.39 For the cumulative assessment, consideration was initially given to a 60 km radius from the Site, as recommended by NatureScot best practice guidance. Following this review, it is proposed that a 20 km detailed Study Area be adopted to consider cumulative effects, which is considered represents a proportionate extent of the Study Area and the limit within which any potential significant cumulative effects might occur. Cumulative sites within 20 km of the Site are illustrated on Drawing SR06.

Visual Receptors

- 5.40 A detailed consideration of the potential for effects to the visual amenity of receptors in the landscape surrounding the Site will be set out in the LVIA. This visual assessment will be informed by a selection of representative assessment viewpoints, which are listed below, each of which will be illustrated with visualisations prepared in line with NatureScot best practice guidance.
- 5.41 Typically, a detailed consideration with regard to the visual amenity of the nearest residential properties to the Site is given within in the LVIA (excluding those with a financial involvement in the project from detailed assessment). However, as there are no residential properties located within 2 km of the Proposed Development, a separate standalone Residential Visual Amenity Study (RVAS) will not be prepared as part of the LVIA.
- 5.42 Therefore, the LVIA will focus on the potential effects of the Proposed Development on different receptor groups, comprising settlements, footpath users, recognised tourist routes, long distance walking routes, cycle routes and centres for tourism.

Proposed LVIA Viewpoint Locations

- 5.43 It is proposed that the 16 locations set out in Table 5.1 are included as viewpoints in the LVIA. The locations which are illustrated on Drawing SR05 represent visual receptors and character types at a range of distances and directions from the Site.
- 5.44 It is acknowledged that the Proposed Development is located adjacent to the north-eastern edge of the consented Lethans Wind Farm, which has influenced the choice of viewpoint locations.

Table 5.1: Lethans Extension Proposed Viewpoint Locations

Lethans Extension Viewpoint Number	Location	OS Grid Reference	Consented Lethans Wind Farm Viewpoint Number
VP1	B743 (east of Nethersfield)	258726, 626946	VP4
VP2	B705 (Auchlinleck)	255098, 622594	VP5
VP3	A70 (north-east of Cumnock)	257658, 620301	VP7
VP4	Glenmuir Water Road	260658, 620251	VP11
VP5	Kyle Castle	264729, 619208	VP15
VP6	Boig Road / Glaisnock Road Junction (Core Path)	258132, 615524	VP10
VP7	A76 New Cumnock	262607, 613121	-
VP8	Blackcraig Hill	264734, 606459	VP25
VP9	A76 (west of Rigg Farm)	270604, 612204	VP18
VP10	Librymoor plantation (New Cumnock Path Network)	271748, 611473	VP20
VP11	A76 Kirkconnel	272285, 612455	-
VP12	Todholes Hill	274504, 615001	VP23
VP13	Cairn Kinney	278468, 621429	-
VP14	Cairn Table Hill	272428, 624228	VP24
VP15	A76 (between Kirkconnel & Sanquhar)	275858, 611381	VP21
VP16	Whing Head (Southern Upland Way)	275094, 605650	VP26

- 5.45 The proposed viewpoint locations are located at a range of distances and directions from the Proposed Development, are at varying elevations and cover a variety of different character areas and types. Some of the viewpoints are intended to be representative of the visual experience in a general location whereas other viewpoints illustrate the view from a specific or important vantage point. The viewpoints are also considered to respond to the guidance contained in Section 3.1 of the East Ayrshire's LDP Supplementary Guidance: Planning for Wind Energy (December 2017).
- 5.46 Each of the representative viewpoints will be visited to evaluate the sensitivity of views. In addition, the Study Area will also be extensively visited to consider visibility of the Proposed Development as receptors move through the landscape.
- 5.47 The viewpoints will be used as the basis for determining the effects on visual receptors within the Study Area. The sensitivity of different receptor groups will be set out in the LVIA methodology.
- 5.48 The level of effect experienced by different visual receptor groups will be determined by considering in tandem the sensitivity and view with the magnitude of impact.

Visualisations

- 5.50 For each of the above viewpoints, visualisations will be prepared in line with the Visual Representation of Wind farms – Version 2.2 (SNH, February 2017)¹¹.

Assessment of Turbine Lighting

- 5.51 The Proposed Development will incorporate turbines greater than 150 m, which under Civil Aviation Authority (CAA) Regulations¹² will require to be lit with visible aviation lighting. A 2000 candela steady state red aviation light will be required on the nacelle and three 32 candela steady state red aviation lights on the towers indicating half the nacelle height on all turbines greater than 150 m.
- 5.52 It is recognised that in some circumstances, it may be possible for turbine lighting to result in a significant effect on the character of the surrounding landscape. For example, if the proposed wind energy development is located within or in close proximity to a designated dark sky area, or is remote from existing sources of visible lighting, such as residential areas, commercial or industrial sites, or major roads.
- 5.53 For wind energy developments which are not located in such areas, it is considered that there would be no potential for significant effects on landscape character to arise from visible turbine lighting of the type proposed. This is because in these areas the character of the landscape during low natural light levels is already in part characterised by the presence of artificial lighting. Therefore, the addition of visible turbine lighting would not have the potential to bring about a fundamental change to the characteristics of the landscape.
- 5.54 The proposed wind farm lies away from recognised dark sky areas, with the Galloway International Dark Sky Park situated over 25 km to the south-west of the Proposed Development, with the Consented Lethans Wind Farm situated to the south-west of the Proposed Development and closer to the park. As such effects on it are proposed to be scoped out of the assessment.
- 5.55 The surrounding landscape context around the Proposed Development contains some existing sources of artificial light, particularly within surrounding settlements, industrial developments and along highways. Therefore, the assessment of turbine lighting will focus solely on the additional visual effects introduced by the lights.
- 5.56 In accordance with the recently published “General pre-application and scoping advice for onshore wind farms” (NatureScot September 2020)¹³, the LVIA will assess the additional visual effects of the aviation lighting in the main body of the LVIA chapter. The additional change introduced by the aviation lighting will form a component of the magnitude of change.

11 Scottish Natural Heritage (2017). Visual Representation of Wind farms. Guidance Version 2.2 [Online]

Available at: <https://www.nature.scot/visual-representation-wind-farms-guidance>

(Accessed 15/12/20)

12 Civil Aviation Authority (2017). Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level. [Online]

Available at: http://publicapps.caa.co.uk/docs/33/DAP01062017_LightingWindTurbinesOnshoreAbove150mAGL.pdf

(Accessed 15/12/20)

13 NatureScot (2020). General pre-application and scoping advice to developers of onshore wind farms [Online] Available at:

<https://www.nature.scot/general-pre-application-and-scoping-advice-onshore-wind-farms>

(Accessed 15/12/20)

- 5.57 This consideration will be informed by a ZTV of the lit turbines and night-time visualisations from a selection of viewpoints, illustrating the proposed lighting effects. In line with NatureScot Visualisation Guidance, the viewpoints selected represent locations from where people are most likely to experience the wind farm at night.
- 5.58 It is proposed that the following night-time visualisations will be produced:
- a) VP4 – Glenmuir Water Road;
 - b) VP7 – A76 New Cumnock; and
 - c) VP9 – A76 (west of Rigg Farm).
- 5.59 The viewpoints will be used as a starting point to inform consideration of the potential visual effects on key visual receptors in settlements (New Cumnock, Kirkconnel/Kelloholm and Sanquhar), and users of the A76 and B741.
- 5.60 Photographic examples of existing aviation lighting in similar light conditions will be presented in a separate appendix as a ‘control mechanism’.

Cumulative Effects

- 5.61 The LVIA will also consider the potential for any cumulative effects to arise. The requirement for consideration of cumulative effects under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017¹⁴ is set out in Schedule 4, part 5, as follows:
- “A description of the likely significant effects of the development on the environment resulting from, inter alia: (e) the cumulation of effects with other existing and/or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources”.*
- 5.62 This represents a change to the wording of the previous Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2010 which stated: *“A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development”.*
- 5.63 There is therefore no longer any requirement under the current EIA Regulations to consider the potential for cumulative impacts in relation to other developments which are yet to be awarded consent.
- 5.64 Notwithstanding this, it is acknowledged that current best practice guidance for cumulative impact assessment (Assessing the Cumulative Impact of Onshore Wind Energy Developments, (SNH, 2012))¹⁵ still refers to a consideration of proposals which are ‘awaiting determination within the planning process with design information in the public domain’ and states that ‘The decision as to which proposals in the

14 The Scottish Government (2017). The Electricity Works (Environmental Impact Assessment)(Scotland) Regulations 2017 [Online] Available at: <https://www.legislation.gov.uk/ssi/2017/101/contents/made> (Accessed 15/12/20)

15 Scottish Natural Heritage (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments [Online] Available at: <https://www.nature.scot/guidance-assessing-cumulative-impact-onshore-wind-energy-developments> (Accessed 15/12/20)

planning / consenting system should be included in an assessment is the responsibility of the determining authority.'

- 5.65 As such, it is proposed in this LVIA to consider cumulative effects caused by the development of the Site in conjunction with other sites which are either operational, under construction, consented or the subject of a full planning application. The SNH best practice guidelines identify two principal types of cumulative visual impact:
- Combined visibility – where the observer is able to see two or more developments from one viewpoint; and
 - Sequential visibility – where two or more sites are not visible at one location but would be seen as the observer moves along a linear route, for example, a road or public right of way.
- 5.66 The guidelines state that 'combined visibility' may either be 'in combination' (where two or more sites are visible from a fixed viewpoint in the same arc of view) or 'in succession' (where two or more sites are visible from a fixed viewpoint, but the observer is required to turn to see the different sites). Each of the above types of cumulative effect will be considered in the LVIA.
- 5.67 The assessment will also consider the potential cumulative effects of wind turbine aviation lighting, with reference to other wind farms that are either operational, under construction, consented or the subject of a full planning application.

Mitigation of Landscape and Visual Effects

- 5.68 As discussed in best practice guidance for EIA, mitigation measures may include:
- avoidance of effects;
 - reduction in magnitude of effects; and
 - compensation for effects (which may include enhancements to offset any adverse effects).
- 5.69 The primary mitigation adopted in relation to landscape and visual matters is likely to be embedded within the design of the Proposed Development and will comprise the consideration given to avoiding and minimising landscape and visual effects during the evolution of the Proposed Development layout. This will be set out within the Design Iteration chapter of the EIA Report, which will also address other forms of embedded mitigation such as mitigation of visible turbine lighting.

Matters Scoped Out

- 5.70 It is proposed that the following matters are scoped out of the LVIA:
- Residential Visual Amenity Assessment (RVAS) – A review of Ordnance Survey mapping and aerial photography has identified that there are no properties within 2 km of the Proposed Development. As such it is proposed that a RVAS will not be prepared. However, consideration of the effects on key settlements will be included within the main LVIA chapter.
 - Effects on Wild Land - Given the distance at which the two Wild Land areas are located in relation to the Proposed Development and taking into account the

nature of the intervening landscape in which the other existing wind farms are present and visible, it is considered that the proposed turbines would not give rise to any significant effects. Therefore, effects on Wild Land are to be scoped out of the LVIA.

- Galloway International Dark Skies Park – The Park is situated over 25 km to the south-west of the Proposed Development, with the Consented Lethans Wind Farm situated to the south-west of the Proposed Development and closer to the park. Therefore, effects on the Park are to be scoped out of the LVIA.

Questions for Consultees

Do you agree with the proposed Study Areas?

Do you agree with the proposed viewpoint locations?

Do you agree with the matters to be scoped out?

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

Are there any other wind farms you are aware of within the 20 km study area to be included the cumulative assessment?

ORNITHOLOGY

Introduction

- 5.71 This section presents the approach to be taken in carrying out an Ecological Impact Assessment (EclA) for the assessment of the impacts of the Proposed Development on ornithological receptors.
- 5.72 It describes the field surveys carried out and the data available to describe the baseline, the methods of assessments and indicates any areas which are to be scoped out of that assessment. It also reviews the designated sites in proximity to the Site and addresses what impacts will be considered for those sites.

