



Vale of Leven Wind Farm Limited

Vale of Leven Wind Farm

Scoping Report

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ABBREVIATIONS

AEP	Annual Exceedance Probability
AIL	abnormal indivisible load
AIP	Aeronautical Information Publication
AM	amplitude modulation
AWI	Ancient Woodland
BoCC	Birds of Conservation Concern
BGS	British Geological Survey
BS	British Standard
CAA	Civil Aviation Authority
CAR	Controlled Activities Regulations
CEMP	construction (or contract) environmental management plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CRAA	collision risk analysis area
dB(A)	decibel (A-weighted), a unit of noise measurement
DECC	Department of Environment and Climate Change
DTM	digital terrain model
DWPA	Drinking Water Protected Area
EclA	ecological impact assessment
ECOW	Ecological Clerk of Works
ECU	Energy Consents Unit of the Scottish Government
EIA	environmental impact assessment
EIAR	environmental impact assessment report
GB	Great Britain
GDL	garden and designed landscapes
GHG	greenhouse gas
GIS	geographic information system
GWDTE	groundwater dependent terrestrial ecosystem
HER	historic environment record
HES	Historic Environment Scotland
HGV	heavy goods vehicle
HMP	Habitat Management Plan
HRA	habitats regulations appraisal
IEF	Important Ecological Features
IEMA	Institute of Environmental Management and Assessment

IOF	Important Ornithological Features
ISA	inner study area
JNCC	Joint Nature Conservation Committee
km	kilometre
LBAP	Local Biodiversity Action Plan
LCA	landscape character area
LCT	landscape character types
LDP	local development plan
LI	Landscape Institute
LiDAR	Light detection and ranging
LLA	Local Landscape Area
LLFT	Loch Lomond Fisheries Trust
LLTNP	Loch Lomond and Trossachs National Park
LVIA	landscape and visual impact assessment
m	metre
MW	megawatt
NBN	National Biodiversity Network
NCV	Nature Conservation Value
NHZ	nature heritage zone
NPF	National Planning Framework
NRTF	National Road Traffic Forecast
NSA	National Scenic Area
NSR	non statutory register
NVC	national vegetation classification
OIA	ornithological impact assessment
OS	ordnance survey
OSA	outer study area
OWPS	Onshore Wind Policy Statement
PAN	planning advice note
PCH	Potential Collision Height
PRA	Preliminary Roost Assessment
PWS	private water supply
RSPB	Royal Society for the Protection of Birds
RVAA	residential visual amenity assessment
SAC	special area of conservation
SEPA	Scottish Environment Protection Agency
SERAD	Scottish Executive Rural Affairs Department



SG	Supplementary Guidance
SNH	Scottish Natural Heritage (now NatureScot)
SPA	special protection area
SPP	Scottish Planning Policy
SSSI	site of special scientific interest
TCPA	Town and Country Planning (Scotland) Act (1997)
UK	United Kingdom
VP	vantage point
VSA	Very Sensitive Area
WDC	West Dunbartonshire Council
WLA	Wild Land Area
ZPSF	Zone of Potential Shadow Flicker
ZTV	zone of theoretical visibility

1. INTRODUCTION

1.1. Background

- 1.1.1. Vale of Leven Wind Farm Limited (“the applicant”) is proposing to submit an application for consent for the development of Vale of Leven Wind Farm (the “Proposed Development”) within the West Dunbartonshire Council (WDC) local authority area. The site is on a large area of open moorland grazing located within the Kilpatrick Hills, northeast of Bonhill, West Dunbartonshire.
- 1.1.2. At this early stage in the design process, it is anticipated the site has the potential to accommodate up to 19 turbines. The applicant has identified class I or IIa turbines with a blade tip height of up to 200 metres (m) as the preferred choice. Each turbine is likely to generate approximately 7 Megawatts (MW) of electricity. The total installed capacity of the Proposed Development is therefore expected to be greater than 50 MW.
- 1.1.3. The Proposed Development is a joint venture between ESB and Coriolis Energy.
- 1.1.4. ESB is Ireland’s premier energy company and is a leading independent power generator in the UK market. ESB has a track record of over 20 years as a successful investor in the UK since commissioning one of the first independent power generation plants at Corby in Northamptonshire in 1994.
- 1.1.5. ESB owns and operates wind farms across the UK and Ireland with a current generating capacity of 600 MW.
- 1.1.6. ESB works in partnership with Coriolis Energy Ltd. Coriolis Energy identifies and works on the development of wind farm proposals and ESB constructs and operates those wind farms.
- 1.1.7. Coriolis Energy is a specialist independent wind farm development company operating throughout the UK. Its principals have been responsible for the development of 300 MW of wind farm projects in the UK. Since its inception, Coriolis has delivered more than 100 MW of operational onshore wind farms, with a further 900 MW in development.
- 1.1.8. The applicant has appointed RSK Environment Ltd (RSK), an experienced environmental consultancy, as lead consultant to carry out an Environmental Impact Assessment (EIA) and related assessments to accompany a Section 36 Application to the Scottish Ministers.

1.2. Requirements of the Legislation

- 1.2.1. Any proposal to construct or operate a power generation scheme with a capacity in excess of 50 MW requires Scottish Ministers’ consent under Section 36 of the Electricity Act 1989.
- 1.2.2. Schedule 9 of the Act places on the applicant a duty to “*have regard to the desirability of preserving the natural beauty of the countryside, of conserving flora, fauna and geological and physiological features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest*”.

- 1.2.3. Under the *Electricity Works (Environmental Impact Assessment) (Scotland) (EIA) Regulations 2017* (as amended) (the “EIA regulations”), the Scottish Ministers are required to consider whether any proposal for a wind farm is likely to have a significant effect on the environment.
- 1.2.4. While not a statutory requirement, as part of the EIA process, the applicant wishes to seek a formal scoping opinion from the Scottish Government Energy Consents Unit (ECU) on behalf of the Scottish Ministers under the EIA regulations.

1.3. The Scoping Process

- 1.3.1. Scoping is undertaken to refine the scope of the assessment of environmental impacts and ensure that it is robust but focused in its approach on potentially significant effects. This will be achieved by inviting the Scottish Ministers and consultees to:
- Specify aspects of the environment and issues relating to these that should be considered and addressed in the EIA (with emphasis on any issues local to the site);
 - Comment on the proposed approach to the EIA;
 - Comment on or recommend, where appropriate, assessment methodologies; and
 - Highlight other relevant bodies or organisations that may have a vested interest in the scheme or be able to provide relevant information.
- 1.3.2. Once the scoping opinion has been received from the ECU, the response will be analysed, and the relevant points raised therein taken forward and used to inform the assessment process.

1.4. Document Structure

- 1.4.1. This document constitutes the Scoping Report and contains the necessary information as required under Part 4 Section 12 of the EIA Regulations. (**Table 1.1**).

Table 1.1: Requirements of Part 4, Section 12(2) of the EIA Regulations

Requirement	Section of Scoping Report
<i>“(a) a description of the location of the development, including a plan sufficient to identify the land;</i>	Section 2.2
<i>“(b) a brief description of the nature and purpose of the development and of its likely significant effects on the environment; and</i>	Section 2.2.4 Section 4
<i>“(c) such other information or representations as the developer may wish to provide or make.”</i>	Section 3 Section 4

- 1.4.2. **Section 5** details the proposed consultation approach for the Proposed Development, including the procedure for making comments in relation to this scoping exercise. **Appendix 1** contains the consultee list containing the statutory and non-statutory stakeholders that will be consulted during the scoping process. **Appendix 2** contains the relevant maps and figures referred to in this Scoping Report.

2. PROJECT DESCRIPTION

2.1. Background

- 2.1.1. This section describes the Proposed Development. A brief description of the site and surroundings is given followed by a description of the components of the scheme. **Figure 2.1** shows the location and boundary of the area under consideration. It should be noted however, that beyond scoping, the design of the development will evolve to take account of constraints and issues raised during scoping, through baseline studies both completed and currently in progress, and through the subsequent iterative assessment of impacts.
- 2.1.2. The Proposed Development is situated at the same location, but with a different access and site boundary, to a previous wind farm proposal, Merkins Wind Farm, which was submitted by the developer (Lomond Energy) as a planning application under the Town and Country Planning Act (1997) (TCPA) in January 2012 and allocated the application reference DC12/028¹. The 10 x 120m to tip Merkins proposal was refused by WDC in 2013. The Proposed Development is a wholly new project with no connection to the Merkins Wind Farm proposal.

2.2. Site Description

- 2.2.1. The site is located within the Kilpatrick Hills, West Dunbartonshire. The nearest settlement to the site is Bonhill which lies approximately 2.5 km to the west of the nearest proposed turbine. The larger settlements of Alexandria and Dumbarton are approximately 4 km to the west and southwest of the site respectively.
- 2.2.2. The land use within the site is dominated by upland moorland suitable for grazing sheep. Dumbarton Muir Site of Special Scientific Interest (SSSI), designated for bog habitats, is located within the eastern section of the site while Auchenreoch Glen SSSI, designated for its lowland calcareous grassland and springs (including flushes), lies within the southwestern section of the site (see Figure 4.2.4a). There are numerous watercourses onsite. Some of the watercourses within the southwestern portion of the site are located within steep gullies.
- 2.2.3. The surrounding land use is predominantly agricultural in the immediate vicinity with some areas of forestry to the west and east. Auchencarroch Landfill Site is located to the west of the site.
- 2.2.4. The Loch Lomond and Trossachs National Park (LLTNP) and the Loch Lomond National Scenic Area (NSA), lie a minimum of 300 m and approximately 2.8 km respectively to the north of the northern site boundary.

2.3. Proposed Development

- 2.3.1. The applicant anticipates the Proposed Development to have a maximum of 19 wind turbines, each of a maximum blade tip height of 200 m. The preliminary turbine layout for the Proposed Development is shown in **Figure 2.2**. The design of the Proposed Development will be informed by the EIA process, and as such is still subject to change.

¹ <https://apps.west-dunbarton.gov.uk/dcdisplayfullx.asp?vUPRN=DC12%2F028&vPassword=&View1=View>

Similarly, the design of the associated infrastructure, as listed at Section 2.3.2, will depend on the turbine layout design, and will also be informed by the EIA process.

Summary of Key Components

2.3.2. The Proposed Development infrastructure will likely include:

- wind turbines and associated infrastructure;
- transformers and underground cables;
- internal and private access road network;
- onsite sub-station/control building;
- permanent anemometry masts;
- site entrance and access track;
- temporary construction compounds;
- borrow pits; and
- energy storage equipment.

2.3.3. It is anticipated that the turbines proposed for the site would have the following physical characteristics (to be confirmed through EIA):

- number of turbines: up to 19;
- height to blade tip: up to 200 m;
- individual turbine generating capacity: likely to be approximately 7 MW; and
- total generating capacity: in excess of 50 MW.

Wind Turbines

2.3.4. Based upon current site information, it is considered that the site can accommodate up to 19 turbines. The final number will be determined by environmental, technical, and commercial constraints identified during the EIA and iterative design process. A maximum blade tip height of 200 m is being considered; however, the final dimensions of each turbine will also be determined as the design process progresses.

2.3.5. The detailed design specification for each foundation would depend on the type of turbine procured, and the specific ground conditions at the location of each turbine.

Permanent Anemometer Masts

2.3.6. The scheme is likely to include permanent anemometer mast(s) located within the site to provide ongoing monitoring of the wind conditions after commissioning of the scheme.

2.3.7. At this early stage it is anticipated that there would be up to three anemometer masts on site, although this would depend on the type of turbine that would be used, the constraints identified during scoping and the iterative assessment.

2.3.8. The selection of the mast will take account of the ease of construction and ability to reduce visual impact. Access to the anemometer mast(s) would likely connect with the main network of site tracks.