Consultation

- 5.73 NatureScot¹⁶ were consulted on 26th March 2020 as to the survey requirements to enable the baseline to be described given the presence of data collected between November 2013 – March 2015; at that time 6 months of recent survey had been undertaken.
- 5.74 Modelling requirements were also confirmed. Because of the current population status of the species for which the Muirkirk and North Lowther Uplands Special Protection Area (SPA) is designated, observational data will not allow the impacts of the Proposed Development on the recovered SPA to be predicted. As such, modelling will be undertaken to assess how changing habitats can affect use of the Site by sensitive species and how this could affect impacts upon those species, to allow an assessment to be undertaken which will also inform Appropriate Assessment.

¹⁶ Scottish Natural Heritage (SNH) rebranded in August 2020 as NatureScot. Where relevant reference is still made to SNH within this chapter in respect of guidance which remains valid and is yet to be republished etc.

5.75 In addition, Strathclyde Raptor Study Group has been approached for data records pertinent to the Proposed Development. RSPB Scotland will also be asked to provide data records.

Study Area and Baseline

5.76 Table 5.2 summarises the ornithology surveys undertaken to date.

Table 5.2: Ornithology surveys carried out

Survey	Dates	Survey area	Survey method
Vantage point surveys	November 2013 – March 2015 October 2019 – September 2020	3 VPs (1-3 on Drawing SR07) 3 VPs (4-6 on Drawing SR08)	SNH 2013 ¹⁷ SNH 2017 ¹⁸
Breeding bird survey	April – July 2014 April – July 2020	500 m buffer around Site where access permitted	SNH 2013 SNH 2017
Breeding raptor survey	April – July 2014 April – July 2020	Proposed Development boundary plus 2 km boundary where access permitted	SNH 2013 SNH 2017 Hardey <i>et al</i> 2013 ¹⁹
Black grouse survey	April – May 2020	Proposed Development boundary plus 1.5 km where access permitted	Gilbert <i>et al</i> 1998
Winter birds	December 2013 – March 2014 November 2014 – March 2015	Proposed Development boundary plus 500 m where access permitted	SNH 2013
Winter raptors	December 2013 – March 2014 November 2014 – March 2015	Proposed Development boundary plus 2 km where access permitted	SNH 2013

5.77 Within 10 km of the Proposed Development, the following statutory designated sites were identified which have been designated for ornithological receptors.

5.78 Muirkirk and North Lowther Uplands SPA. This lies adjacent to the Proposed Development to the north and close to the Proposed Development to the east (Drawing SR09). This is underlain by two Sites of Special Scientific Interest (SSSI):

- North Lowther Uplands SSSI; and

¹⁷ SNH (2013, revised 2014). Recommended bird survey methods to inform impact assessment of onshore wind farms.

¹⁸ SNH. (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Battleby: SNH

¹⁹ Hardey, J. C, Crick, H, Wernham, C, Riley, H, Etheridge, B. & Thompson, D. (2013). Raptors A Field Guide for Surveys and Monitoring 3rd ed. Edinburgh: TSO

- Muirkirk Uplands SSSI.

5.79 Table 5.3 summarises the qualifying species of the SPA.

Table 5.3: Qualifying features of the Muirkirk and North Lowther Uplands SPA

Species	Scientific name	Population	Population Estimate	Current condition
Hen harrier	<i>Circus cyaneus</i>	Breeding	1996-1998 – 29.2 females	Unfavourable declining
		Wintering	1991-1995 – 12 individuals	Unfavourable declining
Peregrine	<i>Falco peregrinus</i>	Breeding	1992-1996 – 6 pairs	Unfavourable no change
Merlin	<i>Falco columbarius</i>	Breeding	1989-1998 – 9 pairs	Unfavourable no change
Short-eared owl	<i>Asio flammeus</i>	Breeding	1997-1998 – 26 pairs	Favourable maintained
Golden plover	<i>Pluvialis apricaria</i>	Breeding	1999 Estimated minimum 154 pairs	Unfavourable declining

5.80 Muirkirk Uplands SSSI, which lies immediately adjacent to the north of the Proposed Development is designated for a number of features including Hen harrier (both breeding and wintering), Short-eared owl (breeding) and an upland breeding bird assemblage.

5.81 The breeding bird assemblage is listed as including Teal *Anas crecca*, Buzzard *Buteo buteo*, Merlin, Peregrine, Red grouse *Lagopus lagopus*, Dunlin *Calidris alpina*, Snipe *Gallinago gallinago*, Curlew *Numenius arquata*, Redshank *Tringa totanus*, Whinchat *Saxicola rubetra*, Stonechat *Saxicola rubicola*, Wheatear *Oenanthe Oenanthe* and Ring ouzel *Turdus torquatus*.

5.82 North Lowther Uplands SSSI, which lies to the east and south of the Proposed Development is designated for breeding hen harrier and also an upland breeding bird assemblage.

5.83 The breeding bird assemblage includes Hen harrier, Short-eared owl, Merlin, Peregrine, Golden plover, Red grouse, Raven *Corvus corax*, Dunlin, Snipe, Teal, Curlew, Redshank, Whinchat and Wheatear.

5.84 Impacts on the Muirkirk and North Lowther Uplands SPA and the two underlying SSSIs will be assessed.

5.85 A further search was carried out for SPAs within 20 km with geese as qualifying interests; none were identified. As such, there are no further designated sites which will be considered by the assessment.

Assessment

5.86 Assessment methodology would follow CIEEM (2018)²⁰ guidance. The following steps would be undertaken:

²⁰ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. CIEEM, Winchester.

- Description of baseline;
- Identification of sensitive ornithological receptors;
- Identification of mitigation and good practice measures;
- Assessment of impacts; and
- Assessment of residual effects.

Potential Significant Effects

- 5.87 The key ornithological issues relating to the Proposed Development are the potential to adversely affect the conservation status of bird species of high conservation concern, such as those with statutory protection and/or to also impact on the status of the Muirkirk and North Lowther Uplands SPA.
- 5.88 These impacts can occur through habitat loss, disturbance, displacement, barrier effects and collisions with the turbines. Potential negative impacts (direct or indirect) on ornithology could arise during the construction and operation stages.

Land Take Impacts

- 5.89 Direct land take for the installation of the Proposed Development infrastructure (turbine bases, sub-station, access tracks, etc.) would result in the long-term temporary and / or permanent loss of habitat for birds within the Site, albeit such losses would be relatively small in the context of the Site as a whole.

Construction Impacts

- 5.90 Disturbance caused by construction may directly displace birds from breeding sites, directly affecting breeding success, or may temporarily displace birds from foraging areas, affecting their breeding success and winter survival.
- 5.91 The EIA Report will address and propose measures to reduce or eliminate this impact through mitigation such as seasonal timing of construction works, pre-construction surveys and the employment of an Ecological Clerk of Works (ECoW) during construction.

Operational Impacts - Disturbance / Displacement and Barrier Effects

- 5.92 The operation and maintenance of turbines has the potential to cause disturbance and displace certain bird species from the Site. During the lifetime of the Proposed Development, birds of some species at least, may habituate to the presence of turbines; however, this impact may decline in the long-term.

Operational Impacts – Collision with Turbines

- 5.93 The assessment will consider the potential collision risk to birds from the proposed turbines on the primary target species that have been identified as using the Site.

Cumulative Impacts

- 5.94 It is also important to assess the cumulative impacts of this and other operational and consented wind farms that may affect the broader populations of birds identified as target species in the survey area.
- 5.95 This will consider both quantitative effects; such as collision risk, as well as quantitative effects, such as disturbance/displacement and habitat loss and change.
- 5.96 NatureScot maintain a database of developments with potential to create collision risk for qualifying species and populations of the Muirkirk and North Lowther Upland SPA; consultation will be undertaken to obtain the latest collision estimates. For non-SPA species, the local Natural Heritage Zone (NHZ) would be considered although local impacts would also be considered due to the proximity of Lethans and Glenmuckloch.
- 5.97 A search would be undertaken to identify any wind farm developments within the NHZ or for potential effects on the SPA, those within 10 km of the SPA which have more than 3 turbines and a greater than 50 m tip height for inclusion in the cumulative assessment. The cumulative effects of forest changes as a result of Lethans Wind Farm would also be considered.

Mitigation Hierarchy

- 5.98 In the first instance avoidance of effects will be considered by scheme design; taking account of sensitive ornithological receptors present in the surrounding area.
- 5.99 Beyond that effects would be avoided where possible (for example by timetabling or buffer distances) and only if not possible, would mitigation be put in place. Due to the proximity of the SPA, it is considered unlikely compensation would be suitable but this would be adopted if necessary.

Matters Scoped Out

- 5.100 As per CIEEM guidelines, only sensitive receptors which have the possibility for significant effects to occur will be considered. As such, effects on passerine populations will be scoped out.

Questions for Consultees

Do you consider this survey effort suitable for describing a baseline, when supplemented with modelling to consider future potential impacts of the Proposed Development?

Are the stakeholders aware of any other developments which should be considered in the cumulative assessment?

ECOLOGY AND NATURE CONSERVATION

Introduction

- 5.101 The following section details the proposed scope of assessment for ecology and nature conservation. The following ecological features, where there is potential for significant effects arising from the Proposed Development, are considered:

- Sites designated for nature conservation (Drawing SR09);
 - Woodland listed on the Ancient Woodland Inventory;
 - Vegetation, flora and ground water dependent terrestrial ecosystems (GWDTEs);
 - Protected Species;
 - Fish habitat; and
 - Reptiles.
- 5.102 Data from comprehensive survey undertaken in 2014, 2019 and 2020 will be used to provide assessments where appropriate.

Consultation

- 5.103 Table 5.4 summarises consultation responses received from NatureScot²¹.

Table 5.4: NatureScot Consultation

Consultation	Summary Response
<p>NatureScot were consulted via e-mail on 05 November 2019 regarding the scope of assessment, specifically the requirement to update 2014 survey data. The following was proposed in order to provide comprehensive assessment:</p> <ul style="list-style-type: none"> • Vegetation and flora: No update survey and use of 2014 data; • Protected mammals (excluding bats): Use of update survey data for otter, pine marten, badger, red squirrel and water vole (undertaken in October 2019) and 2014 data; • Bat roosts: Use of update survey data of potential bat roosts (undertaken in 2019); • Bat activity: No update survey of bat activity and use of 2014 data to provide assessment given the relatively low levels of activity across the Site and paucity of roost sites; • Freshwater pearl mussel: No update survey given paucity of habitat and confirmation of absence from comprehensive survey in 2014; • Great crested newt: No update survey given 2014 and 2019 walkover surveys did not confirm suitable breeding habitat; and • Reptiles: Targeted, pre-construction survey and mitigation for works undertaken in the active period for reptiles. 	<p>David Kelly, NatureScot Area Officer, Strathclyde and Ayrshire, responded, via e-mail on 17 January 2020 recommending the bat survey work is updated. In addition, whilst NatureScot recognised that the areas of the Site still under the forestry that was present in 2014 are unlikely to have significantly changed it was recommended that some level of survey is carried out to provide updated information on the areas which have been felled.</p>
<p>The following was proposed and sent to David Kelly, via e-mail, on 31 January 2020:</p>	<p>David Kelly responded, via e-mail on 03 February 2020 confirming that NatureScot were content with</p>

²¹ Scottish Natural Heritage (SNH) rebranded in August 2020 as NatureScot. Where relevant reference is still made to SNH within this Report in respect of guidance which remains valid and is yet to be republished etc.

Consultation	Summary Response
<ul style="list-style-type: none"> Vegetation: A combination of the National Vegetation Classification (NVC) Survey 2014 data and contemporary data from clear-fell areas to be used to produce vegetation maps and provide an assessment of effects on vegetation and GWDTEs. The vegetation within clear-fell areas to be assigned to the nearest possible NVC community or if this is not possible because there is significant bare ground/lack of vegetation mapped as “clear-fell” or conifer plantation if re-stocked; Bat activity: An assessment of the spatial and temporal distribution of bat activity across the Site to be undertaken based on guidance given in Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation, January 2019 (full details of proposed survey methods give Para’s 5.120 and 5.121). <p>Given the previously recorded relatively low levels of activity across the Site and paucity of roost sites it is considered that static monitoring will be sufficient to provide an appropriate level of assessment.</p>	<p>the proposals for both vegetation and bat surveys</p>

Study Area and Baseline

5.104 Table 5.5 summarises the Ecological surveys undertaken to date and study areas that will be used to provide assessment of the ecological features. In addition, sites designated for nature conservation (excluding ornithology), including Special Areas of Conservation (SACs) and SSSIs and Woodland listed in the Ancient Woodland Inventory will be assessed where these are considered to be within the zone of influence of the Proposed Development.

Table 5.5: Ecology Baseline Study Areas

Ecological Feature	Dates	Study area
Vegetation, GWDTEs	July 2014; June 2020	Site Boundary and up to 250 m beyond (where there is hydrological connectivity)
Otter (<i>Lutra lutra</i>) and pine marten (<i>Martes martes</i>)	July 2014; October 2019	Site Boundary and up to 200 m beyond
Badger (<i>Meles meles</i>)	July 2014; October 2019	Site Boundary and up to 100 m beyond
Red squirrel (<i>Sciurus vulgaris</i>)	July 2014; October 2019	Site Boundary and up to 50 m beyond
Water vole (<i>Arvicola amphibius</i>)	July 2014; October 2019	Site Boundary and up to 50 m beyond

Ecological Feature	Dates	Study area
Potential bat roosts	July 2014; October 2019	Proposed turbine envelope (defined here as a polygon bounded by the outermost turbines) and 200 m beyond
Bat activity	May to September 2014; May to September 2020	Site Boundary
Fish habitat	January 2020	Site Boundary

- 5.105 The above study areas have been defined in recognition of current guidelines and are considered to be appropriate in assessing any potential effects on ecology.

Assessment

Vegetation

- 5.106 Following consultation, NatureScot advised that whilst much of the NVC Survey data obtained in 2014 is fit for purpose, a reassessment of recently felled areas of plantation is required. Therefore, a combination of the 2014 data and contemporary data from clear-fell areas will be used to produce vegetation maps and provide an assessment of effects on vegetation and GWDTEs. In addition, GIS NVC data for protected sites available via NS Natural Spaces website was used to inform on the vegetation present within adjacent SSSIs that was checked during the NVC walkover surveys in 2014.
- 5.107 NVC survey of the study area has been completed, according to *British Plant Communities* (Rodwell, 1991 - 2000) in 2014 and updated in 2020.
- 5.108 An assessment of the nature conservation significance of all vegetation within the study area will be undertaken. The methodology involves a trained surveyor visiting every parcel of land within the study site, mapping the vegetation present and classifying each unit in terms of NVC community or sub-communities. Where the vegetation is present as a mosaic of types the proportion of each NVC community or type within the mosaic was recorded. Where the vegetation present was not a good fit with published NVC communities or sub-communities, a description of the vegetation and the differences from the published communities is given.
- 5.109 During the field surveys extensive use was also made of target notes in order to provide descriptive information and the location of rare or localised species and/or habitats. The location of target notes were taken using hand-held GPS, allowing provision of 10-figure grid references. An assessment of individual areas of the main semi-natural habitats was made by fieldworkers as the survey progressed in order to provide comprehensive assessment in the EIA Report. The field assessment involved consideration of each habitats' naturalness, size, rarity, diversity and position in an ecological unit.
- 5.110 The nature conservation appraisal of all habitats and plant species takes account of UK and European legislation and both Scottish Biodiversity List (SBL) and Local Biodiversity Action Plan Priority (LBAP) Habitats and Species.

- 5.111 Plant species of conservation significance, defined as species on *Red Data List* (Cheffings & Farrell, 1996), SBL and LBAP were also recorded when encountered.

Protected Mammals (excluding bats)

- 5.112 A systematic search for protected mammal species places of shelter and signs has been undertaken throughout their respective study areas in 2014 and 2019 based on standardised survey methods in: Ward *et al.* (1994) for otter; Birks (2012) for pine marten; Gurnell and Lurz (2012) for red squirrel; and Harris *et al.* (1989) for badger and based on Strachan *et al.* (2006) for water vole. As well as sightings of protected mammal species, evidence of the presence/recent presence of species including prints, paths, droppings, places of shelter (including holes, setts, holts, dreys, dens, roosts, nest sites) and feeding remains were recorded and mapped where encountered.

Bats

- 5.113 Survey and assessment of bats has been/will be undertaken according to current guidance (Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation, January 2019) and Bat Surveys for Professional Ecologists – Good Practice Guidelines produced by Bat Conservation Trust (Collins 2016).

Bat Roosts

- 5.114 An assessment of the presence of bat roosts within the study area has been undertaken according to current guidance as detailed in in *Bat Surveys for Professional Ecologists – Good Practice Guidelines produced by Bat Conservation Trust* (Collins 2016) in Autumn 2019.
- 5.115 A daytime assessment has been undertaken of the suitability of trees within the study area for bat roosts. No buildings or structures were present within the study area. Trees were inspected for signs of bats from the ground, such as droppings, worn entrances and staining. For each tree containing potential bat roost features, an estimation was made of the trees diameter at breast height (dbh) to the nearest 5 cm and height above ground level (agl) to the nearest 1 m, and the location and type of feature (e.g. hazard beam, knot hole, etc.) recorded.
- 5.116 Three trees with potential roost features were identified from ground level. However, further aerial inspection confirmed that none of the features provided suitable conditions for roosting bats.

Bat Activity Surveys

- 5.117 Following consultation, NatureScot advised that the 2014 survey data is no longer fit for purpose. Therefore, an assessment of the spatial and temporal distribution of bat activity across the Site will be undertaken based on guidance given in *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*, January 2019.
- 5.118 Ground-level static detector surveys using full spectrum Anabat Swift detectors were completed across the period April to October (inclusive) 2020. Ten individual detectors (assuming a maximum of 10 turbine locations) were located at potential turbine locations and/or distributed across the Site to represent the different habitats and topographical features present including existing clearings and rides. Detectors were set out for a minimum of 15 consecutive nights during 3 periods equating to spring (April – May), summer (June – mid-August) and autumn (mid-August –

October). The detectors were left for a period of 15 nights for each season to maximise the potential for recording 10 nights bat activity data during appropriate weather conditions.

Fish Habitat

- 5.119 A Fish Habitat Survey was completed in 2020 of all watercourses within the study area, and consideration given to the following species of conservation significance: European eel (*Anguilla anguilla*), Atlantic salmon (*Salmo salar*), brown trout/sea trout (*Salmo trutta*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), and sea lamprey (*Petromyzon marinus*).
- 5.120 A walkover survey was completed in order to map the extent and location of fish habitats. Each stretch of watercourse was systematically walked during normal flow conditions (involving in-stream survey where required), and the habitats mapped according to the classification presented in Table 5.6. The fish habitat classification is based on the Scottish Fisheries Co-ordination Centre's *Habitat Surveys Training Course Manual* (SFCC 2007), and the Environment Agency's *Restoration of Riverine Salmon Habitats Guidance Manual* (Hendry & Cragg-Hine, 1997) and a review of key habitat requirements for other species of conservation significance listed above (e.g. Maitland, 2003; Hendry & Cragg-Hine, 2003). No detailed electro-fishing surveys has been undertaken.
- 5.121 At approximately 100 m intervals a description of the channel and substrate was completed over a sample 10 m section. The following information will be collected at each sample location: substrate composition (% bedrock, boulders >256 mm, cobbles 65-256 mm, pebbles 4-64 mm, gravel 2-4 mm, coarse sand 0.5-2 mm and fine sand/silt/peat <0.5 mm); average wetted channel width, gradient, average depth (m) and turbidity (1 [clear] – 3 [turbid]). A photograph was taken looking upstream at each of the survey points.
- 5.122 The key output of the Fish Habitat Survey will be a quantitative assessment of fish habitat types, namely: extent of non-productive fish habitat, extent of salmonid adult refuge habitat, extent of spawning, juvenile and fry habitats. This will allow for analysis of the suitability of watercourses for each of the above fish species, and whether there is potentially critical habitat (e.g. spawning habitat) present within the study area.

Table 5.6: Fish Habitat Survey Classification

Cat.	Habitat Type	Description	Species Suitability
1	Unsuitable	Usually 1 st – 2 nd order watercourses with steep gradient, ≥5% slopes (often substantially greater), abundant bedrock, lack of fixed substrates, high velocity (e.g. headwaters/rivulets). Also includes less steep ephemeral stretches (e.g. headwater sources), shallow drains and modified watercourses with dry beds	No productive fish habitat, although some species may migrate through these areas depending on whether they represent a migration barrier
1a	Steep > 10% gradient		
1b	6-10% gradient		
1c	Other – ephemeral, shallow drains, dry beds		
2	Spawning habitat	Stable “gravels” of minimum 15-30 cm depth, optimal 20-30 mm, not	Spawning habitat - Atlantic salmon (c. 9 m ²)

Cat.	Habitat Type	Description	Species Suitability
2a 2b	Salmonids Lamprey	compacted or with excessive silt/sands (<20% by weight) for salmonids. Lamprey spawning habitat where "gravels" include sands. Often at tail end of pools or upstream ends of riffle-runs ensuring oxygenated substrate. Can also be found at end of weir pools	per pair) and sea/brown trout; lamprey
3	Riffle	Shallow (< 20 cm) and fast flowing, with upstream-facing wavelets which are unbroken (although often some broken water), with substrate dominated by gravel and cobbles	Fry (0+) habitat – Atlantic salmon/ brown trout/sea trout
4 4a 4b	Run Shallow (<0.5 m deep) Deep (>0.5 m deep)	Generally deeper (20-40 cm) and less steep bed compared to riffle, with substrate of boulders, cobbles and gravels. Usually disturbed, rippled surface. Often located immediately downstream of riffle	Mixed salmonid juvenile habitat. Fry (0+) & Par (1+) habitat - Atlantic salmon/ brown trout/sea trout
5 5a 5b	Glide Shallow (<0.5 m deep) Deep (> 0.5 m deep)	Shallow gradient stretches with smooth laminar flow with little surface turbulence and generally > 30 cm deep; water flow is silent. Often located below pool	European eel; non-productive salmonid habitat, although may provide some shelter for adults
6 6a 6b 6c	Pool Plunge/Scour pool Meander pool Weir/bridge pool	No perceptible flow, eddying and usually > 100 cm deep. Substrate with high proportion of sand and silts. Often located on the outside of meanders, but includes natural scour or plunge pools and artificial weir pools	Adult refugia Atlantic salmon, sea/brown trout, European eel
7 7a 7b 7c	Rapids Steep - >10% gradient Moderate - 6-10% gradient Low - <6% gradient	Sections of relatively steep gradient with fast currents and turbulence, with mixed flow types, including free-fall, chutes and broken, with obstructions such as large boulders, rock outcrops and falls	Negative feature for migratory species and may pose a migratory barrier; elvers and yellow eels limited to velocity of <0.5 m/sec and 2.0 m/sec respectively; lamprey to 2 m/sec.
8 8a 8b	Banks of fine sediment Optimal Sub-optimal	Limited flow (sometimes back-flow) allowing deposition of silts/sands, not anoxic, with/without riparian trees. Optimal habitat is stable fine sediment and sand ≥15 cm deep with some organic detritus. Sub-optimal habitat includes small areas of deposited silts/sands behind boulders	Lamprey ammocoete nursery and adult refuge
9	Vegetation features		

Cat.	Habitat Type	Description	Species Suitability
9a	Riparian trees (tunnel)	Closed woodland canopy forming tunnel vegetation	Tunnel riparian trees may be negative feature for salmonids, although tree roots and fallen trees may provide refugia for Atlantic salmon/ brown trout/sea trout and European eel. Aquatics/emergents provide cover for fish, particularly juveniles
9b	Flow constriction	In-stream emergent/boulders forming constriction of flow	
9c	Aquatic macrophytes	Stands of aquatic and floating vegetation	
9d	Emergent macrophytes	Stands of emergent (usually marginal) vegetation	
9e	Large woody debris	LWD forming dams, etc.	
10	Obstructions to migration	Impassable waterfalls, rapids, flow constrictions, weirs, bridge sills, culverts, shallow braided river sections, pollution preventing upstream migration	All migratory species; impassability varies between species. Leaping ability: <3.7 m Atlantic salmon; <1.81 trout; European eel and lamprey none
11	Other features	Includes other channel features, with side channel (connected to main channel) and backwaters. Artificial channels may comprise either man-made banks and/or beds. Standing waters include all on-line open waters.	Side channel/backwater often important refugia for juveniles. Artificial channels have limited diversity and are often non-productive fish habitat. Standing water includes all on-line open water (e.g. lochs, ponds, etc.)
11a	Side channel		
11b	Backwater		
11c	Artificial channel		
11d	Standing water		
12	Inter-tidal	Includes all inter-tidal habitats as defined by relevant OS 1:10,000/ 1:25,000 maps	Critical habitat for migratory fish by providing passage, refuge, rich foraging and suitable environment for juvenile salmonids during smoltification
12a	Mud/sand		
12b	Shingle/cobble		
12c	Boulder/rock		
12d	Saltmarsh		

Ecological Impact Assessment

5.123 An Ecological Impact Assessment (EclA) will be undertaken by consideration of best practice guidance outlined in CIEEM guidelines (2018), and professional judgement, in order to provide a methodology that is robust and fit for purpose. The following provides an outline of the methodology that will be used to provide a structured approach to determining potential adverse effects of the project:

- Evaluation of biodiversity value of ecological features;
- Impact assessment of the Proposed Development;
- Recommendations to avoid impacts through project design (where possible);
- Provision of mitigation measures to reduce effects to acceptable levels;
- Provision of compensation measures to further reduce effects that cannot be fully mitigated or reduced to acceptable levels; and

- Assessment and statement of residual effects of the Proposed Development.