Access to Site and Internal Tracks

- 2.3.9. Access to the site for vehicles delivering both construction materials and turbine components, such as tower sections and blades are likely to be from Murroch Farm to the south-west of the site. A new access road would be constructed. The access would be developed to meet the requirements of appropriate guidelines (such as visibility, construction materials, surface water drainage, gradient, and safety of other road users).
- 2.3.10. Tracks used by construction vehicles would be retained throughout the lifetime of the wind farm for use by maintenance vehicles. The width of the tracks would be approximately 6 m, although may be wider for short sections, such as passing places, laydown areas and sharp bends. The surface of the tracks will have a cross fall in order to drain run-off into ditches on the downhill side of the track where necessary, and lateral and cross drains will also be installed where required. Drain outlets would be suitably located with erosion protection as required.

Watercourse Crossings

- 2.3.11. The Water Environment (Miscellaneous) (Scotland) Regulations 2017 came into force from the 1 January 2018. This new legislation will impact the construction industry by requiring a formal Controlled Activities Regulations (CAR) licence to discharge water to the environment for construction sites (such as wind farms) larger than 4 hectares.
- 2.3.12. The number of water crossings required for the Proposed Development would be kept to a minimum. Any new crossings would be designed in accordance with Scottish Government best practice and taking due regard of SEPA guidelines to enable the passage of fish and other wildlife. Any upgrades to existing water crossings that are required would also comply with Scottish Government and SEPA best practice.

Grid Connection, Energy Storage and Operations Control Building

- 2.3.13. Cables from the Proposed Development would be connected to the substation building, which would incorporate the switchgear and metering equipment. In addition to the grid connection equipment, a control and metering room, telecommunications equipment, an office, and welfare facilities for visiting staff would be housed.
- 2.3.14. The connection of the substation to the wider grid network would fall under a separate consenting process and would be subject to a separate environmental investigation and application. Therefore, this will not be considered as part of the EIA for the Proposed Development.
- 2.3.15. In addition to wind farm operation control and connection for export to the grid network, the potential use of equipment and facilities for the storage of electricity will be considered during the design process which will be informed by the EIA. Storage may take the form either of housed or containerised arrays of lithium or other batteries, or potentially other non-battery forms of energy storage technology. The power and energy capacity of such storage would be subject to the final installed capacity of the wind farm element of the Proposed Development and depending on the nature of grid connection secured may be additive to the total generation capacity of the Proposed Development.
- 2.3.16. All power and cabling on site from and between the wind turbines would be buried in trenches located directly adjacent to the internal tracks where possible.

Stone and Aggregate

- 2.3.17. The Proposed Development would require crushed stone to construct new tracks, create hard standing areas for the cranes and lay the turbine foundations. Whether the stone and aggregate would be sourced from on-site borrow pits or delivered to site from external sources will be confirmed during the design process and EIA phase.

Construction Compounds and Work Areas

- 2.3.18. During the construction period, one or more construction compounds would be required that would include laydown areas. The main construction site office and compound would likely comprise temporary cabins to be used for the site offices, the monitoring of incoming vehicles and welfare facilities for site staff including toilets; parking for construction staff, visitors, and construction vehicles; secure storage for tools and small parts; a receiving area for incoming vehicles; and security fencing around the compound.
- 2.3.19. The compounds would be used as a storage area for the various components, fuels and materials required for construction. The major structural components of the turbines would be delivered directly to site. It is anticipated that temporary lay-down areas would be provided for parking and unloading delivery vehicles and abnormal loads.

3. PLANNING POLICY CONTEXT

3.1. Introduction

- 3.1.1. This section presents a summary of relevant policies that will be taken into consideration to help inform the design of the Proposed Development.
- 3.1.2. The Environmental Impact Assessment Report (EIAR) will set out the relevant policies that have been considered as part of the assessments undertaken throughout the EIA. A separate Planning Statement will provide a detailed appraisal of the Proposed Development against the relevant Development Plan policies, national planning policy and other material considerations.
- 3.1.3. The EIAR will also concisely reference climate change policy and the contribution of Proposed Development to the UK and Scottish Government's climate change goals and policy targets.

3.2. National Planning Policy and Guidance

National Planning Framework for Scotland (2014)

- 3.2.1. The National Planning Framework 3 (NPF3) is a long-term strategy for Scotland and is the spatial expression of the Government Economic Strategy and plans for development and investment in infrastructure. The NPF identifies national developments and other strategically important development opportunities in Scotland and is accompanied by an Action Programme.
- 3.2.2. It is important to note that the latest version of NPF, i.e., NPF4, is currently being prepared by the Scottish Government. The draft NPF4 was published in November 2021, and this provides a clear 'direction of travel' for new national level planning policy. It is anticipated that a final NPF4 will be published in Summer 2022. The draft NPF4 is referenced below.

Scottish Planning Policy (2014)

- 3.2.3. Scottish Planning Policy (SPP) sets out national planning policies which reflect the Scottish Ministers' priorities for operation of the planning system and for land use and development. It aims to promote a sustainable place; supporting economic growth, regeneration, and appropriately designed development.
- 3.2.4. The SPP principal policies include a presumption in favour of development that contributes to sustainable development, consideration of renewable energy, sustainable economic development, rural development, historic environment, landscape and natural heritage, transport, flooding and drainage and waste management.

National Planning Framework 4 (2021)

- 3.2.5. The draft NPF4 was published in November 2021. Once approved, it will become part of the statutory Development Plan. Now that the draft document has been published, it is a material consideration, setting out draft policy and is not simply an indication of direction of travel.

- 3.2.6. The draft NPF4 (Part 2, page 44) continues the planning policy approach from the current NPF3 of identifying ‘national development’ which refers to specific land use allocations and also applies national development status to certain classes of development. The draft NPF4 states that *“national developments are significant developments of national importance that will help to deliver our spatial strategy”*.
- 3.2.7. In the draft NPF4 18 national developments are proposed to support the delivery of the Spatial Strategy and it has set out that *“this designation means that the principle of the development does not need to be agreed in later consenting processes, providing more certainty for communities, business and investors”*.
- 3.2.8. There are three categories of national development proposed namely ‘liveable places, productive places and distinctive places.’ Within the ‘productive places’ category is proposed national development 12 entitled ‘strategic renewable electricity generation and transmission infrastructure’.
- 3.2.9. A statement for this national development is provided as follows (page 59):
“This national development supports renewable electricity generation, repowering, and expansion of the electricity grid.
A large increase in electricity generation from renewable sources will be essential for Scotland to meet its net zero emissions targets. Certain types of renewable electricity generation will also be required, alongside developments and increases in storage technology and capacity, to provide the vital services, including flexible response, that a zero-carbon network will require. Generation is for consumption domestically as well as for export to the UK and beyond, with new capacity helping to decarbonise heat, transport, and industrial energy demand. This has the potential to support jobs and business investment, with wider economic benefits.”
- 3.2.10. A statement of ‘need’ is also provided as follows:
“Additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy and supports improved network resilience in rural and island areas.”
- 3.2.11. In terms of designation and classes of development, it is set out that a development within one or more of the classes of development set out in the draft NPF4 and that is of a scale or type that would otherwise have been classified as ‘major’ by the Town and Country Planning (Hierarchy of Development) (Scotland) Regulations 2009 is designated as a national development - these include (page 59):
“Electricity generation, including electricity storage, from renewables of or exceeding 50 megawatts capacity”.
- 3.2.12. The Proposed Development would be well over the national development threshold. The development would make a valuable contribution in supporting the transition to a net zero economy.
- 3.2.13. There is a clear recognition that the planning system must be *“rebalanced”* so that climate change is a primary guiding principle for all plans and decisions. This is an express statement that significant change in the status quo is needed and must be reflected in consenting decisions.

- 3.2.14. The draft NPF4 contains various policies of relevance however given it is in draft form, these may be subject to change. It is expected however that the NPF4 will come into force later in 2022 and will therefore be a key policy consideration for the determination of the Proposed Development.

3.3. Local Planning Policy and Guidance

The Development Plan

- 3.3.1. The statutory Development Plan applicable to the Proposed Development is:
- The Glasgow and the Clyde Valley Strategic Development Plan (“Clydeplan”) (Approved with modification July 2017).
 - The West Dunbartonshire Local Plan (adopted 2010).
- 3.3.2. The West Dunbartonshire Local Development Plan 2 (LDP2) is proposed and has been through Examination. Given the Local Plan pre-dates the current SPP, the focus in the policy appraisal will be on LDP2.
- 3.3.3. As noted, NPF4 when it comes into force, will also form part of the Development Plan.

Clydeplan

- 3.3.4. Section 7 of Clydeplan is entitled ‘City Region as a low carbon place’ – it sets out that delivering a low carbon future in support of the Scottish Government’s ambition to achieve at least an 80% reduction in greenhouse gas (GHG) emissions by 2050 is central to the vision and development strategy of the plan (paragraph 7.3).
- 3.3.5. Policy 10 of Clydeplan states that *“in support of the transition to a low carbon economy and realisation of the Vision and Spatial Development Strategy, support should be given, where appropriate to alternative, renewable technologies and associated infrastructure”*.
- 3.3.6. In terms of onshore wind, the policy states:
- “In order to support onshore wind farms, Local Development Plans should finalise the detailed spatial framework for onshore wind for their areas in accordance with SPP, confirming which scale of development it relates to and the separation distances around settlements. Local Development Plans should also set out the considerations which will apply to proposals for wind energy development, including landscape capacity and impacts on communities and natural heritage. Proposals should accord with the spatial framework set out in Diagram 6 and finalised in Local Development Plans.”*
- 3.3.7. Diagram 6 identifies areas within the city region that are likely to be most appropriate for onshore wind farm development. The methodology used in devising the Onshore Wind Spatial Framework is set out in Part Two of Background Report 10 ‘Low and Zero Carbon Generating Technologies’. At section 15.10, the background report acknowledges that wind turbine development is likely to be acceptable subject to detailed consideration against local policy criteria and that potential wind farm development should not be viewed in isolation. It goes on to state that developers and interested parties must refer to any local guidance made available by the local planning authority including LDPs and supplementary guidance, and landscape capacity studies.
- 3.3.8. Policy 10 requires LDPs to contain finalised detailed spatial frameworks in accordance with SPP and to confirm separation distances around settlements.

3.3.9. Policy 10 also requires LDPs to set out the various considerations that would apply to proposals for wind energy development. In this regard the LDP policy 19 makes specific reference to the requirements listed at paragraph 169 of SPP. The LDP for West Dunbartonshire addresses these considerations and contains a Spatial Framework for onshore wind. The adopted LDP therefore contains the development management policies of relevance for the application.

The West Dunbartonshire LDP2

3.3.10. It is considered that the following key policies of the LDP2 are applicable to the Proposed Development:

- Policy RE1 Renewable Energy Developments;
- Policy RE2 Spatial Framework for Wind Energy;
- Policy RE3 Wind Energy Proposals out with the Spatial Framework.

3.3.11. Other LDP2 policies that will be considered include:

- Policy BE1 Scheduled Monuments and Archaeological Sites;
- Policy BE2 Listed Buildings;
- Policy BE3 Conservation Areas;
- Policy BE4 Gardens and Designed landscapes;
- Policy ENV1 Nature Conservation;
- Policy ENV2 Landscape Character;
- Policy ENV3 Carbon Rich Soils;
- Policy ENV4 Forestry, Trees, and Woodland;
- Policy ENV5 Water Environment;
- Policy ENV8 Air, Light and Noise Pollution;
- Policy CON1 Transportation Requirements for new Developments;
- Policy CON3 Core Paths and Natural Routes.

Renewable Energy Planning Guidance

3.3.12. The Council also has 'Renewable Energy' Planning Guidance in place. This relates to the proposed LDP and is dated November 2016. It is therefore non-statutory at the present time. The Supplementary Guidance (SG) has been produced to underpin the renewable energy policy in the proposed LDP giving guidance on where renewable energy developments are likely to be supported and how proposals will be assessed.

3.3.13. The SG sets out that whilst the adopted Local Plan (2010) will continue to be used in decision making, the SG relates only to the proposed LDP. The SG sets out a Spatial Framework for onshore wind in line with SPP. The SG cross-refers to the Landscape Capacity Study for wind turbine development undertaken for the Glasgow and The Clyde Valley in 2014 and notes it has been carried out at a strategic, regional scale and provides guidance on the areas that are likely to be more suitable for wind energy development. It sets out that applicants should demonstrate an understanding of the sensitivities of the landscape and be able to show how particular proposals respond to and overcome sensitivities, in terms of their site selection and design process. It adds that the Council will use the findings of the Landscape Capacity Study to help assess all applications for wind energy development.

3.4. Climate Change and Energy Policy

- 3.4.1. The burning of fossil fuels to produce electricity is a major contributor to climate change through the release of atmospheric carbon dioxide (CO₂) and other harmful gases known collectively as GHG.
- 3.4.2. 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.
- 3.4.3. The Scottish Government's Energy Strategy (2017) set a target for the equivalent of 50% of the energy for Scotland's heat, transport, and electricity consumption to be supplied from renewable sources. As heat and transport become decarbonised, demand for electricity from renewable sources can be expected to increase.
- 3.4.4. Further deployment of renewable energy generating technology will be required throughout the 2020s in order to meet targets. As a mature technology onshore wind development has a continuing and important role to play, as confirmed by national planning and energy policy and most recently in the draft NPF4.
- 3.4.5. The Scottish Government's Energy Strategy and Onshore Wind Policy Statement (2017) (OWPS) set out *inter alia* that onshore wind is to play a vital role in Scotland's future – helping to substantively decarbonise electricity supplies and the technology is expected to play material role in growing the economy.
- 3.4.6. Scotland's overarching statutory target is to achieve a 100% reduction in GHG emissions to net-zero by 2045, with interim targets of 75% by 2030 and 90% by 2040, now provided for in the Climate Change (Scotland) Act 2009 as amended by the Climate Change (Emissions Reductions Targets) (Scotland) Act 2019 ("2009 Act") which came into force in March 2020.
- 3.4.7. The Scottish Government declared a climate emergency on 14 May 2019. The declaration of an "emergency" is a reflection of both the seriousness of climate change and its potential effects and the need for urgent action to cut carbon dioxide emissions. The declaration is a material consideration which will be referenced.
- 3.4.8. The draft OWPS was published in 2021 and Key points which can be drawn from it include:
- The central requirement for a rapid transition to net zero and the crucial role of further onshore wind development in achieving legally binding targets, especially through the 2020s.
 - Unequivocal Scottish Government policy support for the future role of onshore wind.
 - The urgency of the Climate Emergency and the scale of the necessary ambition – there is express recognition in the draft OWPS of the need for “*meaningful action over the next 12 months*”, “*further and faster*” delivery and that a “*consistently higher rate of onshore wind, and other renewables capacity, will be required year-on-year*”. The scale of deployment required to be operational before 2030 is very considerable and way beyond what has happened in the past.

- The draft OWPS is clear (paragraph 4.4.2) that the “*most cherished landscapes*” must be afforded the necessary protections, but climate change and net-zero require decisive action, and this will inevitably change how Scotland looks. Combatting climate change requires modern and efficient turbines (which paragraph 2.2.3 of the draft OWPS confirms means taller turbines).
- 3.4.9. A large increase in the deployment of this renewable energy technology is supported through a number of UK level policy documents including the latest UK Energy White Paper (2020) and Net Zero Strategy (2021). Scottish Government policy commitments are also clear – most recently expressed in the draft OWPS and in the draft NPF4 which will be material to the energy and national planning policy positions to be considered for the determination of the application.
- 3.4.10. The Proposed Development will clearly make a contribution to the attainment of renewable energy and electricity targets and emissions reduction at both the Scottish and UK levels and the quantification of this contribution would be described.

3.5. Conclusion

- 3.5.1. The EIAR will summarise the renewable energy policy framework, but the detail will be provided in a supporting Planning Statement which will also make reference to key policy documents such as the Scottish Energy Strategy (2017), the forthcoming NPF4 and the Onshore Wind Policy Statement (2017) and its Refresh which was consulted on in late 2021 / early 2022 and which proposes an onshore wind target of an additional 8-12GW of additional onshore wind capacity to be delivered by 2030.

4. ENVIRONMENTAL IMPACT ASSESSMENT SCOPE

4.1. Overall Approach

- 4.1.1. The EIA will be conducted in accordance with the requirements of the EIA regulations. Regulation 4 (1) states that EIA process consists of:
- the preparation of an EIAR by the developer;
 - the carrying out of consultation, publication and notification of the EIAR
 - the examination of the EIAR and any other environmental information by the Scottish ministers;
 - the reasoned conclusion by the Scottish Ministers on the significant effects of the development on the environment; and
 - (e) the integration of the Scottish Ministers' reasoned conclusion into the planning decision notice.
- 4.1.2. The following key stages will form the basis of the preparation of the EIAR:
- Consultation - with statutory and non-statutory bodies and relevant stakeholders;
 - Baseline - establishing a robust baseline of the existing environment on and around the site;
 - Assessment of Environmental Impacts and their Significance - assessment of the environmental impacts and establishing their significance (primarily the assessment of residual effects once mitigation has been adopted); and
 - Development of Mitigation Measures - formulation of mitigation measures to ameliorate the potential impacts of the Proposed Development that cannot practically be avoided through site design.
- 4.1.3. Where, in the professional opinion of the environmental specialists, particular impacts are not predicted to be significant, it is proposed they are scoped out of further assessment. The environmental aspects proposed to be scoped out of the EIA process are outlined in Section 4.3.
- 4.1.4. Following established best practice, it is intended that the design of the Proposed Development will evolve in an iterative manner with the assessment process, led mainly by the consideration of constraints that exist within and around the site (environmental, technical, and economic). Once the preferred design is selected, this will form the basis of the impact assessment.
- 4.1.5. The applicant acknowledges that there is uncertainty regarding the evolving COVID-19 situation and the impact that it might have on this project. The applicant and its supply chain will regularly review their processes and make adjustments to reflect the latest advice from the UK and Scottish Governments. Whenever it is not possible to proceed with the normal approach then the applicant will consult with the relevant stakeholder or consenting authority to find a solution that all parties find agreeable. The applicant takes its commitments under statutory provisions very seriously and will aim to comply with standard practice and guidance where practicable.

Consultation

- 4.1.6. Consultations with relevant authorities, organisations and stakeholders will be undertaken throughout the EIA and site design process, commencing with scoping. The consultations will serve four main purposes:
- to establish a sufficiently robust environmental baseline of the site and its surroundings;
 - to identify, early in the process, specific concerns and issues relating to the site and Proposed Development in order that they can be discussed and accounted for appropriately in the design and assessment; and
 - to ensure appropriate involvement of the public and authorities in the assessment and design process.
- 4.1.7. To fulfil the applicant's obligations under EIA Regulations and S36 of the Electricity Act 1989. The applicant's preferred approach to community consultation would be to hold exhibitions and distribute circulars, in addition to the development of a project website. Due to the uncertainty regarding COVID-19, alternative methods of consultation are being discussed. The implications this might have for public consultation are discussed in Section 5.1. With regards to consultation with other stakeholders and the consenting authorities, the applicant will make every effort to accommodate the needs of the stakeholder and comply with current government advice. The most likely adjustment would be to replace face-to-face meetings with videoconferencing and virtual consultation events. The distribution of circulars would still be completed by the standard means of post and email. The community consultation approach will be reviewed regularly, and this has been factored into the project programme.
- 4.1.8. The details around community consultation will be discussed with the ECU and WDC in due course. The outcome of the consultation process will be compiled into a Statement of Community Consultation ('SoCC') report to accompany the S36 application detailing the consultation undertaken and any changes made to the Proposed Development as a result.

Baseline

- 4.1.9. For each environmental aspect under consideration for the EIA, the environmental baseline of the site and its surroundings will be established (see Section 4.2). This will be achieved through consultation with relevant authorities and organisations, a desktop review of available data including that generated from consultation, and completion of specialist field surveys where required. Relevant information and data already held by the applicant gathered during the pre-application feasibility/screening stage will also be used in the EIA process. There have been preliminary discussions held about how COVID-19 will impact field survey work. The primary focus is to identify control measures that will reduce the risk of COVID-19 to personnel completing field surveys to an appropriate level. Personnel that will be attending site for field surveys will be consulted to ensure that they are comfortable with the control measures and level of risk. The applicant would like to reiterate its commitment to protecting the health and safety of all people associated with the project.
- 4.1.10. The baseline information gathered to date as part of this process will form the basis of assessment and further consultations with the relevant authorities and stakeholders.

Assessment of Environmental Impacts and their Significance

- 4.1.11. The baseline assessments provide the foundation for predicting and assessing effects that may result from the Proposed Development. In accordance with the EIA Regulations, potential environmental effects will be evaluated over the whole lifecycle of the Proposed Development including construction, operation and decommissioning, and their significance determined. Evaluation of significance will use specific criteria for each assessment topic. These will follow best practice guidance where available and will consider the following:
- Compatibility with planning policy and environmental standards;
 - Impact extent and magnitude;
 - Impact nature (whether beneficial or adverse, direct, or indirect, primary, or secondary, permanent, or temporary);
 - Importance and sensitivity of the environmental receptor;
 - The number of receptors that are impacted;
 - Impact duration (whether short, medium, long term and reversible); and
 - Whether it is a standalone impact or is cumulative.
- 4.1.12. Each technical assessment will set out the relevant legislation, policy, and guidance together with scope and methodology used to carry out the assessment of potential effects, including the criteria that are used to establish which effects are significant. The methodology will seek to ensure transparency in the assessment. Each technical assessment will set out the criteria for assessing significance. Where a level of significance is attributed to an effect, this will be based on technical guidance and professional judgement informed by the degree of the effect and consideration of the sensitivity of the receptor.
- 4.1.13. For all environmental aspects, the significance of residual impacts i.e., those predicted once mitigation is taken account of, will form the basis of the assessment. An outline of the proposed methods of assessment for each environmental topic is provided in Section 4.2 onwards.

Development of Mitigation Measures

- 4.1.14. Due to the proposed ‘constraints-led’ iterative evolution of the design for the Proposed Development, most mitigation measures are considered likely to be embedded rather than as ‘add-on’ measures to ameliorate significant environmental effects. The evolution of the design, therefore, will be reported clearly in the EIAR, including the rationale behind the preferred choice of development design.
- 4.1.15. All other measures proposed as mitigation for the Proposed Development will be reported within the relevant section of the EIAR. The mechanism by which these measures will be carried through to implementation on site will also be made clear.

4.2. Environmental Aspects to be Assessed

Background

- 4.2.1. This section identifies the environmental aspects that the applicant proposes to address within the EIA for the Proposed Development. It discusses each aspect in terms of a brief summary of the environmental baseline for each (where practical), the relevant potential

impacts and an overview of the proposed method of assessment for each. Where relevant, the technical areas will be assessed in the context of a defined study area that is informed by industry guidance, best practice, and likely design of the Proposed Development.