Evaluation of Biodiversity Value

- 5.124 The first stage of EclA involves applying a biodiversity value to each ecological feature (i.e. species, vegetation type or group) present within the defined study areas. Ecological features are assigned a value based on evaluation criteria adapted from existing guidelines and professional judgement. Ecological features are assigned a value according to a scale of Negative to International Value.

Impact Assessment of Proposed Development

- 5.125 In order to define the implications of the Proposed Development on biodiversity an impact assessment of the project will be completed. Methods of impact prediction used in this assessment will include direct measurements and expert opinion. Published information (where available) will also be used to determine impacts. Impacts will be considered in relation to the probability of the impact occurring, whether they are predicted to be direct, indirect, temporary, permanent, reversible or irreversible.
- 5.126 For each potential impact of the Proposed Development, an assessment of impact magnitude will be provided. The magnitude of an impact will be assessed in conjunction with the value of the ecological feature to provide an assessment of effect significance. Impact magnitude is ranked according to a scale of None to High, based on increasing magnitude. A Positive category is also provided to indicate where there is a predicted increase in biodiversity value compared to the base-line.

Potential Significant Effects

- 5.127 For the purpose of this assessment a significant effect on biodiversity is defined, as outlined in CIEEM (2018) guidelines on EclA, as an effect that either supports (positive) or undermines (negative) biodiversity conservation objectives for important ecological features. As stated by CIEEM (2018) it should be noted that a significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission.

Mitigation Hierarchy

Avoidance Measures

- 5.128 Avoidance measures (where required and possible) will be recommended that will avoid impacts on ecological features, such as consideration of alternative sites, revision of Site layout/extent, etc.

Mitigation Measures

- 5.129 Mitigation measures will be recommended where it is anticipated that a significant effect may result without measures being implemented or in accordance with Best Practice guidelines, or to fulfil legal obligations.

Compensation Measures

- 5.130 Compensation measures are recommended where it is anticipated that a significant residual effect may result even with avoidance and/or mitigation measures being implemented.

Matters Scoped Out

- 5.131 Assessment of great crested newt has been scoped out of this assessment due to lack of suitable breeding habitat within and around the Site Boundary (confirmed by walkovers in 2014 and 2019).
- 5.132 Assessment of freshwater peal mussel has been scoped out since comprehensive survey in 2014 confirmed their absence in the study area.
- 5.133 Initial analysis of field survey data suggests that there will be no or negligible predicted residual effects on ecology and nature conservation following implementation of Project Design and mitigation measures (pollution/sedimentation prevention measures, avoidance of works with potential to affect statutory designated sites etc.) to protect all ecological features, including the adjacent Muirkirk Uplands SSSI and North Lowther Uplands SSSI. Therefore, cumulative effects (i.e. in combination effects with other, similar developments) on ecology and nature conservation will be scoped of assessment.

Questions for Consultees

Are Consultees content with the proposed baseline ecology surveys for vegetation, flora, GWDEs and protected species, and the level of survey effort?

Are Consultees content with the proposed approach to the evaluation and impact assessment methods?

Are Consultees content with matters scoped out of assessment?

Can Consultees provide details or any current or recent ecological records, works or projects within or in the vicinity of the Site, which may not yet be in the public domain?

NOISE

Introduction

- 5.134 Noise will be emitted as a result of the Proposed Development during the construction, operation and decommissioning phases. This section provides a summary of the noise effects anticipated at each stage of the development and, where appropriate, details of the proposed assessment work.
- 5.135 The Site is located within a rural location where background noise levels are anticipated to be relatively low. There are a number of scattered residential properties around the Site, with the closest located approximately 2,100 m to the east of the Proposed Development.
- 5.136 There are a number of operational wind farm developments within the vicinity of the Proposed Development therefore an assessment will be undertaken to consider the potential cumulative noise impacts.

Construction Noise

- 5.137 Noise emitted during the construction and decommissioning phase will be temporary and short term in nature and can be minimised through careful construction practices. The effective control of these impacts can be achieved by way of a suitable planning

condition. In addition to planning conditions, should consent be granted, construction and decommissioning noise can be controlled through the use of two legislative instruments which address the effects of environmental noise with regard to construction noise, vibration, and nuisance:

- The Environmental Protection Act 1990 (EPA)²²; and
- The Control of Pollution Act 1974 (CoPA)²³.

5.138 The CoPA provides two means of controlling construction noise and vibration. Section 60 provides the Local Authority with the power to impose at any time operating conditions on the development Site. Section 61 allows the Developer to negotiate a set of operating procedures with the Local Authority prior to commencement of site works.

5.139 A construction noise assessment will be undertaken using data provided in British Standard (BS) 5228: Part 1: 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Noise'²⁴ and the calculation methodology provided in ISO9613-2:1996 'Acoustics - Attenuation of sound during propagation outdoors' -Part 2: General method of calculation'²⁵. Impacts will be assessed using criteria contained within BS5228-1:2009+A1:2014 and, where appropriate, mitigation measures will be proposed.

5.140 An assessment of the potential noise emissions during the decommissioning phases of the Proposed Development will be undertaken as part of the construction noise assessment. The impacts of the decommissioning phase will be assessed and, where appropriate, mitigation measures will be proposed.

Operational Noise

5.141 The Scottish Government's Planning Advice Note PAN1/2011 'Planning and Noise'²⁶ refers to the 'Onshore Wind Turbines' web-based document which in turn states that ETSU-R-97 'The Assessment and Rating of Noise from Windfarms'²⁷ should be used by Planning Authorities 'to assess and rate noise from wind energy developments until such time that an update is available.' The web-based document also refers to the Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise'²⁸ (IOA GPG) as a source, which provides:

'significant support on technical issues to all users of the ETSU-R-97 method for rating and assessing wind turbine noise, and should be used by all IOA members and those undertaking assessments to ETSU-R-97. The Scottish Government accepts that the guide represents current industry good practice.'

5.142 ETSU-R-97 details a methodology for establishing noise limits for proposed wind farm developments and these limits should not be exceeded. ETSU-R-97 states that noise

22 UK Government (1990) Environmental Protection Act 1990. Available at <https://www.legislation.gov.uk/ukpga/1990/43/contents>

23 UK Government (1974) Control of Pollution Act 1974. Available at <https://www.legislation.gov.uk/ukpga/1974/40>

24 British Standard BS5228-1: 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Noise'

25 International Standards Organisation ISO9613: 1996 'Acoustics – Attenuation of sound during propagation outdoors Part 2: General method of calculation'

26 Scottish Government, Planning Advice Note PAN 1/2011: 'Planning and Noise'

27 ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms' (ETSU-R-97)

28 Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (2013)

limits should be set relative to existing background noise levels at the nearest receptors and that these limits should reflect the variation in both turbine source noise and background noise with wind speed. Separate noise limits apply for quiet daytime and for night-time periods. Quiet daytime limits are chosen to protect a property's external amenity, and night time limits are chosen to prevent sleep disturbance indoors, with windows open.

- 5.143 ETSU-R-97 recommends that wind farm noise for the quiet daytime periods should be limited to 5 dB(A) above the prevailing background or a fixed minimum level within the range 35 - 40 dB $L_{A90,10min}$, whichever is the higher. The precise choice of criterion level within the range 35 – 40 dB(A) depends on a number of factors, including the number of dwellings in the neighbourhood of the wind farm (relatively few dwellings suggest a figure towards the upper end), the effect of noise limits on the number of kWh generated (larger sites tend to suggest a higher figure) and the duration and level of exposure to any noise. These factors will be taken into account with justification for deriving suitable noise limits included in the noise assessment.
- 5.144 An exception to the setting of both the quiet daytime and night time fixed minimum limit occurs where a property occupier has a financial involvement with the Proposed Development. In that case the fixed minimum limit can be increased to 45 dB $L_{A90,10min}$ or the prevailing background noise $LA90$ plus 5 dB, whichever is the greater for both the quiet daytime and night-time periods.
- 5.145 A background noise survey may not be required for situations where predicted wind turbine noise levels at the nearest noise sensitive properties is limited to an $L_{A90,10min}$ of 35dB(A) up to wind speeds of 10m/s at 10m, as the protection of the amenity of those properties can be controlled through a simplified noise condition as detailed in ETSU-R-97. ETSU-R-97 states that:
- 'For single turbines or wind farms with very large separation distances between the turbines and the nearest properties, a simplified noise condition may be suitable. If the noise is limited to an $L_{A90,10min}$ of 35dB(A) up to wind speeds of 10m/s at 10m height, then this condition alone would offer sufficient protection of amenity, and background noise surveys would be unnecessary.'*
- 5.146 Where background noise levels are predicted to exceed the simplified noise criteria (or if cumulative noise has the potential to constrain development) then background noise levels will be established at key locations around the Proposed Development. Noise limits will be set relative to existing background noise levels at the nearest receptors and these limits will reflect the variation in background noise with wind speed.
- 5.147 Background noise monitoring has been undertaken at a number of properties surrounding the Site as part of previous noise assessments undertaken for other wind farm developments in the area (including the Consented Lethans Wind Farm). It is anticipated that this data can be used to assess the Proposed Development and to set suitable noise limits which could be adopted upon consent.
- 5.148 Detailed consultation will be undertaken with the Council's Environmental Health Department prior to the commencement of the noise assessment in order to agree which background noise level datasets will be used and the overall assessment methodology.
- 5.149 The noise assessment will include predictions of likely wind turbine noise levels across a range of wind speeds to demonstrate compliance with the noise limits. A cumulative noise assessment will also be undertaken in order to consider the

consented, operational and proposed wind farms within the vicinity of the Proposed Development. The assessment will be undertaken in accordance with ETSU-R-97 and the IOA GPG.

Matters Scoped Out

Vibration

- 5.150 Given the nature of construction activities proposed and the relative distances from residential receptors, the risk of ground borne vibration impacting on residential receptors is considered very low, as such a vibration assessment will not be undertaken.

Low-Frequency Noise

- 5.151 A study²⁹, published in 2006 by acoustic consultants Hayes McKenzie on the behalf of the Department of Trade and Industry (DTI), investigated low frequency noise from wind farms. This study concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines.
- 5.152 In February 2013, the Environmental Protection Authority of South Australia published the results of a study into in infrasound levels near wind farms³⁰. This study measured infrasound levels at urban locations and rural locations with wind turbines close by, and rural locations with no wind turbines in the vicinity. It found that infrasound levels near wind farms are comparable to levels away from wind farms in both urban and rural locations. Infrasound levels were also measured during organised shut downs of the windfarms; the results showed that there was no noticeable difference in infrasound levels whether the turbines were active or inactive.
- 5.153 Bowdler et al., (2009)³¹ concluded that:
'...there is no robust evidence that low frequency noise (including 'infrasound') or ground-borne vibration from wind farms generally has adverse effects on wind farm neighbours'.
- 5.154 More recently during a planning Appeal (PPA-310-2028, Clydeport Hunterston Terminal Facility, approximately 2.5 km south-west of Fairlie, 9 Jan 2018), the health impacts related to low frequency noise associated with wind turbines were considered at length by the appointed Reporter (Mr M Croft). The Reporter considered evidence from Health Protection Scotland and the National Health Service. In addition, he also considered low frequency noise surveys undertaken by the Appellant and the Local Authority both of which demonstrated compliance with planning conditions and did not identify any problems attributable to the turbine operations; some periods with highest levels of low frequency noise were recorded when the turbines were not operating.
- 5.155 The Reporter concluded that:

29 Hayes McKenzie (2006). 'The measurement of low frequency noise at three UK windfarms', Hayes Mckenzie, The Department for Trade and Industry, URN 06/1412, 2006.