Landscape Character and Visual Assessment

Introduction

- 4.2.2. The landscape and visual impact assessment (LVIA) will be prepared and undertaken by landscape architects who have extensive experience of renewable energy projects. This section outlines the range of likely effects of the Proposed Development on the landscape and visual resource and the proposed methodology for the identification, assessment, and reporting of effects.
- 4.2.3. There are four figures associated with this section:
- Figure 4.2.2ai: Landscape Character (20 km radius)
 - Figure 4.2.2aii: Landscape Character Key
 - Figure 4.2.2b: Landscape Designations and Wild Land (20 km radius)
 - Figure 4.2.2c: Principal Visual Receptors (20 km radius)
 - Figure 4.2.2d: Blade Tip (200 m) Zone of Theoretical Visibility and Draft Viewpoints (45 km radius)

Guidance

- 4.2.4. The following sources of guidance will be considered in the LVIA and the presentation of graphics:
- Guidelines for Landscape and Visual Impact Assessment: Third Edition (Landscape Institute and IEMA, 2013) (GLVIA3)
 - Landscape Institute (2019). Visual Representation of Development Proposals: Landscape Institute Technical Guidance Note 06/19
 - Landscape Institute (2019). Technical Guidance Note 2/19 Residential Visual Amenity Assessment
 - NatureScot 2019 digital dataset of landscape character
 - NatureScot (2020). Assessing Impacts on Wild Land Areas Technical Guidance
 - NatureScot (2021). Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments
 - SNH (2010). The special qualities of the National Scenic Areas. Scottish Natural Heritage Commissioned Report No. 374
 - SNH (June 2014). Map of Wild Land Areas
 - SNH (2017). Description of Wild Land Areas
 - SNH (2017). Siting and Designing Wind Farms in the Landscape Version 3a
 - SNH (2017). Visual Representation of Wind Farms, Version 2.2
 - SNH (2018). Working draft Guidance for Assessing the Effects on Special Landscape Qualities
 - SNH and LLTNPA (2010). The special landscape qualities of the Loch Lomond and The Trossachs National Park. Scottish Natural Heritage Commissioned Report, No.376

Existing Baseline Conditions

Landscape Character

- 4.2.5. In 2019, NatureScot created a single digital dataset of landscape character types (LCTs) across Scotland. This is based on the original landscape character assessments that were completed in the 1990s, updated to ensure greater consistency in the approach and structure, to reduce cross-boundary discrepancies, and to make the mapping more accessible and readily legible.
- 4.2.6. Guidance on the NatureScot web page advises that topic-specific capacity studies should take precedence over the 2019 NatureScot dataset where relevant to specific types of development, such as wind farms. However, the WDC area, including the Proposed Development site, is not covered by a topic-specific capacity study for wind energy development, and the 2019 NatureScot dataset has therefore been used for the West Dunbartonshire area. Other parts of the study area are covered by capacity studies, and these will be referenced in the LVIA where relevant.
- 4.2.7. The landscape character of the 20 km study area is shown on Figure 4.22ai (with a key to landscape character types shown on Figure 4.22aii). This shows that the site is entirely within the area classified as Rugged Moorland Hills (LCT 216) in the NatureScot dataset. This is an extensive LCT that is described by NatureScot as having the following key characteristics:
- *“Large-scale simple landscape.*
 - *Distinctive upland character created by the combination of elevation, exposure, rugged landform, including a fault line and cliffs, moorland vegetation and the predominant lack of modern development, emphasised by the proximity to low-lying valleys and coastal areas.*
 - *Undeveloped skylines and striking views to the Glasgow conurbation.*
 - *Extensive man-made reservoirs and smaller natural lochs.*
 - *Important backdrop to neighbouring settled landscapes, creating a unique sense of place.*
 - *Sparse settlement and predominant lack of modern development.*
 - *Presence of archaeological sites on hilltops and sides, and on lower ground.*
 - *Sense of apparent naturalness, wild character and remoteness which contrasts strongly with the farmed and developed lowland areas.*
 - *Diversity of landscape experience.”*
- 4.2.8. The LVIA will include an assessment of the effects of the Proposed Development on the relevant LCTs within the study area.

Landscape Planning Designations

- 4.2.9. Landscape planning designations are shown on Figure 4.22b out to a radius of 20 km.
- 4.2.10. The site area is not covered by any national landscape designations that are intended to protect landscape quality. There are, however, nationally designated areas in the 45 km study area, including the LLTNP and the Loch Lomond National Scenic Area (NSA), which lie a minimum of 300 m and approximately 2.8 km respectively to the north of the northern site boundary.

- 4.2.11. The closest Garden and Designed Landscape (GDL) is Overtoun House GDL, a minimum of just under 1 km to the south of the southern site boundary, while the Antonine Wall World Heritage Site lies a minimum of approximately 2.3 km to the south of the southern site boundary.
- 4.2.12. The site is covered by the regional designation of the Kilpatrick Hills Local Landscape Area (LLA), as identified by WDC. This LLA also extends eastwards across the boundary into the East Dunbartonshire and Stirling Council areas
- 4.2.13. Other regional designations in the study area include the Stirling Council Southern Hills LLA, a minimum of approximately 7 km away to the east, and Argyll and Bute Loch Lomond Area of Panoramic Quality (APQ), a minimum of approximately 10 km to the north-west of the site boundary.
- 4.2.14. Potential effects on relevant designated areas will be considered in the LVIA.

Wild Land

- 4.2.15. The closest Wild Land Area (WLA) to the Proposed Development is WLA 04 Waterhead Moor – Muirshiel, which lies a minimum of approximately 18 km to the south-west of the Proposed Development (see Figure 4.22b). While the Proposed Development is very unlikely to have potential for a significant effect on the wild land qualities of this WLA, this will be reviewed once the layout of the Proposed Development has been finalised and, if required, the scope of any assessment will be discussed with statutory consultees. Visual Baseline
- 4.2.16. The LVIA will undertake an assessment of the visual effects arising from the Proposed Development through consideration of the effects it will have on views from a series of representative viewpoints as well as wider effects on visual amenity in relation to a range of principal visual receptors, including settlements, routes, visitor destinations and other relevant locations. These are shown on Figure 4.22c.
- 4.2.17. The principal visual receptors are likely to include (but are not restricted to) the following:
- **Settlements/built-up areas:** Alexandria, Balfron, Balloch, Balmaha, Bearsden, Bonhill, Clydebank, Croftamie, Drymen, Dumbarton, Erskine, Gartocharn Killearn, Luss, Milngavie, Milton of Buchanan, and Port Glasgow;
 - **Recreational routes:** John Muir Way, Scottish National Trail, Three Lochs Way, West Highland Way, core paths and local tracks in the Kilpatrick Hills, National Cycle Network routes 7 and 75, waterborne routes on Loch Lomond;
 - **Roads:** A82, A811, A81, A817, A875, B837; and
 - **Hilltops:** Ben Bowie, Ben Ledi, Ben Lomond, Conic Hill, Doughnot Hill, Dumgoyne Hill, Duncryne Hill, The Whangie.
- 4.2.18. A preliminary viewpoint list is shown in **Table 4.1**. Final viewpoint locations will be dependent on the visibility of the final application layout of the Proposed Development and will be established through fieldwork, the scoping process and in agreement with WDC, LLTNPA and NatureScot.
- 4.2.19. The preliminary viewpoints have been selected to represent sensitive landscape and visual receptors that are shown to gain visibility of the scoping layout of the Proposed Development and take consideration of viewpoints used in the LVIA's for other relevant wind farm development (including the previously proposed Merkin's wind farm, which was

on the same site as the Proposed Development). These viewpoint locations are shown on Figure 4.22d.

Table 4.1: Preliminary Viewpoint Locations

Viewpoint Location	Approx. Grid Reference	Approx. Distance to Nearest Turbine (Scoping Layout)	Reason for Inclusion
1. Doughnot Hill	244735-677714	1.13 km	High point within the Kilpatrick Hills at close proximity to the site, visited by recreational receptors. Within the Kilpatrick Hills LLA.
2. Blairquhanan	242100-683100	1.88 km	View gained by residential receptors, within LLTNP. Also, on/close to John Muir Way, core path, and NCN 7.
3. A82 Roundabout Near Bellsmyre	239800-676800	3.68 km	View from the A82 on the western edge of Dumbarton.
4. A811 and Old Luss Road Roundabout	238600-681600	4.35 km	View from the A811 in Alexandria/Balloch. Just within LLTNP (this road forms the Park boundary) and the view will be gained by people arriving at/leaving LLTNP.
5. The Whangie	249100-680500	3.89 km	Hilltop viewpoint accessed by core path and popular with recreational users. Within the Kirkpatrick Hills LLA.
6. Duncryne Hill ('The Dumpling')	243500-685900	4.22 km	Popular local high point with car parking and accessed by core path. Within LLTNP.
7. Dumbarton Rock	239900-674500	5.16 km	Elevated viewpoint that is recognised on OS mapping, accessed by steps, and near Dumbarton Castle.
8. Drymen	248400-687900	7.26 km	Viewpoint on the edge of Drymen, within LLTNP and on the West Highland Way.
9. Ben Bowie	234000-682900	9.13 km	Hilltop viewpoint just within LLTNP and Loch Lomond NSA, accessed by a path. The John Muir Way and Three Lochs Way pass nearby.
10. Dumgoyne Hill	254100-682700	8.91 km	Popular local high point accessed by core path. Within Southern Hills LLA.
11. Balmaha Harbour	241500-690700	9.29 km	Public viewpoint adjacent to Balmaha Harbour, on the West Highland Way. Within the LLTNP and Loch Lomond NSA.

Viewpoint Location	Approx. Grid Reference	Approx. Distance to Nearest Turbine (Scoping Layout)	Reason for Inclusion
12. Port Glasgow, Kilmacolm Road (A761)	233500-673900	10.57 km	View from the A861 in Port Glasgow, included to represent residential viewers. Also, a core path.
13. Bat Charchel ^a	249000-692000	11.29 km	Elevated viewpoint near a transmission mast on a minor road (also West Highland Way, NCN 7 and a core path). Within LLTNP.
14. Balfron	254600-689900	12.64 km	Viewpoint on the A875 to the north of Balfron.
15. Luss	236000-693100	13.59 km	Viewpoint on the shoreline of Loch Lomond at Luss. Within LLTNP and Loch Lomond NSA.
16. Lyle Hill, Greenock	225685-677111	17.19 km	Elevated viewpoint that is recognised on OS mapping.
17. Misty Law	229608-662004	21.38 km	A popular walking destination and the highest point in the Clyde Muirshiel Regional Park. On a recognised walking route. Within WLA 04 Waterhead Moor – Muirshiel and on the edge of an SLA.
18. Ben Lomond	236700-702800	22.20 km	Very popular hilltop for recreational receptors. Within the LLTNP and Loch Lomond NSA and accessed by a core path.
19. Dunoon	218200-677700	24.61 km	Viewpoint on the waterfront in the town of Dunoon, on a core path.
20. Ben Ledi	256200-709700	13.39 km	Popular hilltop for recreational receptors. Within the LLTNP and WLA 07 Ben More - Ben Ledi and accessed by a core path.

4.2.20. Visualisations and figures will be produced to NatureScot standards as set out in 'Visual Representation of Wind farms: Version 2.2' (SNH, February 2017).

Potentially Significant Effects

4.2.21. The LVIA is intended to determine the likely significant effects that the Proposed Development will have on the landscape and visual resource. Five categories of potential effects on the landscape and visual resource are considered:

- Physical effects on landscape elements;
- Effects on landscape character;
- Effects on wild land;
- Effects on views (including night-time effects of visible aviation lighting on wind turbines); and

- Cumulative effects.

4.2.22. Effects in these five categories may arise from the various elements of the Proposed Development, including the turbines and associated infrastructure (e.g., access tracks, substation, compounds, hardstandings, borrow pits, and anemometer mast).

Physical Effects on Landscape Elements

4.2.23. Physical effects are restricted to the area within the Proposed Development site boundary and are the direct effects on the existing fabric of the site, such as the removal of forestry and alteration to or reinstatement of ground cover. This category of effects is made up of landscape elements, which are the components of the landscape, such as moorland, which may be directly and physically affected by the Proposed Development.

Effects on Landscape Character

4.2.24. Landscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and the way that this pattern is perceived. Effects on landscape character arise either through the introduction of new elements that physically alter this pattern of elements, or through visibility of the Proposed Development, which may alter the way in which the pattern of elements is perceived. This category of effects is made up of landscape character receptors, which fall into two groups; landscape character types (LCTs) and landscape-related designated areas.

Effects on Wild Land Areas

4.2.25. The assessment of the effects on the 'wild land qualities' of Wild Land Areas (WLAs) is carried out through consideration of impacts on the physical attributes and perceptual responses of relevant WLA(s). The assessment of effects on WLAs is carried out in accordance with NatureScot guidance (Assessing Impacts on Wild Land Areas Technical Guidance, 2020) which provides a prescriptive methodology.

Effects on Views

4.2.26. The assessment of effects on views is an assessment of how the introduction of the Proposed Development will affect views throughout the study area. The assessment of effects on views is carried out in three parts:

- An assessment of the effects that the Proposed Development will have on a series of viewpoints;
- An assessment of the effects that the Proposed Development will have on views from principal visual receptors, which include relevant settlements and routes throughout the study area; and
- An assessment of the potential night-time effects of visible aviation lighting.

Cumulative Effects

4.2.27. Cumulative effects arise where the study areas for two or more wind farms overlap so that both of the wind farms are experienced at proximity where they may have a greater incremental effect, or where wind farms may combine to have a sequential effect, irrespective of overlap in study areas.

Proposed Assessment Methodology and Consultation

Study Area

- 4.2.28. A study area with a radius of 45 km from the nearest wind turbine in the Proposed Development will be utilised in the LVIA, and mapping of the various characteristics and features of the study area that are relevant to the assessment (i.e., landscape character types and landscape-related planning designations) will be presented in the LVIA to a 45 km radius. This information will also be presented in the LVIA with a 20 km study area in order that the local context can also be clearly seen, and it is likely that the written assessment will focus on the area within a 20 km radius.

Significance of Effects

- 4.2.29. The objective of the assessment of the Proposed Development is to predict its likely significant effects on the landscape and visual resource. In accordance with the EIA regulations, the LVIA effects are assessed to be either significant or not significant. The LVIA does not define intermediate levels of significance as the EIA Regulations do not provide for these.
- 4.2.30. The significance of effects is assessed through a combination of two considerations; the sensitivity of the landscape or visual receptor and the magnitude of change that will result from the addition of the Proposed Development. While this methodology is not reliant on the use of a matrix to arrive at the conclusion of a significant or not significant effect, a matrix is included (see **Table 4.2**) to illustrate how combinations of sensitivity and magnitude of change ratings can give rise to significant effects. The matrix also gives an understanding of the threshold at which significant effects may arise.

Table 4.2: Illustrative significance matrix

		Magnitude of change					
		High	Medium-High	Medium	Medium-Low	Low	Negligible
Sensitivity	High	Major (Significant)	Major (Significant)	Major/moderate (Significant)	Moderate (Significant/Not Significant)	Moderate/minor (Not Significant)	Minor (Not Significant)
	Medium-High	Major (Significant)	Major/moderate (Significant)	Moderate (Significant/Not Significant)	Moderate (Significant/Not Significant)	Moderate/minor (Not Significant)	Minor (Not Significant)
	Medium	Major/moderate (Significant)	Moderate (Significant/Not Significant)	Moderate (Significant/Not Significant)	Moderate/minor (Not Significant)	Minor (Not Significant)	Minor (Not Significant)
	Medium-Low	Moderate (Significant/Not Significant)	Moderate (Significant/Not Significant)	Moderate/minor (Not Significant)	Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)
	Low	Moderate (Significant/Not Significant)	Moderate/minor (Not Significant)	Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)

4.2.31. Effects within the dark grey boxes in the matrix are considered to be significant. Effects within the light grey boxes may be significant or not significant depending on the specific relevant factors that arise at a particular landscape or visual receptor. In accordance with GLVIA3, experienced professional judgement is applied to the assessment of all effects and reasoned justification is presented in respect of the findings of each case.

4.2.32. A significant effect occurs where the Proposed Development will provide a defining influence on a landscape element, landscape character receptor or view. A not significant effect occurs where the effect of the Proposed Development is not material, and the baseline characteristics of the landscape element, landscape character receptor, view or visual receptor continue to provide the definitive influence. In this instance the Proposed Development may have an influence, but this influence will not be definitive.

Sensitivity

4.2.33. Sensitivity is an expression of the ability of a landscape receptor or view to accommodate the Proposed Development and is determined through a combination of the value of the receptor and its susceptibility to the Proposed Development.

4.2.34. Levels of sensitivity (high, medium, and low) are applied in order that the judgement used in the process of assessment is apparent. Intermediate levels (medium-high and medium-low) may also be applied where the particular combination of value and susceptibility results in an intermediate definition.

Magnitude of Change

- 4.2.35. Magnitude of change is an expression of the extent of the effect on landscape and visual receptors that will result from the introduction of the Proposed Development. The magnitude of change is assessed in terms of a number of variables, including the size and scale of the impact and the extent of the affected area.
- 4.2.36. Levels of magnitude of change (high, medium, low, and negligible) are applied in order that the judgement used in the process of assessment is apparent. Intermediate levels (medium-high and medium-low) may also be applied where the particular combination of variables results in an intermediate definition.

Cumulative Assessment

- 4.2.37. The objective of the assessment of cumulative effects is to assess the ways in which the Proposed Development will interact with other relevant existing, consented, or proposed wind farms. The cumulative assessment will be carried out in accordance with NatureScot Guidance 'Assessing the cumulative landscape and visual impact of onshore wind energy developments' (2021), and will include potential sequential cumulative effects on routes, including roads and other routes, as well as cumulative effects on static receptors and viewpoints.
- 4.2.38. The wind farms to be considered in the cumulative assessment will be agreed with WDC and NatureScot with a 'cut-off date' prior to the production of the LVIA. These will include operational, under-construction, consented and application/appeal stage wind farm; scoping-stage wind farms are not included unless there are exceptional reasons for doing so. Single turbines and those that are less than 50 m to tip will not be included in the cumulative assessment.
- 4.2.39. In accordance with NatureScot guidance, the cumulative assessment will commence with a 60 km radius search area. This will then be reduced as appropriate for the detailed cumulative assessment, in agreement with WDC and NatureScot.
- 4.2.40. The LVIA will assess the incremental effect arising from the addition of the Proposed Development to the cumulative situation, in accordance with GLVIA3, which notes (para 7.18):
- "Some of those involved may tend to favour a limited view focussed on the additional effects of the project being assessed, on top of the cumulative baseline. Some stakeholders may however be more interested in the combined effects of all the past, present and future proposals, including the proposed scheme...Assessing combined effects of different proposals at different stages in the planning process can be very complex. Furthermore, the assessor will not have assessed the other schemes and cannot therefore make a fully informed judgement. A more comprehensive overview of the cumulative effects must rest with the competent authority."*
- 4.2.41. Significant cumulative landscape or visual effects arise where a 'wind farm landscape' is created as a result of the addition of the Proposed Development to other existing or proposed wind farms, resulting in wind turbines becoming sufficiently prolific that they become a prevailing or key landscape and visual characteristic.

Nature of Effects

- 4.2.42. The 'nature of effects' relates to whether the effects of the Proposed Development are positive (beneficial) or negative (adverse). The landscape and visual effects of wind farms are difficult to categorise in either of these brackets as, unlike other disciplines, there are no definitive criteria by which effects can be measured as being categorically positive or negative.
- 4.2.43. The LVIA will adopt a precautionary approach, which assumes that significant landscape and visual effects will be weighed on the negative side of the planning balance, although positive or neutral effects may arise in certain situations.

Assessment of Night-time Visual Effects

- 4.2.44. The Civil Aviation Authority (CAA) requires that 'en-route obstacles' at or above 150 m above ground level are lit with visible lighting to assist their detection by aircraft. As the turbines in the Proposed Development are currently proposed to have a 200 m tip height, there will be a requirement for some or all of these turbines to display visible red lights at night and a night-time assessment of effects will therefore be required. The lights will be placed on the nacelles of the turbines.
- 4.2.45. The assessment of turbine lighting is intended to determine the likely effects that the Proposed Development will have on the visual resource e.g., it is an assessment of the effects of visible aviation lighting on views experienced by people at night. The assessment of visible lighting is solely a visual effect and does not consider effects of aviation lighting on landscape character. This is because the lighting will not be activated at times when there is a clear perception of landscape character, during daylight hours, and will also not affect the physical pattern of elements that constitutes landscape character.
- 4.2.46. The assessment of night-time effects will be informed by a ZTV of the turbine lights and night-time visualisations from three viewpoints, to be agreed with WDC and NatureScot, that illustrate the proposed lighting effects. These viewpoints will represent locations from where people are most likely to experience the Proposed Development at night.

Residential Visual Amenity Assessment

- 4.2.47. A Residential Visual Amenity Assessment (RVAA) will be carried out in accordance with Landscape Institute Technical Guidance Note 2/19 Residential Visual Amenity Assessment (2019). In accordance with the guidance, this will include an assessment of effects on the views gained by properties that lie within a 2 km radius of the nearest turbine in the Proposed Development. This does not form part of the LVIA and will be presented as a separate appendix.

Approach to Mitigation

- 4.2.48. The layout design of the Proposed Development is a vital part of the EIA process and is the stage where the biggest contribution can be made to mitigate potential landscape and visual effects, creating a wind farm which is appropriate for the existing landscape character and visual features of an area. Landscape and visual objectives will be considered in the wind farm design from an early stage, along with environmental constraints, technical and economic factors, and will be incorporated through the iterative design process in order to prevent or reduce potential adverse landscape and visual

effects. Embedded landscape and visual mitigation measures will be described in the EIAR.

Questions for Consultees

- Do the Council and Consultees agree with the proposed methodology and scope of assessment?
- Are the Council and Consultees content with the proposed preliminary Study Area (45 km radius)?
- Do the Council and Consultees agree with the proposed list of viewpoints as listed in **Table 4.1** and illustrated on Figure 4.22d?

Cultural Heritage and Archaeology

Introduction

- 4.2.49. The cultural heritage section of the EIAR will characterise the historic environment within the site and in the wider study area. Consultation, desk-based research including LIDAR assessment and walkover surveys, a zone of theoretical visibility (ZTV) and setting visits will be used to define proportionate study areas for the assessment. A baseline of designated and non-designated heritage assets will be assembled to assess the potential direct, indirect, and setting effects of the Proposed Development. Where likely significant effects are identified, mitigation measures will be identified.
- 4.2.50. The cultural heritage of an area comprises archaeological sites, historic buildings, gardens and designed landscapes, historic battlefields and other sites, features or places in the landscape that have the capacity to provide information about past human activity, or which have cultural relevance due to associations with folklore or historic events. Sites of cultural heritage interest may also derive some, or all, of that interest from their setting within the wider landscape. The cultural heritage section of this EIA Scoping Report is thus intended to identify likely significant effects of the Proposed Development upon the physical fabric and settings of heritage assets within the site, and likely significant effects on the cultural significance of assets within the wider landscape through development within their setting, which would need detailed consideration through EIA.
- 4.2.51. Direct physical effects involve physical alteration or destruction of heritage assets and could result from the construction of turbine and crane bases, new or upgraded access tracks, substations, transformers, cables etc.
- 4.2.52. Effects on the setting of heritage assets can arise due to the relative scale of turbines, their potential to detract from understanding of key views from/towards an asset, or a change resulting in an adverse experience of a heritage asset.
- 4.2.53. Cultural significance is a quality that applies to all heritage assets and as defined by Historic Environment Scotland (HES) (NatureScot & HES 2018, Appendix 1 page 175), relates to the ways in which a heritage asset is valued both by specialists and the general public; it may derive from factors including the asset's fabric, setting, context and associations. Following 'Scottish Planning Policy' paragraph 137, the analysis of a heritage asset's cultural significance aims to identify its 'special characteristics' which should be protected, conserved, or enhanced. Such characteristics may include elements of the asset's setting, which is defined in Historic Environment Scotland's guidance as "*the way in which the surroundings of a historic asset or place contribute to how it is experienced, understood and appreciated*" (HES 2016, updated 2020, Section 1).

- 4.2.54. This use of the word cultural ‘significance’, referring to the range of cultural values or interest attached to an asset, should not be confused with the unrelated usage in EIA where the ‘significance of an effect’ reflects the weight that should be attached to it in a planning decision.
- 4.2.55. Historic landscape is not treated as a heritage asset for the purposes of this assessment except where a defined area of landscape has been designated for its cultural heritage interest (including Conservation Areas and areas included in the Inventory of Gardens and Designed Landscapes). It is recognised that all landscapes have a historic dimension, and this will be considered as part of the assessment of Landscape Character (covered in the LVIA chapter of the EIAR). Further, although any effects on the cultural significance and importance of heritage assets due to change in their setting are likely to be visual in nature, the assessment of these visual effects is distinct from the assessment of visual change in the LVIA. The assessment of effects on setting may be informed by visualisations prepared as part of the LVIA but the conclusions reached regarding visual change in the setting of a heritage asset are distinct.
- 4.2.56. There are four figures associated with this section:
 Figure 4.2.3a: Known heritage assets within the Inner Study Area (ISA)
 Figure 4.2.3b: Designated heritage assets in the Outer Study Area (OSA)
- 4.2.57.