30 Environment Protection Authority (2013). 'Infrasound levels near windfarms and in other environments'. Available Online At: http://www.epa.sa.gov.au/xstd_files/Noise/Report/infrasound.pdf

31 Bowdler et al (2009). 'Prediction and Assessment of Wind Turbine Noise: Agreement about relevant factors for noise assessment from wind energy projects'. Acoustics Bulletin, Vol 34 No2 March/April 2009, Institute of Acoustics.

- The literature reviews by bodies with very significant responsibilities for the health of local people found insufficient evidence to confirm a causal relationship between wind turbine noise and the type of health complaints cited by some local residents;
 - The NHS's assessment is that concerns about health impact are not supported by good quality research; and
 - Although given the opportunity, the Community Council failed to provide evidence that can properly be set against the general tenor of the scientific evidence.
- 5.156 It is therefore not considered necessary to carry out specific assessments of low frequency noise and that it should be scoped out.

Amplitude Modulation

- 5.157 In its simplest form, Amplitude Modulation (AM), by definition, is the regular variation in noise level of a given noise source. This variation (the modulation) occurs at a specific frequency, which, in the case of wind turbines, is defined by the rotational speed of the blades, i.e. it occurs at the rate at which the blades pass a fixed point (e.g. the tower), known as Blade Passing Frequency.
- 5.158 A study³² was carried out in 2007 on behalf of the Department for Business, Enterprise and Regulatory Reform (BERR) by the University of Salford, which investigated the incidence of noise complaints associated with wind farms and whether these were associated with AM. The study defined AM as aerodynamic noise from wind turbines with a greater degree of fluctuation than normal at blade passing frequency. Its aims were to ascertain the prevalence of AM on UK wind farm sites, to try to gain a better understanding of the likely causes, and to establish whether further research into AM is required.
- 5.159 The study concluded that AM had occurred at only a small number (4 of 133) of wind farms in the UK, and only for between 7% and 15% of the time. It also stated that, the causes of AM are not well understood and that prediction of the effect was not currently possible.
- 5.160 This research was updated in 2013 by an in-depth study undertaken by Renewable UK³³, which has identified that many of the previously suggested causes of AM have little or no association to the occurrence of AM in practice. The generation of AM is based upon the interaction of a number of factors, the combination and contributions of which are unique to each site. With the current state of knowledge, it is not possible to predict whether any particular site is more or less likely to give rise to AM, and the incidence of AM occurring at any particular site remains low, as identified in the University of Salford study. The report includes a sample planning condition to address AM, however that has not yet been validated or endorsed by UK Government.

³² University of Salford (2007). 'Research into aerodynamic modulation of wind turbine noise'. Report by University of Salford, The Department for Business, Enterprise and Regulatory Reform, URN 07/1235, July 2007.

³³ Renewable UK (2013). 'Wind Turbine Amplitude Modulation: Research to improve understanding as to its Cause and effects', Renewable UK, 2013.

- 5.161 In 2016, the IOA proposed a measurement technique to quantify the level of AM present in any particular sample of windfarm noise³⁴. In August 2016 a report written by WSP/Parsons Brinkerhoff was published by the Department of Business, Energy & Industrial Strategy (BEIS, formerly The Department of Energy & Climate Change) who have published guidance³⁵. The report sought to build on the conclusions of the IOA study in order to define an appropriate assessment method for AM, including a penalty scheme and an outline planning condition.
- 5.162 In November 2017, an article entitled ‘A planning condition for wind farms’ was published in Vol 42 No 6 of the Acoustics Bulletin magazine. The article was written collaboratively by a number of noise consultants and suggested a noise planning condition which included consideration of AM. The authors noted in the article that:
‘Whilst local authorities and developers have waited for a planning condition that could be applied to newly consented wind farms, or to those already consented but with a suspensive condition, the report Wind Turbine AM Review (WTAMR) by WSP/Parsons Brinckerhoff for DECC arguably did not provide that. In addition, there have been a number of comments on WTAMR that we consider should be addressed.’
- 5.163 The article then went on to propose a draft condition but noted that: *‘This approach is proposed based on the current state of understanding, but may be subject to modification in light of new research and further robust information.’* And *‘As various people before us have discovered, the derivation of a penalty is not easy. There is not sufficient reliable research to be confident that a penalty system would always provide a fair indication of the impact of AM.’*
- 5.164 At the time of writing there has been no official response to those recommendations from the IOA Noise Working Group and, as yet, no endorsement from any Scottish Government Minister or Department. The recommendation to impose a planning condition and the associated penalty scheme is at odds with the advice from the IOA GPG which currently states (paragraph 7.2.10):
‘7.2.1 The evidence in relation to “Excess” or “Other” Amplitude Modulation (AM) is still developing. At the time of writing, current practice is not to assign a planning condition to deal with AM.’
- 5.165 At time of writing there is no agreed methodology which can be used to predict the occurrence of AM or an agreed methodology which can be used to determine whether the effects of AM, should it occur, are likely to be significant. On that basis it is considered therefore that amplitude modulation should be scoped out.

Questions for Consultees

Do you agree that vibration, low frequency noise and Amplitude Modulation should be scoped out of the assessment?

³⁴ Institute of Acoustics, (2016) A Method for Rating Amplitude Modulation in Wind Turbine Noise

³⁵ BEIS, (2016), Review of the evidence on the response to amplitude modulation from wind turbines

CULTURAL HERITAGE AND ARCHAEOLOGY

Introduction

5.166 The Cultural Heritage and Archaeology chapter and baseline of the EIA Report will consider the historic environment within and in the vicinity of the Site. This will comprise archaeology, built heritage and the historic landscape. Designated assets will be considered, comprising scheduled monuments, listed buildings, conservation areas, gardens and designed landscapes included in the Inventory, battlefield included in the Inventory and World Heritage Sites. Non-designated assets include archaeological sites and findspots, locally importance buildings and non-designated historic landscapes including non-designated gardens and parks.

5.167 The assessment will identify assets, set out their key characteristics and the contribution made by their setting and then utilising tools of analysis including site visits, desk-based assessment and visual aids such as photomontages and wirelines will assess the potential for effects upon the heritage assets arising from the Proposed Development.

Study Area and Baseline

5.168 It is proposed that for designated assets, a study area of 10 km will be utilised from the Site boundary to identify assets, however it is acknowledged that a rigid study area may have the effect of excluding assets which lie outside the 10 km but within the ZTV and have aspects of their key character which are reliant upon long-distance views. As such, although the 10 km study area will be the primary study area, assets outside of this, but within the ZTV will be examined up to a distance of 20 km to identify those which may have the potential to experience an impact from the proposed wind turbines. An example of this is Dumfries House, a garden listed on the Inventory of Gardens and Designed Landscapes which contains a number of listed building including three Category A. This asset is located just beyond the 15 km boundary from the Site's western extent; however, the entire garden boundary is located within the ZTV and it may be that there are specific designed views which form a key part of this landscape which may experience effects from the proposed turbines.

5.169 For non-designated assets, sourced from the West of Scotland Archaeology Services (WoSAS), a study area of 1 km from the Site is proposed. This is considered sufficient to gain an understanding of the archaeological context.

5.170 Within the 10 km study area (without the ZTV applied) from the Site are the following designated heritage assets:

- Six scheduled monuments;
- One Category A listed building;
- 38 Category B listed buildings;
- 31 Category C listed buildings; and
- One conservation area.

5.171 A review of the Cultural Heritage chapter of the EIA Report submitted in support of the Consented Lethans Wind Farm has also been undertaken to identify key assets,

including non-designated assets, which were considered as part of that application, but may experience new effects as a result of this extension scheme.

- 5.172 The baseline will involve a sieving process which will be desk-based to begin with. Assets within the 10 km which lie outside of the ZTV will be discarded from further assessment, after ensuring that they do not have aspects of their setting which are not purely visual – that is to say they do not have historical or artistic associations with the Site which may form part of their setting. Following this, the reduced list of assets will be assessed and either taken forward for further consideration or discarded using professional judgement. There are certain types of asset which have such a limited or specific setting, such as milestones, or bridges, that unless a scheme were to make a specific impact, such as changing the route of a road rendering the bridge redundant, development would not cause any change to the key characteristics. Assets such as these will be removed from further assessment leaving only those assets where there is considered to be the potential for an impact to be taken forward for further assessment, and subject to a site visit.
- 5.173 As part of the baseline process, a site visit will be undertaken. This will fulfil two purposes. Firstly, the site visit will involve a site walkover to observe the site conditions and to identify, as far as possible, unidentified sites. Then, the assets identified from the sieving process undertaken as part of the desk-based assessment work will be visited and assessed in terms of identifying their setting and identifying how or if the proposed Site contributes to the key characteristics of these assets through setting and views. In order to assist with the assessment of setting, the Historic Environment Scotland guidance Managing Change in the Historic Environment: Setting (2020) will be utilised, following the staged process as set out within the document.
- 5.174 Throughout the baseline and the EIA Report chapter, consultation will continue with WoSAS and Historic Environment Scotland. It is hoped that the viewpoints and methodology put forward within this scoping exercise is acceptable and further consultation will seek to further agree matters of assessment where needed.

Assessment

- 5.175 The assessment of potential impacts to the sieved assets will be undertaken, building on the work within the baseline.
- 5.176 Historic Environment Scotland, together with NatureScot produced an Environmental Impact Assessment Handbook (2018) which will be used as a guide in the assessment process. The initial stage of the process will be to identify the value of the asset (Table 5.7). That is not simply a reflection of any designated status but takes into account other factors, allowing archaeological assets which may be of schedulable quality, but not formally designated to be considered as of the same value as a designated asset within the assessment process. This process is outlined in Table 5.7.

Table 5.7: Criteria for establishing the Value of Assets table

Value of asset	Criteria
High	Remains of inscribed international importance, such as World Heritage Sites. Conservation Areas of high value. Category A Listed Buildings. Scheduled Monuments. Gardens and Landscapes which appear on the Inventory. Battlefields which appear on the Inventory. Non-designated assets of schedulable quality and importance. Historic landscapes of international sensitivity with exceptional coherence, time-depth, whether designated or not.
Medium	Category B & C Listed Buildings. Conservation areas of local quality and regional value. Assets that can be shown to have particularly important qualities in their fabric or historical association or can contribute significantly to acknowledged international or national research objectives. Designated landscapes of high quality and importance, and of demonstrable national sensitivity.
Low	Non-designated assets of local importance. Assets of limited value, but with the potential to contribute to local research Historic landscapes with specific and substantial importance to local interest groups, but with limited sensitivity
Not Significant	Archaeological sites compromised by poor preservation. Sites of findspots (asset previously removed) with no contextual associations. Assets identified as having no historic, evidential, aesthetic or communal interest.

- 5.177 As part of this assessment of value, the contribution made by setting will be set out in terms of a positive, negative or neutral contribution and an assessment will be made of how sensitive the setting of the asset is to change. This will be set out within the narrative, rather than following a tabulated system. The reason for this is the setting of an asset is not homogenous – it will change and encompass many different elements, depending on the asset. Therefore, trying to assign a single level of sensitivity to setting would not be an effective way of assessing change.
- 5.178 Following this, the magnitude of the impact will be set out. This level of magnitude is arrived at without reference to the value of the asset. The criteria are set out in Table 5.8 below.