Guidance

- 4.2.58. It is proposed that the EIA will be carried out with reference to the following legislation, policy and guidance:

Legislation:

- The Ancient Monuments and Archaeological Areas Act 1979;
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997;
- The Historic Environment Scotland Act 2014.

Policy:

- Scottish Planning Policy (SPP) 2014, and amendment 2020);

Guidance:

- Historic Environment Scotland Circular (HES, 2019).
- Planning Advice Note (PAN) 2/2011: Planning and Archaeology;
- IEMA/CIfA/IHBC Principles of Cultural Heritage Impact Assessment in the UK (2021);
- Designation Policy and Selection Guidance, (HES 2019)
- Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists (CIfA 2020);
- Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CIfA 2020);
- Managing Change in the Historic Environment: Setting (Historic Environment Scotland (HES) 2016, updated 2020);

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

Existing Baseline Conditions

Study Area

- 4.2.59. Overlapping study areas are proposed for the identification of heritage assets that may be affected by the Proposed Development.
- 4.2.60. The Inner Study Area (ISA) corresponds to the extent of the site (Figure 4.2.3a).
- 4.2.61. Heritage assets included within the Outer Study Area (OSA) will be identified in the EIA Report based on a bare earth ZTV to identify assets beyond the site that may be affected through development within their setting.
- 4.2.62. Within the site boundary, all known and potential heritage assets will be assessed for potential direct, setting, and indirect effects.
- 4.2.63. Within the OSA, assets will be included in the assessment based on the level of importance assigned to the asset to ensure that all likely significant effects are recognised:
- Up to 2 km from the proposed turbines: Category C Listed Buildings and all non-designated heritage assets.
 - Up to 5 km from the proposed turbines: Category B Listed Buildings and Conservation Areas.
 - Up to 10 km from the proposed turbines: all assets of national importance, including Scheduled Monuments, Category A Listed Buildings, Inventory Gardens and Designed Landscapes, Inventory Historic Battlefields, and non-designated heritage assets shown on WoSAS's non statutory register (NSR) as of national importance.
 - Beyond 10 km from the proposed turbines: World Heritage Sites and any asset that is considered exceptionally important, and where long-distance views from or towards the asset are thought to be particularly sensitive, in the opinion of the assessor or relevant consultees.
- 4.2.64. Within the OSA, assets will be included in the assessment based on the level of importance assigned to the asset (defined in the EIA Report Methodology), to ensure that all likely significant effects are recognised (see Figure 4.2.3b).
- 4.2.65. The baseline will be screened (and agreed with relevant consultees) to identify any assets of particular sensitivity or importance. Criteria for the identification of assets of particular sensitivity or importance will be based on the approach set out in Managing Change in the Historic Environment: Setting (Historic Environment Scotland, 2016, updated 2020) that sets out a range of factors which might form part of the setting of a heritage asset as follows:
- *“Current landscape or townscape context;*
 - *Views to, from and across or beyond the historic asset or place;*
 - *Key vistas: for instance, a ‘frame’ of trees, buildings or natural features that give the historic asset or place a context, whether intentional or not);*

- *The prominence of the historic asset or place in views throughout the surrounding area, bearing in mind that sites need not be visually prominent to have a setting;*
- *Aesthetic qualities;*
- *Character of the surrounding landscape;*
- *General and specific views including foregrounds and backdrops;*
- *Views from within an asset outwards over key elements in the surrounding landscape, such as the view from the principal room of a house, or from a roof terrace;*
- *Relationships with other features, both built and natural;*
- *Non-visual factors such as historical, artistic, literary, place name, or scenic associations, intellectual relationships (e.g., to a theory, plan, or design), or sensory factors; and*
- *A ‘sense of place’: the overall experience of an asset which may combine some of the above factors.”*

Preliminary Environmental Baseline

- 4.2.66. The baseline information used for this EIA Scoping Report has been compiled using existing data on the historic environment:
- HES designations data available as Geographical Information Systems (GIS) datasets;
 - West Dunbartonshire Historic Environment Record (HER) data provided digitally in January 2022 by the West of Scotland Archaeology Service (WoSAS);
 - Stirling Council Historic Environment Record (HER) data provided digitally in January 2022 by the Stirling Council Archaeology Service;
 - National Record of the Historic Environment comprising the Canmore database.

Site Boundary

- 4.2.67. There are no designated heritage assets located within the site boundary. There are 70 known non-designated heritage assets within the site boundary. Prehistoric activity is represented by a flint flake findspot, a cup-marked stone and three possible prehistoric cairns. The most frequent site type however relates to former lime working within the site as the locations of 13 lime kilns are known, predominantly within the valley of Murroch Burn. Also relating to former industry are the sites of five quarries and four millstones. Relating to later historic period agricultural exploitation of the site, there are five shielings, four enclosures, five farms/buildings, and nine areas of rig and furrow earthworks. In the southeast of the site are military remains comprising a ‘starfish’ decoy site, along with two associated bomb craters. Across the site there are the remains of eight roads/tracks. Finally, there are five undated mounds, a still and an area of peat cutting.

Outer Study Area

- 4.2.68. Designated assets within 2 km of the site comprise two scheduled monuments, both prehistoric cairns. Of a further 42 non-designated assets within 2 km of the site, those whose wider landscape setting contributes substantially to their cultural significance will be identified during the course of the EIA. There are two Inventory Gardens and Designed Landscapes, two conservation areas, three scheduled monuments (a fort, a cairn, and Balloch Castle), and 91 listed buildings located between 2 km – 5 km from the site. In addition, there are five non-designated assets identified by WoSAS on their NSR as of potential national importance. Parts of the Antonine Wall World Heritage Site are located

between 5 km – 10 km from the site, along with two Inventory Gardens and Designed Landscapes, 44 scheduled monuments (including one Property in Care- Dumbarton Castle), and 16 Category A listed buildings. Beyond 10 km there are eight Inventory Gardens and Designed Landscapes and 654 Category A listed buildings. There are no Inventory battlefields within the OSA.

Potentially Significant Effects

4.2.69. The scope of the EIAR will consider:

- Direct physical effects;
- Indirect effects; and
- Effects on setting.

Desk-based Assessment

4.2.70. A baseline Desk-based Assessment will be conducted to establish the baseline condition of the site. The principal sources of information will be the Historic Environment Records (HERs), supplemented by relevant published documentary and cartographic material as appropriate, including sources of aerial photography as appropriate.

4.2.71. LIDAR digital terrain model (DTM) data is available from the Scottish Remote Sensing Portal for half of the site for the survey of potential hitherto unknown heritage assets within the site.

4.2.72. A site visit will be undertaken to ‘ground-truth’ the results of the LIDAR survey, as well as to record site characteristics, any visible archaeology and geographical/geological features which may have a bearing on previous land use and archaeological survival, as well as those which may constrain subsequent archaeological investigation.

Stage 1 Setting Assessment

4.2.73. Likely significant effects on the settings of heritage assets will be identified from an initial desk-based appraisal of data from HES, the HER and consideration of current maps and aerial images available via online sources. The methodology adopted for the identification and assessment of potential effects on setting follows the approach set out in Managing Change in the Historic Environment: Setting (Historic Environment Scotland, 2016, updated 2020) and the Environmental Impact Assessment Handbook (Ver 5, NatureScot & HES, 2018, Appendix 1). The guidance sets out three stages in assessing the impact of development on the setting of a heritage asset or place as follows:

- *“Stage 1: Identify the historic assets that might be affected by a development;*
- *Stage 2: define and analyse the setting by establishing how the surroundings contribute to the ways in which the historic asset or place is understood, appreciated, and experienced; and*
- *Stage 3: evaluate the likely significant effect of the proposed changes on the setting, and the extent to which any negative impacts can be mitigated.”*

4.2.74. The Stage 1 Setting Assessment methodology considers each heritage asset in the OSA in turn to identify heritage assets in the ZTV that have a wider landscape setting that contributes to their cultural significance and whether it is likely that cultural significance would be harmed by the Proposed Development. Where heritage assets are located out with the ZTV, third-party viewpoints within the ZTV which may provide a key view towards the heritage asset and the application site are considered.

- 4.2.75. Where this initial appraisal identifies the potential for a significant effect, the asset will be visited to define baseline conditions and identify key viewpoints. Visualisations will be prepared to illustrate changes to key views where potentially significant effects are identified.
- 4.2.76. Consultation with national and regional curators (HES and the Councils of West Dunbartonshire and Stirling) will be undertaken to agree the viewpoints for the EIAR setting assessment.

Proposed Assessment Methodology and Consultation

- 4.2.77. Effects on cultural heritage can arise through direct physical effects, indirect effects, or effects on setting.
- Direct physical effects describe those development activities that directly cause damage to the fabric of a heritage asset. Typically, these activities are related to construction works and will only occur within the application site.
 - Indirect effects describe secondary processes, triggered by the Proposed Development, which lead to the degradation or preservation of heritage assets. For example, changes to hydrology may affect archaeological preservation; or changes to the setting of a building may affect the viability of its current use and thus lead to dereliction.
 - An effect on the setting of a heritage asset occurs when the presence of a development changes the surroundings of a heritage asset in such a way that it affects (positively or negatively) the cultural significance of that asset. Visual effects are most commonly encountered but other environmental factors such as noise, light or air quality can be relevant in some cases. Impacts may be encountered at all stages in the life cycle of a development from construction to decommissioning, but they are only likely to lead to significant effects during the prolonged operational phase of the Proposed Development.
- 4.2.78. Cultural heritage constraint areas will, where necessary, be defined to include an appropriate buffer around known heritage assets. Constraint areas can be treated as a ‘trigger’ for the identification of potential direct effects: they represent areas within which works may lead to direct effects of more than negligible effect significance on known heritage assets.
- 4.2.79. Likely significant effects on unknown heritage assets will be discussed in terms of the risk that a significant effect could occur. The level of risk depends on the level of archaeological potential combined with the nature and scale of disturbance associated with construction activities and may vary between high and negligible for different elements or activities associated with a development, or for the Proposed Development as a whole.

Potential Impacts

Construction

- 4.2.80. Any infrastructure or access tracks associated with the Proposed Development will be designed to avoid the non-designated heritage assets within the site. Should any previously unknown heritage assets be noted during the desk-based assessment or LIDAR/walkover survey, any infrastructure associated with the Proposed Development such as access tracks will take into account the presence of these heritage assets and avoid them through design.

- 4.2.81. Precautionary mitigation to avoid accidental direct impacts on heritage assets within the site during construction may include demarcating their presence using physical barriers, if appropriate, with a suitable buffer off the asset established.
- 4.2.82. Where direct impacts are identified through EIA, evaluation methodologies may be employed (such as intrusive works) to better understand the extent and cultural significance of archaeological remains.
- 4.2.83. Where potentially significant impacts are identified, mitigation measures will be proposed. The preferred mitigation option is always to avoid or reduce impacts through design, or through precautionary measures such as fencing off heritage assets during construction works. Effects which cannot be eliminated in these ways will lead to residual effects.
- 4.2.84. Adverse effects may be mitigated by an appropriate level of survey, excavation, recording, analysis, and publication of the results, in accordance with a written scheme of investigation (SPP paragraph 150 and PAN2/2011, sections 25-27). Archaeological investigation can have a beneficial effect of increasing knowledge and understanding of an asset, thereby enhancing its archaeological and historical interest and offsetting adverse effects.