Table 5.8: Factors for Assessing the Magnitude of Impact

Impact	Criteria
High	Total removal or substantial alteration of asset, such that the physical resource and the key components of its setting are totally altered resulting in complete change to an asset's setting and/ or loss of heritage value of the asset.
Medium	Partial alteration of an asset, such that the heritage value of the resource and the key components of its setting are clearly modified.

Low	Minor alteration of an asset, such that the components of its setting are changed, but the physical characteristics are not affected and the impact does not result in a loss of heritage value.
Minimal	Slight changes to historic elements that hardly affect the setting of an asset and do not result in any loss of value.
No impact	No change to fabric or a change to setting which does not result in any harm to the key characteristics of the asset.

5.179 The resultant residual effects will then be determined. The effects are expressed both before the application of additional mitigation measures, then, when mitigation measures are applied, the residual effects of the scheme are set out. The matrix is set out in Table 5.9 below.

Table 5.9: Matrix for establishing Cultural Heritage Effects

MAGNITUDE OF EFFECT	SENSITIVITY OF RECEPTOR			
	High	Medium	Low	Not significant
High	Major	Major	Moderate	Neutral
Medium	Major	Moderate	Minor	Neutral
Low	Moderate	Minor/Moderate	Minor	Neutral
Minimal	Minor	Minor	Minor	Neutral
No impact	Neutral	Neutral	Neutral	Neutral

5.180 It is understood that a matrix-led approach can sometimes artificially inflate or diminish the actual levels of effect experienced by an asset through the rigidity of the process. Professional judgement will be applied to the use of the matrix and the conclusions will also be set out within the narrative of the report to ensure a true reflection of the level of effect arising from the scheme is set out.

5.181 There will be close collaboration with the LVIA team during the assessment process, with the material produced by the team, including photomontages, used as a tool to aide in the assessment. Three of the LVIA viewpoints will also be used for heritage purposes and a further four specific heritage viewpoints have been identified as detailed in Table 5.10.

Table 5.10: Heritage Viewpoints

Viewpoint Ref	Location
VP5	Kyle Castle
VP13	Cairn Kinney
VP14	Cairn Table Hill
Heritage VP1	Dumfries House GDL
Heritage VP2	Kemps Castle, fort 320m SW of Euchar Bridge
Heritage VP3	Connor Hill Enclosure
Heritage VP4	Sanquhar Conservation Area

5.182 As part of the assessment, the cultural heritage chapter will consider the cumulative impacts from operational and consented schemes within a given study area. Where necessary, consultation with the LVIA team will identify wireline locations from

heritage assets to provide visual material to aide in the assessment of potential cumulative effects

Potential Significant Effects

- 5.183 There is the potential for direct effects upon archaeological resources within the footprint of the proposed turbines, if such resources are present within the footprint of the turbines and/or ancillary infrastructure. These may be significant.
- 5.184 All other effects will be to the key characteristics of assets through changes within elements of their setting which make a contribution to the asset. It is considered that the potential for significant effects upon heritage assets from the proposed development is limited. Without prejudice to the outcomes of additional research and the visual assessment, it is considered at present that the following assets as shown on Drawing SR10 have the potential to experience significant effects arising from the scheme:
- Kyle Castle, 200m E of Dalblair scheduled monument (SM3311);
 - Connor Hill enclosure non-designated asset;
 - Cairn Kinny scheduled monument (SM4275);
 - Cairn Table scheduled monument (SM4631);
 - Dumfries house GDL and listed buildings within;
 - Kemps Castle, fort 320m SW of Euchar Bridge scheduled monument (SM656); and
 - The grouping of listed buildings within Sanquhar and the Sanquhar conservation area to the south-east of the Site.

Matters Scoped Out

- 5.185 No heritage matters can be scoped out of the assessment at present.

Questions for Consultees

Questions?

Do the Council and Consultees agree with the proposed methodology and scope of assessment?

Are the Council and Consultees content with the proposed study areas?

Are the Council and Consultees content that the selection of viewpoints is comprehensive?

Do the Council and Consultees have any information regarding current or recent archaeological work or projects being undertaken within or in the vicinity of the Site, particularly those whose results may not be yet recorded in the Historic Environment Record?

Do the Council and Consultees have details of any additional heritage assets within the vicinity of the Site which it considers may raise significant effects within the EIA process for this Development?

GROUND CONDITIONS AND HYDROLOGY

Introduction

5.186 An assessment of geology, ground conditions, hydrology and hydrogeology will establish the potential hydrological and geological constraints associated with a development at the Site and determine the baseline conditions. This will inform the design and assessments whilst determining any suitable mitigation measures required.

Study Area

5.187 The extent of study area for the ground conditions and hydrology assessment includes the entire Site and extends outwith this due to the nature of these aspects. Geological and hydrological features are natural features they are not bounded by the Site boundary, hence the reason for assessing this wider area.

Assessment

5.188 A desktop study will be undertaken within the Site. The desk study will include an overall appraisal of hydrology and ground conditions for input to the EIA Report chapter. It will also include an initial risk map for the Site, identifying potential or actual constraints, and those areas requiring further consideration.

5.189 The following activities will be undertaken to inform the desktop study:

- Review of published data and maps;
- Consultation with SEPA, EAC, D&G, and the British Geological Survey (BGS) to obtain baseline data;
- Identification of solid and surface geologies;
- Identification of surface water features, catchments and GWDTEs;
- Identification of data on public and private abstractions and supplies, and risk assessment of these; and
- Collation of flood plain information, water quality data and groundwater vulnerability information.

5.190 The information obtained within the desktop study will be ground-truthed and refined via field surveys which will include:

- General site walkover to confirm desktop study information and watercourse crossings;
- Phase 1 and 2 peat probing within accessible areas of the Site to define the peat extent and depth across the Site and inform design.

- 5.191 Peat Probing will consist of two phases, a preliminary phase (Phase 1) and a more detailed phase exercise once the proposed infrastructure has been defined (Phase 2). Phase 1 peat probing would comprise a 100 m x 100 m centres across the proposed scoped turbine layout areas, where access allows. This will be supplemented by Phase 2 peat probe survey works which will focus on the design freeze site layout. Phase 2 peat probing survey will be undertaken at 50 m centres along tracks and at 25 m spacing either side to allow for micro-siting. Peat probing will also be undertaken at 10 m centres at each turbine location.
- 5.192 This approach is in accordance with ECU Scottish Government guidance Peat Landslide Hazard and Risk Assessment: Best Practice Guide for Proposed Electricity Generation Developments (Second Edition). The information gathered will be utilised in preparation of Peat Landslide Hazard and Risk Assessment and outline Peat Management Plan
- 5.193 Should substantial quantities of peat be present within the Site, a Peat Slide Risk Assessment will be undertaken in accordance with ECU Scottish Government guidance 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Second Edition)' April 2017' along with full consultation with the relevant consultees.
- 5.194 The Peat Slide Risk Assessment will comprise of detailed analysis and reporting on the Proposed Development and will include a hazard and slope stability assessment and preliminary peat management recommendations.
- 5.195 The hazards existing on the Site will be ranked based on factors that influence stability, namely peat depth and slope gradient. In addition, potential receptors exposure to risk will be established and hazard rankings applied across the Site, with management and mitigation measures recommended for an acceptable construction.
- 5.196 An outline peat management plan will include high level estimation on peat excavation and re-use volumes. This will be based on the approximate infrastructure dimensions and anticipated re-use streams. This will include;
- Defining the materials that will be excavated as a result of the Proposed Development, focusing specifically on the excavation of peat;
 - Determine volumes of excavated arisings, the cut/fill balance of the Proposed Development and proposals for re-use or reinstatement using excavated materials; and
 - Detail management techniques for handling, storing and depositing peat for reinstatement.
- 5.197 The EIA Report chapter will describe the potential effects of the Proposed Development including:
- Details of consultation undertaken;
 - Assessment methodologies;
 - Field survey details and results;
 - Assessment of the operational and decommissioning phases of the project to establish the effect on the hydrological and geological resource;

- Identify mitigation measures, where necessary;
- Identify any residual effects following mitigation;
- Cumulative assessment with other developments within 10 km of the Proposed Development; and
- Statement of significance in accordance with the EIA Regulations.

5.198 The predicted significance of effects will be determined through a standard method of assessment and based on professional judgement, considering both the sensitivity of receptor and the magnitude of the potential effects.

Matters Scoped Out

5.199 Based on the baseline conditions recorded and distance from the Site, it is proposed that the following are scoped out:

- Designated receptors not hydrologically connected to the Proposed Development, as there is no potential for Hydrological effects on these receptors; and
- Receptors at distances greater than 10 km from the Site boundary, as pollution and sedimentation effects on the water environment beyond this distance is unlikely.

Questions for Consultees

Do the Council and the consultees agree with the proposed methodology and scope of the ground conditions and hydrology assessment?

Does the Council, NatureScot and SEPA or other consultees have any information that would be useful in the preparation of the hydrology assessment?

Do the consultees have any information that would be useful in the preparation of the Ground Conditions assessment, including details of local quarrying activity?

TRAFFIC AND TRANSPORTATION

Introduction

5.200 The Traffic and Transportation chapter will consider the effects of vehicle movements to and from the Site associated with construction, operation and decommissioning phases of the Proposed Development. Vehicle movements to the Site will likely consist of abnormal load vehicles (for the delivery of turbine components), heavy goods vehicles (HGVs), light goods vehicles and cars.

Methodology

5.201 Assessment methodology will follow the 'Guidelines for the Environmental Impact of Road Traffic'. A screening process using two broad rules outlined in the aforementioned guidelines is used to identify the appropriate extent of the assessment area. These include:

- Highway links where traffic will increase by more than 30% (or where the number of HGVs will increase more than 30%); and
 - Any other specifically sensitive areas where traffic flows have increased by 10% or more.
- 5.202 Where the predicted increase in traffic flows is lower than the thresholds, the guidelines suggest the significance of effects can be stated to be low or not significant and further detailed assessments are not warranted. Peak traffic flows will be identified to assess a worst case scenario. Assessment of driver distraction will be undertaken as appropriate.
- 5.203 Traffic movements on the public roads resulting from construction, operation and decommissioning will be based on the Proposed Development design. Traffic generation will take into account the import of construction materials and the export of surplus materials; and the movement of equipment, construction plant and labour required during each phase of the Proposed Development.
- 5.204 Predicted traffic generation associated with any forestry clearance required to accommodate the Proposed Development will be included in the assessment. Only forestry clearance that deviates from ongoing forestry management activities will be considered (i.e. forestry traffic attributable to the Proposed Development).
- 5.205 Peak traffic flows will be identified to assess a worst case scenario. An assessment of effects on road safety, driver delay, pedestrian amenity, severance, noise and vibration will be undertaken as appropriate.
- 5.206 In addition to the aforementioned guidance, the Traffic and Transport chapter will take into account the following statutory guidance documents published by the Scottish Government:
- Scottish Planning Policy;
 - PAN 75 – Planning for Transport; and
 - Scottish Government Planning Specific Advice Sheet for Onshore Wind Turbines (last updated May 2014).
- 5.207 It should be noted that the above list may be subject to change in the case that various policies and guidance are replaced or updated during the delivery of the project.
- 5.208 As Transport Assessments (TA's) principally relate to developments that generate a significant permanent increase in traffic as a direct consequence of function, it is not proposed a formal TA will accompany the application, as wind farms are unlikely to result in any appreciable permanent increase.

Baseline Conditions

- 5.209 An extensive network of major and minor roads traverses the landscape within the 35 km study area. The A70 traverses through the East Ayrshire Lowlands from the west. The A70 runs to the south and west of the Proposed Development.
- 5.210 The roads identified as forming the likely route to Site by abnormal loads and construction traffic are the A76 and C47/U716 Mansfield Road. The A76 runs to the north and north-west of the Proposed Development and forms one of the main

transport routes between Dumfries and Kilmarnock and is subject to high volumes of traffic. The potential traffic and transport effects on these local road networks will be assessed in the EIA Report. An Abnormal Load Assessment will also be presented within the EIA Report.

- 5.211 Baseline traffic flow conditions on routes within the vicinity of the Site will be established and detailed in the EIA. The geographic scope of baseline assessment will be confirmed in consultation with the Council and Transport Scotland as appropriate. This scope is expected to extend to all approach routes to the Site, except where justification for their omission can be demonstrated.
- 5.212 It is proposed that where publicly available traffic count information is available (for example, that provided by the Department for Transport (DfT)), this shall be used for the baseline assessment. Where no such information is available, traffic surveys shall be conducted in accordance with best practice.