Operation

- 4.2.85. Design will take into account any identified likely significant effects of the Proposed Development on the settings and cultural significance of any additional heritage assets identified during Stage 1 Setting Assessment in the OSA.
- 4.2.86. For example, design will seek to ensure that the Proposed Development will not dominate heritage assets that were intentionally constructed historically to be prominent landscape features, and will seek to maintain key intentional sightlines between, to, from or across associated and contemporary monuments, or designed vistas. The Proposed Development layout will not impact upon any intact cultural landscapes. It is acknowledged that there are other factors which might form part of the setting of a heritage asset as outlined in Managing Change in the Historic Environment: Setting (Historic Environment Scotland, 2016, updated 2020) summarised in this Scoping Report above.
- 4.2.87. Cumulative effects will be considered in cases where an effect of more than negligible significance would occur upon a heritage asset, as identified through EIA, as a result of the Proposed Development. Wind energy developments (operational, under construction, consented or at application stage) are included in the cumulative assessment where they also feature prominently within views of or towards heritage assets identified as affected by the Proposed Development, thus also have a potential to impact upon cultural their significance.

Assessment Methodology

- 4.2.88. To assess the significance of the effect of the Proposed Development upon cultural heritage, the importance of each heritage asset is assessed against the potential magnitude of change upon it using a reasoned matrix-style approach.

Importance of Receptor

- 4.2.89. The importance of a heritage asset is the overall value assigned to it based on its cultural significance, reflecting its statutory designation or, in the case of non-designated assets, the professional judgement of the assessor.
- 4.2.90. Any feature which does not merit consideration in planning decisions due to its cultural significance may be said to have negligible heritage importance; in general, such features are not considered as heritage assets and are excluded from the EIAR.

Table 4.3: Importance of receptor criteria

Importance of Receptor	Criteria
High	World Heritage Sites, Inventory Gardens and Designed Landscapes, Scheduled Monuments, Protected Wreck Sites, Inventory Historic Battlefields, Category A and B Listed Buildings, Historic Marine Protected Areas, and non-designated heritage assets of equivalent importance that contribute to national research objectives
Medium	Conservation Areas, Category C Listed Buildings, undesignated assets of regional importance except where their particular characteristics merit a higher level of importance, heritage assets on local lists and non-designated assets that contribute to regional research objectives
Low	Locally listed heritage assets, except where their particular characteristics merit a higher level of importance, undesignated heritage assets of Local importance, including assets that may already be partially damaged
Negligible	Identified historic remains of no importance in planning considerations, or heritage assets and findspots that have already been removed or destroyed (i.e., 'site of')

Magnitude of Impact

- 4.2.91. The magnitude of an effect is a measure of the degree to which the cultural significance of a heritage asset will potentially change as a result of the Proposed Development (NatureScot & HES 2018, Environmental Impact Assessment Handbook, v5 Appendix 1, para 42). This definition of magnitude applies to likely effects on the setting as well as likely physical effects on the fabric of an asset.

Table 4.4: Magnitude of impact criteria

Sensitivity of Receptor	Criteria
High	Alterations to an asset and/or its setting resulting in a considerable enhancement or loss of cultural significance. / Preservation of an asset and/or its setting where it would otherwise suffer considerable loss of cultural significance in the do-nothing scenario.
Medium	Alterations to an asset and/or its setting resulting in moderate enhancement or loss of cultural significance. / Preservation of an asset and/or its setting where it would otherwise suffer moderate loss of cultural significance in the do-nothing scenario.
Low	Alterations to an asset and/or its setting resulting in a slight enhancement or loss of cultural significance. / Preservation of an asset and/or its setting where it would otherwise suffer slight loss of cultural significance in the do-nothing scenario.
Negligible	Alterations to an asset and/or its setting resulting in a barely perceptible enhancement or loss of cultural significance. / Preservation of an asset and/or its setting where it would otherwise suffer barely perceptible loss of cultural significance in the do-nothing scenario.

Significance of Effect

- 4.2.92. The significance of an effect ('EIA significance') on the cultural significance of a heritage asset, resulting from a direct or indirect physical effect or an effect on its setting is assessed by combining the magnitude of the impact and the importance of the heritage asset.

Table 4.5: Significance of effect matrix

Importance of Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major/Moderate	Moderate/Minor	Minor
Medium	Major/Moderate	Moderate	Minor	Minor/Negligible
Low	Moderate/Minor	Minor	Minor/Negligible	Minor/Negligible
Negligible	Minor	Minor/Negligible	Minor/Negligible	Negligible

- 4.2.93. It is common practice to identify EIA effects as significant or not significant, and in this proposed EIAR, Major and Moderate effects will be regarded as 'significant' in EIA terms, while Minor and Negligible effects are 'not significant'.
- 4.2.94. Impact assessment conclusions upon scheduled monuments will also be presented in the terms of SPP paragraph 145 i.e. "*Where there is potential for a proposed development to have an adverse effect on a scheduled monument or on the integrity of its setting.*"

SPP does not define 'integrity' in the context of paragraph 145, therefore for the purposes of the assessment, the integrity of a setting is considered to be maintained if the principal characteristics of the setting that contribute to the cultural significance of the asset are retained, and it would continue to be possible to appreciate and understand the scheduled monument in its setting.

Effects Scoped Out of the Assessment

- 4.2.95. The extent of ground disturbance associated with decommissioning will not extend beyond the construction footprint and so decommissioning effects on heritage assets within the site will not occur. Any residual operational phase setting effects will be reversed. Decommissioning effects are therefore proposed to be scoped out of the assessment.
- 4.2.96. Construction phase setting effects will be temporary and are not considered to be significant in EIA due to their very short duration. Construction phase setting effects are therefore proposed to be scoped out of the assessment.
- 4.2.97. *Questions for Consultees*
- Do consultees agree with the proposals for 'Scoped out Effects' in this Scoping Report?
 - Are consultees content with the proposed Outer Study Area buffers presented in this Scoping Report?
 - Are there any other relevant consultees other than HES and the Councils who should be contacted with respect to the Cultural Heritage and Archaeology assessment?
 - Do consultees wish to request any specific heritage assets to be assessed in the EIAR?

Ecology

Introduction

- 4.2.98. This section of the Scoping Report describes the baseline conditions, relevant guidance and legislation, proposed scope of assessment and methodology, mitigation and identified potential impacts of the Proposed Development in relation to ecological features. Potential effects on birds are considered separately in Section 4.2.5: Ornithology.

Guidance

- 4.2.99. The following legislation, policy and guidance relating to ecology will be considered as part of the assessment.

Legislation and Policy:

- Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (the Habitats Directive);
- Environmental Impact Assessment Directive 2014/52/EU (the EIA Directive); and
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive).

- The Wildlife and Countryside Act 1981 (as amended);
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (The Habitats Regulations);
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations);
- Circular 1/2017; The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Planning Advice Note (PAN) 1/2013 – Environmental Impact Assessment, Revision 1.0 (Scottish Government 2017);
- The Protection of Badgers Act 1992;
- The Water Environment and Water Services (Scotland) Act 2003; and
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011.

Guidance:

- CIEEM (2018) Guidelines for Ecological Impact Assessment;
- Dunbartonshire Local Biodiversity Action Plan (2010-2013);
- The Scottish Biodiversity List;
- SERAD (2001) European Protected Species, Development Sites, and the Planning Systems: Interim guidance for local authorities on licensing arrangements;
- Wind Energy Developments and Natura 2000;
- JNCC (2010) Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);
- NatureScot Guidance (SNH 2015, 2016a, 2016b, 2018a, 2018b; NatureScot 2021)
- Collins (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition);
- SEPA (2017) Land Use Planning System Guidance Note 31;
- Scottish Badgers (2018) Surveying for Badgers: Good Practice Guidelines; and
- NatureScot et al. (2019) Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation.

Baseline Survey Methodology

Study Areas

4.2.100. The ecology assessment will consider the following study areas (Figure 4.2.4a and b):

- Desk study area (Designated sites, ancient woodland, protected species records): 5 km buffer on the site boundary (Figure 4.2.4a);
- Habitats study area (Figure 4.2.4b): Site boundary and buffer up to 300m if necessary; and
- Protected Species study area (Figure 4.2.4b): Site boundary and buffer up to 200m if necessary.

Desk Study and consultation

4.2.101. A desk-study will be undertaken to gather information from a variety of sources and from consultation with several key stakeholders and conservation organisations, such as those outlined below:

- National Biodiversity Network (NBN) Atlas Scotland for historical species records;
- NatureScot Sitelink for designated sites information;
- Scotland’s Soils Carbon and Peatland Map;
- Ancient Woodland Inventory sites within 5 km of the site boundary;
- Scottish Badgers; and
- Deer Distribution Survey results by the British Deer Society.

4.2.102. In addition to this, ecological information available in the public domain relating to applications for local renewables or other projects will be reviewed and referred to, in order to gather additional baseline information and further local/regional context.

4.2.103. The assessment would in particular take into consideration the historic ecological data, assessment and consultation associated with a previous planning application (Merkins Wind Farm) covering a similar area to the Proposed Development.

Field Study

4.2.104. Ecology baseline surveys were initiated in 2020 and are scheduled to continue in 2022 within the study areas, as required. Surveys follow standard methodologies and guidance, as listed below. The following surveys have been undertaken to date:

- National Vegetation Classification (NVC) habitat surveys following the NVC scheme² and methods³ and incorporating Phase 1 Habitat Survey characterisation⁴. Surveys were undertaken within the study area, excluding an updated access track arrangement, during July 2020;
- Based on information gathered from a desk study (see section protected species surveys within the study area (excluding the updated access track arrangement) were undertaken in July 2020 and January 2021 following standard methodologies for the following species: otter (*Lutra lutra*)^{5,6,7}, badger (*Meles meles*)^{8,9}, water vole (*Arvicola amphibius*)¹⁰, pine marten (*Martes martes*)¹¹ and red squirrel (*Sciurus vulgaris*)¹². Incidental records of reptile sightings, or signs such as shed skins, and features of particular importance (i.e., potential hibernacula) were also recorded;

2 Rodwell, J.S. (Ed) et al. (1991 – 2000). British Plant Communities (5 volumes). Cambridge University Press, Cambridge.

3 Rodwell, J.S. (2006). NVC Users' Handbook. ISBN 978 1 86107 574 1.

4 Joint Nature Conservancy Council. (2010). Handbook for phase 1 habitat survey – a technique for environmental audit. JNCC, Peterborough.

5 Bang, P., and Dahlström, P. (2001). Animal Tracks and Signs. Oxford University Press, Oxford.

6 Sargent, G., and Morris, P. (2003). How to Find and Identify Mammals. The Mammal Society, London.

7 Chanin, P. (2003). Monitoring the Otter (*Lutra lutra*). Conserving Natura 2000 Rivers Monitoring Series No.10 English Nature, Peterborough.

8 Neal, E., and Cheeseman, C.L. (1996). Badgers. Poyser Natural History, London.

9 Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines. Version 1.

10 Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.

11 O' Mahony D., O' Reilly, C. & Turner, P. (2006). National Pine Marten Survey of Ireland 2005. Council for Forest Research and Development, Ireland.

12 Gurnell, J., Lurz, P. McDonald, R. & Pepper, H. (2009). Practical Techniques for Surveying and Monitoring Squirrels. Forestry Commission Practice Note.

- A Preliminary Roost Assessment (PRA) for bats within the study area in line with guidance¹³; and
- Seasonal static bat detector (anabat) surveys following recommended guidelines¹⁴ with 13 anabats deployed around the site seasonally between May and October 2020 inclusive.

4.2.105. The following surveys will be undertaken in 2022:

- Further NVC surveys as required to cover finalised access track arrangements and if the iterative design process triggers the need for further habitat data or survey coverage e.g., to ensure appropriate buffers are surveyed for potential Groundwater Dependent Terrestrial Ecosystems (GWDTE) as per SEPA guidance¹⁵;
- PRA for bats within any unsurveyed access track locations in line with guidance¹³;
- Additional protected species surveys, using the same methodologies as the surveys undertaken in 2020 and 2021, will be carried out within the updated access track portion of the survey area, and as required as part of the iterative design process.