Assessment of Effects

- 5.213 The findings of the access route study will be used to identify physical constraints and measures required for appropriate access to the Site.
- 5.214 The study would consider effects on:
- Road Users (delay and safety);
 - Road Infrastructure (dilapidation); and
 - Adjacent community/properties (safety and congestion).
- 5.215 Numerical analyses of delay through network or junction modelling is not considered to be required. The study would consider effects during construction, operation and decommissioning.
- 5.216 Assessing the sensitivity of receptors and magnitude of impacts is based on professional judgement. In terms of road networks, the sensitivity to change in traffic levels of any given road segment or junction is generally assessed by considering the residual capacity of the network under existing conditions. Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic and therefore, the sensitivity is considered low. Conversely, where existing traffic levels are high in comparison to the road capacity, there will be little spare capacity, and the sensitivity to any change in traffic levels would be considered as high.
- 5.217 The magnitude of the impacts will be determined through a review of the outline proposals for the Proposed Development; establishing the parameters of the road traffic that may cause an impact; and quantifying these effects.
- 5.218 To summarise, the assessment would involve:
- Consultation with the relevant roads authorities and emergency services (the Council, Transport Scotland, Police and FCS, etc.);
 - Procurement of existing traffic data, and arranging additional surveys where necessary;

- Route inspections including detailed observations of communities potentially affected by the Proposed Development within the identified study area. The detailed and numeric assessment would be limited to the roads in close proximity to the Site, i.e. from the port of delivery, along the A76 and to the Site entrance;
- Following a route inspection, sensitive receptors would be identified;
- An initial assessment of traffic generation as a result of the Proposed Development would be undertaken. An initial assessment of effects will be based on professional judgement rather than transportation network modelling;
- Obtain refined project needs, refine traffic generation, and re-assess effects, using obtained baseline traffic data;
- Assessment of residual effects following the primary mitigation built in by virtue of the above-mentioned iteration, and any required residual mitigation needs; and
- Identify and assess the potential for cumulative effects based on other known developments in construction or in the planning process.

Matters Scoped Out

- 5.219 Operational traffic to the Proposed Development is expected to be minimal, numbering approximately two vehicle trips per day average. Therefore, the effect of operational traffic will be negligible.
- 5.220 Decommissioning traffic will be less than traffic generated during construction as all below ground infrastructure will be left in place. As this would occur at least 30 years in the future it is not possible to accurately predict baseline traffic flow levels at that time. Prior to undertaking decommissioning an assessment of transport impacts will be undertaken and agreed with the relevant assessing authorities.

Questions for Consultees

Do the Consultees agree with the proposed method of assessment?

Are the Consultees aware of any specific access restrictions or limitations on the proposed abnormal loads route?

Are consultees in agreement that operational and decommissioning traffic can be scoped out?

SOCIO-ECONOMICS, TOURISM, AND RECREATION

Introduction

- 5.221 The Socio-economic, Tourism and Recreation chapter of the EIA Report will bring together related assessments of the likely socio-economic impact of the Proposed Development upon the population, economy and use of the land within and around the Proposed Development. Consideration of sustainable economic development has become a key part of government policy and a key driver in the planning system in recent years. The underlying socio-economic wellbeing of an area is also itself a

driver in terms of population change. The EIA will therefore include a socio-economic assessment to ensure the balance between economic, social and environmental effects can be properly assessed.

Study Area

5.222 The study area for this assessment will be New Cumnock and Cumnock in East Ayrshire as well as Kirkconnel and Kelloholm within Dumfries and Galloway. Given the proximity of communities within both East Ayrshire and Dumfries and Galloway, impacts are likely to occur in relation to settlements within both Local Authorities.

Assessment

5.223 The assessment will include scoping consultation with the relevant stakeholders as well as a desk-based assessment which will assess the following effects:

- Socio-economic effects such as population and employment;
- Tourism effects such as tourist attractions and accommodation; and
- Public Access effects such as core paths, public walkways and cycling networks.

5.224 The desk-based assessment will identify most recent baseline conditions using the most up-to-date government statistics in relation to population, employment and tourism.

5.225 Socio-economic impacts will focus on the effects of the Proposed Development on businesses, employment local and nearby communities. Tourism and public access impacts will focus on any local tourist attractions, tourist accommodation as well as any public access routes, core paths, walkways or cycling routes that may be affected by the Proposed Development.

5.226 When assessing the significance of the effects, consideration is given to the baseline conditions, with the magnitude of impact determined in proportion to the area of impact relevant to each receptor. Significant effects may occur if the Proposed Development resulted in any fundamental or material changes in population, local communities or local economic activity during any or all of the phases of development.

5.227 As with the Consented Lethans Wind Farm, it is expected there will be no significant adverse effects in relation to Socio-Economic, Tourism, and Recreation. However, a desk-based assessment will be conducted in order to ensure the Proposed Development does not have a negative impact with relevant policy and guidance considered. A full assessment will be presented in the EIA Report.

Questions for Consultees

Do Consultees agree with the proposed method of assessment?

Are Consultees aware of any additional sensitive economic activities in the area that would not be covered in the proposed method of assessment?

Are Consultees aware of any key sensitive receptors that might be relevant to likely significant effects? and

OTHER EFFECTS

Introduction

- 5.228 This chapter of the EIA Report will assess the likely impact of the Proposed Development upon receptors surrounding the Site which are not covered in other technical disciplines.
- 5.229 The aim of EIA Scoping is to focus the EIA on those environmental aspects that are considered likely to result in significant environmental effects. In so doing, the significance of effects associated with the Proposed Development becomes more clearly defined. For some topics where significant environmental effects are considered unlikely an assessment of significance will not be undertaken. However, to allow robust decision-making, technical assessments, as detailed below, will be included as Technical Appendices with the planning application and a chapter summarising the assessment findings of the topics outside of the EIA will be provided. This will ensure that the EIA Report remains focused on likely significant effects but the ECU and the statutory consultees know that all issues have been fully addressed.

Shadow Flicker

- 5.230 In relation to Shadow Flicker, under certain combinations of geographical position and time of day, the sun may pass behind the rotors of a wind turbine and cast a shadow over neighbouring properties. Shadow flicker is an effect that can occur when the shadow of a blade passes over a small opening (such as window), briefly reducing the intensity of light within the room, and causing a flickering to be perceived. Shadow flicker effects only occur inside buildings where the blade casts a shadow across an entire window opening.
- 5.231 An assessment of the potential for the Proposed Development to cause shadow flicker effects at the nearest sensitive receptors will be undertaken and if necessary will quantify the level of such effects through modelling based on the specific relationship between the wind turbines and properties along with the characteristics of those properties. A shadow flicker assessment, which will also consider the Consented Lethans Wind Farm, will be included within a technical appendix.
- 5.232 It is unlikely that there will be any Shadow Flicker effects as there are no properties within 10 rotor diameters of a turbine; and therefore, shadow flicker is scoped out of the EIA with a shadow flicker assessment to be included as a technical appendix to the EIA Report.

Telecommunications, Television and Utilities

- 5.233 Wind farms have the potential to interfere with electro-magnetic signals and utilities passing above ground and physically with existing infrastructure below ground. This can therefore potentially affect television reception, fixed telecommunication links and other utilities.
- 5.234 Based upon the Consented Lethans Wind Farm, existing infrastructure constraints are unlikely; however, consultation and a desk-based study will be conducted with relevant telecommunication and utilities providers including:
- Spectrum Licensing (Ofcom);

- Television and telecommunications providers as appropriate; and
 - Water, gas and electricity utilities providers.
- 5.235 A consultation exercise will be completed in order to determine whether any new telecommunication links and utilities have been established since the original assessment and to establish whether an updated baseline is required to inform the assessment.
- 5.236 As part of pre-construction works, a Search Before U Dig query generator will be used to determine potential impacts from the Proposed Development on relevant utility and telecommunication providers, including the following: Power (Scottish Power Network), Gas (Scottish Gas Networks) and Water (Scottish Water) as well as various Telecommunications companies including requests to both the Joint Radio Company Limited and British Telecom).
- 5.237 The Proposed Development will be designed to ensure that there are no effects on telecommunications, television and utilities and, as such, these topics are scoped out of the EIA.

Aviation

- 5.238 The effects of wind turbines on aviation interests have been widely publicised but the primary concern is one of safety. There are two dominant scenarios that may lead to objections from aviation stakeholders:
- Physical Obstruction: Turbines can present a physical obstruction at or close to an airfield or in the military Low Flying environment; and
 - Radar/Air Traffic Services: Turbine clutter appearing on radar display can affect the safe provision of air traffic services as it can mask unidentified aircraft from the air traffic controller and/or prevent them from accurately identifying aircraft under his control.
- 5.239 A detailed Aviation Impact Assessment (AIA) of the Proposed Development will be undertaken and submitted as a technical appendix in order to assess the actual operational impact of the Site and to explore suitable mitigation, as required. In particular the assessment will assess:
- The location, size and potential radar footprint of the Site;
 - Radar Line of Sight analysis and technical impact of the Proposed Development on Primary Surveillance Radar (PSR) systems within range of the Site;
 - Operations at regional airport(s) and how they might conflict with the turbines;
 - Details of the airspace structure in the vicinity and how En-Route flight operations may conflict with the proposed turbines;
 - MOD operations (including low-flying) in the area and how they might conflict with the Proposed Development; and
 - Assessment of applicable mitigation.

- 5.240 Where an actual or potential conflict exists, it is important that an agreed strategy is in place for suitable technical and/or operation mitigation, and that each party can agree a suitable timescale for the implementation of the appropriate solutions. Therefore, consultation with aviation stakeholders will commence to discuss the Proposed Development and define any required mitigation strategy.
- 5.241 Consultation will take place with the CAA and the MoD on their requirements for lighting of the turbines. However, as the turbines are over 150m in height, 2000 candela lights on the nacelle and smaller lights around the towers will be required under CAA regulations. With regard to the MoD the primary concern is likely to be low flying activities and the visibility of the turbines at night. It is considered unlikely significant environmental effects as a result of aviation will result. As such, aviation is scoped out of the EIA although an aviation impact assessment will be provided.
- 5.242 An assessment of the visual effects of aviation lighting located on the turbines will be addressed in the Landscape and Visual Chapter of the EIA Report.

Human Health and Safety

- 5.243 In relation to the provisions within the EIA Regulations, the assessments undertaken within the EIA will consider human receptors such as local residents and construction workers. Therefore, the effects of the Proposed Development in relation to health and population will, where relevant, be considered in the chapters/ technical assessments, such as noise. Given that the effects of the Proposed Development on population and human health will be addressed within the respective chapters / technical assessments, and mitigation measures stated to address any significant adverse effects, a separate health impact assessment is not considered to be necessary and is not proposed.

Major Accidents & Disasters

- 5.244 The EIA Regulations state that an EIA must identify, describe and assess in an appropriate manner, the expected effects deriving from the vulnerability of the Proposed Development to risks, so far as relevant to the Proposed Development, of major accidents and natural disasters.
- 5.245 Throughout all phases of the Proposed Development, cognisance should be made through the following guidance documents produced by Renewable UK:
- Wind Turbine Safety Rules Third Edition;
 - Guidance & Supporting Procedures on the Application of Wind
 - Turbine Safety Rules Third Edition; and
 - Onshore Wind Health & Safety Guidelines.
- 5.246 Health and Safety during the construction and decommissioning phases of the Proposed Development will be subject to relevant legislation and best practice. This will involve site inductions, risk assessments, and method statements as implements by the Construction Environment Management Plan (CEMP). Therefore, there is no further requirement for Health and Safety to be assessed within the EIA and is scoped out of further assessment.

- 5.247 The risk of a major accident could be increased by the probability of natural disasters associated with the location of the Proposed Development.
- 5.248 The Proposed Development is not located within an area known for natural disasters such as floods, hurricanes, tornadoes, volcanic eruptions, earthquakes or tsunamis. As the most probable of natural disasters to affect the Proposed Development, flood risk will be assessed within the hydrological assessment in the EIA Report. It is noted that the Proposed Development is not located in an area prone to flood risk.
- 5.249 None of the identified climate change trends listed will affect the Proposed Development with the exception of increased windstorms. Brake mechanisms installed on turbines allow them to be operated only under specific wind speeds and should severe windstorms be experienced then the turbines would be shut down. Although an unlikely event in the area, the brake mechanisms could also apply to a hurricane scenario.
- 5.250 The Proposed Development is not located within an area prone to such disasters and the likelihood of such an event is extremely rare. Therefore, it is considered that no significant effects will arise due to major accidents and natural disasters as a result of the Proposed Development, and this topic can be scoped out of the EIA.

Climate Change

- 5.251 The Proposed Development will be inherently designed to reduce adverse climate change effects by offsetting the production of carbon dioxide through use of renewable sources for generating electricity. The current baseline with respect to greenhouse gas emissions from existing methods of electricity generation will be identified using existing data from the Government, operational sites, and experience of other similar developments. This information will provide the baseline information against which to assess the contribution of the Proposed Development to reducing greenhouse gas emissions and potential for significant effects. The effects of the Proposed Development on climate change are scoped into the EIA.
- 5.252 It is proposed that the Proposed Development's vulnerabilities and resilience to climate change can be scoped out of the EIA. None of the identified climate change trends listed above could affect the Proposed Development with the exception of increased wind storms. Braking mechanisms installed on turbines allow them to be operated only under specific wind speeds and should severe wind storms be experienced then the turbines would be shut down. Therefore, climate change is not expected to have a significant effect on the Proposed Development, and this topic can be scoped out.
- 5.253 The input values to the Scottish Government Carbon Calculator Tool will be set out and justified. The pages of the Tool itself will be provided as an Appendix to the EIA Report.

Waste

- 5.254 At this stage, the exact quantities and types of waste are unknown. It is expected that they could include:
- Excavated material;
 - Forestry Residues;

- Welfare facility waste;
- Packaging;
- Waste chemicals, fuels and oils;
- Waste metals;
- Waste water from dewatering;
- Waste water from cleaning activities; and
- General construction waste (paper, wood, etc.).

5.255 A Site Waste Management Plan (SWMP) will detail how waste streams are to be managed, following the Waste Hierarchy³⁶ of prevention, reuse, recycle, recover and as a last resort, disposal to landfill. The SWMP will be agreed and implemented prior to construction commencing onsite. Therefore, it is not considered necessary for waste to be assessed further within the EIA and is scoped out for further assessment.

Questions for Consultees

Do you agree that the following elements listed below are unlikely to lead to significant environmental effects and can therefore be considered out with the EIA and 'scoped out'? As such no assessment of significance will be undertaken although a summary of the topic area and any relevant technical assessment will be provided?

Scoped out of EIA	Technical Assessment to be Submitted as a minimum, where required
Shadow Flicker	Shadow Flicker Assessment
Telecommunications, Television and Utilities	None required
Aviation	Aviation Impact Assessment
Human Health and Safety	None required as covered in relevant topic chapters
Major Accidents and Disasters	None required
Climate Change	Carbon Balance Calculator
Waste	None required

FORESTRY

Introduction

5.256 This Chapter of the Scoping Report sets out the approach which would be used to integrate the Proposed Development into the existing woodland structure. A Wind

³⁶ The Waste Management Licencing (Scotland) Regulations 2011 places a duty on all persons who produce, keep or manage waste to apply the 'Waste Hierarchy' in order to minimise waste production at all stages of a development.

Farm Forest Plan would be prepared, which would detail felling and replanting proposals, illustrating the forestry requirements associated with the construction and operation of the Proposed Development.

Methodology

- 5.257 In the UK there is a strong presumption against permanent woodland removal, unless it addresses other environmental concerns or where it would achieve significant and clearly defined additional public benefits. In Scotland, such woodland removal is dealt with under the Scottish Government's Control of Woodland Removal Policy (2009). The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. The assessment will follow the Scottish Government's Control of Woodlands Removal Policy (CoPWR) to calculate and report on the level of permanent woodland removal arising from the Proposed Development.
- 5.258 Forestry does not fit well into the standard EIA methodology. Commercial forests are dynamic and constantly changing through landowner activities, market forces and natural events such as windblow or pest and diseases. The forestry assessment would therefore not be a formal EIA assessment, rather it would be an assessment which describes the changes to the forest structure resulting from the incorporation of the Proposed Development into the forest. This would include the changes to, for example, the woodland composition and felling programmes. The forestry assessment would be presented in an individual EIA Report Chapter. The effects of the Proposed Development relating to forest felling and restocking would be assessed in the relevant chapters of the EIA Report, including Ecology and Nature Conservation, Ornithology, Ground Conditions and Hydrology, etc.
- 5.259 The integration of the Proposed Development into the Forest Plan will be a key part of the development process. Existing forestry tracks will be utilised where possible as well as keyholing to limit felling of forestry outwith the established Forestry Plan.
- 5.260 Where felling is required for the Proposed Development, it will be carried out in accordance with the latest guidance published by Scottish Forestry. Harvesters would be used to fell and process the timber and forwarders will be used to remove them to forest tracks where it is to be loaded onto HGV's for road transport. The branchwood would be used to form brash mats which allow the machinery to traverse the area being felled safely and reduce the impact on the underlying soil.
- 5.261 Due to the risk of soil erosion associated with stump removal on peaty soils on elevated sites, any tree stumps in the areas to be harvested and maintained as tree free would be cut as close as possible to the ground and allowed to remain in-situ and degrade naturally along with the brash as per standard forestry practice for areas reverting to open ground habitats in forests. Only the areas that require physical construction footprint of the Proposed Development will have stumps removed; in which case the stumps would be removed using a purpose-built stump remover, which could be a head-mounted unit on a tracked excavator. The head pulls the stumps out of the ground before splitting and shaking them to remove excess soil. The processed stumps are then stored before being processed through a shredder onsite.

Questions for Consultees

Do the consultees agree with the proposed methodology and scope of the forestry assessment?

Do the consultees have any information, particularly with reference to any new guidance, which should be taken into account within the assessment?

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6. STRUCTURE OF THE EIA REPORT AND PLANNING APPLICATION

6.1 The content of the EIA Report will broadly follow the specifications detailed within Schedule 4 of the EIA Regulations. The EIA Report will consist of three volumes and a Non-Technical Summary (NTS):

- Non-Technical Summary
- Volume 1 - Main EIA Report text;
- Volume 2 - Figures; and
- Volume 3 - Technical appendices.

6.2 Based upon the scope of works presented within this Report, the proposed structure of the EIA Report is set out in Table 6.1.

Table 6.1: Proposed Structure of the EIA Report

Chapter	Summary of Content
Preface	Overview, details of the project team and demonstration of their competency and details of where the planning application can be viewed and structure of the EIAR.
Introduction and Approach to Assessment	Description of the location of the Proposed Development and the Site's characteristics, Site history, overview of the Proposed Development and approach to EIA.
Site Selection and Design Evolution	Approach to site selection and explanation on how the design evolved including a comparison of significant environmental effects between key layouts and the final design.
The Proposed Development	Detailed description of the Proposed Development including details of construction, operational and decommissioning phases.
EIA Topic Specific Chapters	Chapters on the topics that are considered to result in likely significant effects as a result of the Proposed Development.
Other Effects	This chapter will assess the likely impact of the Proposed Development upon receptors surrounding of the Site which are not covered in other technical disciplines.
Synergistic Effects, Schedule of Mitigation, Residual Effects and Conclusions	This section will present the synergistic effects associated with the Proposed Development. It will identify all mitigation, including the mitigation by design that will be undertaken to reduce any adverse effects and summarise the residual effects regarding all of the proposed work in relation to the construction, operation and decommissioning of the Proposed Development.

6.3 In addition, the following will also be prepared to accompany the planning application;

- 'Scoped Out' topics and documents listed in Question 28. A report will be included which provides a summary of the topic areas not considered likely to result in significant environmental effects. For completeness any relevant

technical assessments undertaken for these topics will be included with the planning application but outwith the EIA; and

- A Planning Statement which assesses the level of compliance of the Proposed Development in relation to the Development Plan and other material considerations, including all relevant national policy and guidance.

7. SUMMARY AND CONCLUSIONS

- 7.1 This Scoping Report presents a comprehensive scope of work based on previous experience of the assembled team of specialists and existing knowledge of the Site. The EIA will be undertaken in accordance with The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.
- 7.2 Banks Renewables welcome any comments that the Scottish Government Energy Consents Unit and the consultees have in response to the proposed scope of the forthcoming Lethans Wind Farm Extension application as set out in this report. We would therefore like to formally request a Scoping Opinion of the ECU as to whether the scope and methodology proposed are acceptable.
- 7.3 Through the report a series of questions have been posed to assist agreeing the scope of the forthcoming application as detailed in Table 7.1. Banks Renewables would appreciate a response to these questions.

Table 7.1: Questions for Consultees

Question number	Question
1	Do you agree with the proposed landscape Study Areas?
2	Do you agree with the proposed landscape viewpoint locations?
3	Do you agree with the landscape matters to be scoped out?
4	Do you agree that the proposed scope of the landscape assessment is appropriate?
5	Are there any other wind farms you are aware of within the 20 km study area to be included the cumulative assessment?
6	Do you consider the ornithology survey effort suitable for describing a baseline, when supplemented with modelling to consider future potential impacts of the Proposed Development?
7	Are the stakeholders aware of any other developments which should be considered in the ornithological cumulative assessment?
8	Are Consultees content with the proposed baseline ecology surveys for vegetation, flora, GWDTEs and protected species, and the level of survey effort?
9	Are Consultees content with the proposed approach to the ecological evaluation and impact assessment methods?
10	Are Consultees content with ecological matters scoped out of assessment?
11	Can Consultees provide details or any current or recent ecological records, works or projects within or in the vicinity of the Site, which may not yet be in the public domain?
12	Do consultees agree that vibration, low frequency noise and Amplitude Modulation should be scoped out of the assessment?
13	Do the Council and Consultees agree with the proposed cultural heritage methodology and scope of assessment?
14	Are the Council and Consultees content with the proposed heritage study areas?
15	Are the Council and Consultees content that the selection of heritage viewpoints is comprehensive?
16	Do the Council and Consultees have any information regarding current or recent archaeological work or projects being undertaken within or in the vicinity of the Site,

Question number	Question
	particularly those whose results may not be yet recorded in the Historic Environment Record?
17	Do the Council and Consultees have details of any additional heritage assets within the vicinity of the Site which it considers may raise significant effects within the EIA process for this Proposed Development?
18	Do the Council and the consultees agree with the proposed methodology and scope of the ground conditions and hydrology assessment?
19	Do the Council and the consultees agree with the proposed methodology and scope of the ground conditions and hydrology assessment?
20	Does the Council, NatureScot and SEPA or other consultees have any information that would be useful in the preparation of the hydrology assessment?
21	Do the consultees have any information that would be useful in the preparation of the Ground Conditions assessment, including details of local quarrying activity?
22	Do the Consultees agree with the proposed method of assessment for traffic and transportation?
23	Are the Consultees aware of any specific access restrictions or limitations on the proposed abnormal loads route?
24	Are consultees in agreement that operational and decommissioning traffic can be scoped out?
25	Do Consultees agree with the proposed method of assessment for socio-economics, tourism and recreation?
26	Are Consultees aware of any additional sensitive economic activities in the area that would not be covered in the proposed method of assessment?
27	Are Consultees aware of any key sensitive socio-economic, tourism and recreation receptors that might be relevant to likely significant effects?
28	Are Consultees aware of any additional relevant consultees for socio-economic, tourism and recreation?
29	<p>Do consultees agree that the following can be scoped outwith technical assessments provided where necessary?</p> <ul style="list-style-type: none"> • Shadow flicker though a shadow flicker assessment will be provided as a technical appendix; • Telecommunications, television and utilities; • Aviation though an aviation impact assessment will be provided as a technical appendix; • Human health and safety; • Major accidents and disasters; and • Climate change though the carbon balance calculator will form a technical appendix
30	Do the consultees agree with the proposed methodology and scope of the forestry assessment?
31	Do the consultees have any information, particularly with reference to any new forestry guidance, which should be taken into account within the assessment?