Existing Baseline Conditions

Desk Study

4.2.106. Baseline conditions established through desk study conducted so far are summarised below:

- Numerous areas of Ancient Woodland are listed within the 5 km study area. Some of these overlap with the site boundary of the Proposed Development, including Murroch Glen in the south-east of the site, and narrow strips of unnamed patches at the east and north of the site (Figure 4.2.4a).
- Dumbarton Muir SSSI, designated for blanket bog and raised bog habitats, and Auchencroch Glen SSSI, designated for lowland calcareous grassland and spring habitats, both lie within the site boundary (Figure 4.2.4a). Other sites designated for ecological features lie within the 5 km study area, including the Endrick Water Special Area of Conservation (SAC) and SSSI, designated for Atlantic salmon (*Salmo salar*), river lamprey (*Lampetra fluviatilis*) and brook lamprey (*Lampetra planeri*) (Figure 4.2.4b).
- The NBN Atlas returned records of the following species within 5 km of the study area in the last 15 years:
 - Adder (*Vipera berus*);
 - Brown hare (*Lepus europaeus*);
 - Common lizard (*Zootoca vivipara*);
 - Daubenton's bat (*Myotis daubentonii*);
 - Badger;
 - Otter;
 - Water vole;
 - Palmate newt (*Lissotriton helveticus*);
 - Pine marten;

13 Collins, J. (ed) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

14 Scottish Natural Heritage, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019). Bats and Onshore Wind Turbines: Survey Assessment and Mitigation.

15 SEPA (2017). Land Use Planning System SEPA Guidance Note 4: Planning guidance on on-shore windfarm developments. Version 3. Issue date: 11/09/2017 and SEPA (2017). Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Version 3. Issue date: 11/09/2017.

- Pipistrelle bat species (*Pipistrellus* spp.);
 - Red deer (*Cervus elaphus*);
 - Roe deer (*Capreolus capreolus*);
 - Smooth newt (*Lissotriton vulgaris*); and
 - Soprano pipistrelle (*Pipistrellus pygmaeus*).
- The NBN Atlas also returned records of the following invasive non-native species within 5 km of the site in the last 15 years:
 - Himalayan balsam (*Impatiens glandulifera*);
 - Japanese knotweed (*Fallopia japonica*); and
 - Rhododendron (*Rhododendron ponticum*).
 - The Carbon and Peatland Map indicates that the northern part of the site is made up of areas of Class 1¹⁶ and Class 2¹⁷ peatland (Figure 4.2.4a), with the remainder of the site comprising mineral soils, Class 3¹⁸ and Class 5¹⁹ soils.
 - Consultation with the Loch Lomond Fisheries Trust (LLFT) undertaken as part of the 2011 Merkins Wind Farm Environmental Statement (ES) suggested that although the watercourses on site have connectivity to the River Endrick, waterfalls in the Finland Burn and the upper reaches of the Catter Burn are likely to act as a barrier to Atlantic salmon and lamprey. LLFT suggested that only resident brown trout populations are likely to be present.
 - Surveys carried out to inform the Merkins Wind Farm ES found signs of otter including spraints and feeding remains in addition to potential couches were identified in the course of the surveys.
 - No evidence of great crested newt was recorded during surveys for Merkins Wind Farm, and it was noted that the surveyed ponds had limited suitability for the species due to their size, ephemeral nature and the disturbance of terrestrial habitat surrounding the ponds. Palmate newts and common frog (*Rana temporaria*) were identified during these surveys.
 - The Merkins Wind Farm ES states that five species of bat were recorded on site, including common and soprano pipistrelles which are classified as having a high collision risk.
 - Surveys carried out to inform the Merkins Wind Farm ES recorded sightings of adder and common lizard.
 - Fallow deer (*Dama dama*), roe deer and red deer were recorded in the wider area by the 2016 Deer Distribution Survey. All three species were reconfirmed in 2016 in addition to being recorded in 2007 and/or 2011 surveys.

¹⁶ Nationally important carbon-rich soils, deep peat, and priority peatland habitat. Areas likely to be of high conservation value (Carbon and peatland 2016 map | Scotland's soils (environment.gov.scot) (Accessed 10/03/2022)

¹⁷ Nationally important carbon-rich soils, deep peat, and priority peatland habitat. Areas of potentially high conservation value and restoration potential (Carbon and peatland 2016 map | Scotland's soils (environment.gov.scot) (Accessed 10/03/2022)

¹⁸ Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat (Carbon and peatland 2016 map | Scotland's soils (environment.gov.scot) (Accessed 10/03/2022)

¹⁹ Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat (Carbon and peatland 2016 map | Scotland's soils (environment.gov.scot) (Accessed 10/03/2022)

Field Surveys

- NVC habitat surveys identified habitat communities including blanket bog (mainly M17 *Scirpus cespitosus-Eriophorum vaginatum* blanket mire or M19 *Calluna vulgaris-Eriophorum vaginatum* blanket mire), wet modified bog (M25 *Molinia caerulea-Potentilla erecta* mire) wet heath (M15 *Scirpus cespitosus-Erica tetralix* wet heath), dry heath (H12 *Calluna vulgaris-Vaccinium myrtillus* heath) as well as marshy grassland, acid grassland, flushes, and broadleaved semi-natural woodland.
- Some of the communities may be classified, depending on the hydrological setting, as GWDTEs, including M6 (*Carex echinate-Sphagnum fallax/denticulatum* mire), M23 (*Juncus effusus/acutiflorus – Galium palustre* rush-pasture), CG10 (*Festuca ovina – Agrostis capillaris – Thymus praecox*), W7 (Alder-Ash-Yellow Pimpernell woodland) and (MG10 (*Holcus lanatus – Juncus effusus* rush pasture).
- No evidence of water vole, pine marten or red squirrel was recorded during the 2020-2021 surveys.
- Suitable habitat for otter was recorded in Finland Burn, Gallangad Burn and Murroch Burn in the 2020-2021 surveys, although there were no field signs confirming presence of otter. Catter Burn was identified as having a high degree of suitability for otter due to foraging resource and shelter opportunities.
- Common lizard (*Zootoca Vivipara*) sightings were recorded during surveys in 2020, with several features suitable for use as hibernacula also identified.
- Several badger setts were identified within the study area, with some entrances appearing to be well used.
- 18 tree groups and 11 individual trees, were identified during surveys in 2020 as having potential roost features for bats. Of these, eight were classified as having high potential for roost features, and the rest were classified as having moderate potential.
- Static bat detectors recorded four species and two species groups of bats during their deployment over three seasons in 2020: Daubenton's bat, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle, brown long-eared bat *Plecotus auratus*, *Myotis* spp. and *Nyctalus* spp. Analysis of the data suggested nearby roosts for common and soprano pipistrelle, Daubenton's and brown long-eared bats may be present. Common and soprano pipistrelle passes accounted for 99.2% of the recorded bat passes.

Potentially Significant Effects

Construction/Decommissioning Effects

4.2.107. Based on the available information to date from baseline surveys and the preliminary results from the desk-based study, the following construction/decommissioning effects will be assessed:

- Temporary and permanent loss/alteration/fragmentation of habitats within the site, including loss of shelter, breeding, and foraging habitat for protected species;
- Water and dust pollution; and
- Disturbance, injury, or death to protected species associated with construction activities.

Operational Effects

4.2.108. Based on the available information to date from baseline surveys and the preliminary results from the desk-based study, the following operational effects are likely to be assessed:

- Direct or indirect habitat loss from spatial impacts of permanent infrastructure;
- Displacement from shelter, breeding, or foraging habitats of protected species, including barrier effects; and
- Risk of bats colliding with or suffering barotrauma from proximity to moving turbine blades, including attraction to lighting associated with turbines.

Proposed Assessment Methodology and Consultation

4.2.109. The EIAR will include an Ecological Impact Assessment (EclA). This will consider the potential direct, indirect, and cumulative effects that the construction, operation, and decommissioning of the Proposed Development could have on any identified Important Ecological Features (IEFs) scoped into the assessment. The EclA will be supported by technical appendices that will include details of survey methodologies and all survey data.

4.2.110. The assessment involves the following processes:

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

4.2.111. NCV is defined on the basis of the geographic scale, and it is also necessary to consider each feature's conservation status, its distribution and its population trend based on available historic records, to give an overall level of sensitivity.

4.2.112. The significance of potential effects is determined by integrating the sensitivity and magnitude in a reasoned way.

4.2.113. A set of pre-defined significance criteria will be used in assessing the potential effects of the Development. It is necessary to establish whether there will be any effects which will be sufficient to adversely affect the feature to the extent that its conservation status deteriorates above and beyond that which would be expected should baseline conditions remain (i.e., the 'do nothing' scenario). Furthermore, these predictions will be given with a level of confidence relative to the effect being assessed where required (in line with CIEEM 2018).

Cumulative Effects

4.2.114. An assessment of cumulative effects will be undertaken following published guidance (SNH 2012²⁰). Cumulative effects on each IEF will be assessed in relation to other projects and activities subject to the EIA process within a relevant search area, and their effects on a relevant reference population; for example, at a watercourse, watershed, or Natural Heritage Zone (NHZ) level.

Approach to Mitigation and Enhancement

4.2.115. Potentially significant effects on habitats and protected species will be avoided/minimised where possible within the design layout process.

4.2.116. Good practice during construction and operation of the Proposed Development will include the following measures, regardless of the conclusions of the assessment:

- A Species Protection Plan (SPP) would be implemented as part of a Construction Environmental Management Plan (CEMP) or similar during the construction phase, to ensure that all reasonable precautions are taken to adhere to the relevant wildlife legislation;
- Pre- and during- construction surveys carried out by an Ecological Clerk of Works or suitably qualified ecologist would take places as part of the SPP; and
- A Habitat Management Plan (HMP) would be developed and agreed with consultees to mitigate or enhance habitat for IEFs and to provide wider biodiversity improvements.

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

Effects Scoped Out of the Assessment

4.2.118. On the basis of baseline data available to date, experience from other relevant projects, policy guidance or standards, and the embedded mitigation proposed (SPP, CEMP, ECoW presence, HMP) all ecological features will be scoped out of the EclA since significant effects are unlikely, except for the following:

- Annex I habitats, for example blanket bog, wet heath, dry heath and semi-natural native/ancient woodland, or other habitats considered to be of higher conservation value, e.g., within the context of the Local Biodiversity Action Plan (LBAP). Inclusion in the EclA would also be based on whether a non-trivial amount of habitat may be affected;
- Dumbarton Muir SSSI and Auchenreoch Glen SSSI within the site; and
- Bats – particularly in relation to potential collision effects.

4.2.119. The list of ecological features to be taken forward to assessment will be subject to the outcomes of ongoing surveys in 2022.

4.2.120. Evidence presented in the Merkins Wind Farm application suggests that barriers to fish migration exist between the watercourses within the site and Endrick Water SAC, and with the SPP and CEMP in place to protect watercourses during construction, it is proposed that no Appropriate Assessment is required for the Endrick Water SAC under the Habitats Regulations Appraisal process.

²⁰ SNH (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments.

Questions for Consultees

- Do consultees agree that, subject to further information coming to light from the field surveys and desk study, the scope of IEFs, including designated sites, to be included in the assessment is appropriate?
- Do consultees agree that the data obtained in 2019 and the suite of field surveys planned for 2022 as well as a desk study is sufficient to inform a robust impact assessment?
- Are there any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the ecology assessment?
- Do consultees agree that the methodology and scope of assessment is appropriate?

Ornithology

Introduction

- 4.2.121. This section of the Scoping Report defines the proposed methodology and approach to be undertaken for the ornithological assessment that will be included within the EIAR. Potential effects on habitats and protected species are considered separately in the Ecology Section of this report.
- 4.2.122. This section will summarise the methods used to establish the baseline conditions within the site and its surroundings, the results of the baseline surveys, and the process used to determine the sensitivity of species' populations present, magnitude of impacts and significance of effects.
- 4.2.123. The ways in which species might be affected (directly or indirectly) by the construction, operation and decommissioning of the Proposed Development are proposed to be assessed prior to and after any mitigation measures are considered. In addition, any cumulative effects will be considered, taking together effects of other wind farm projects in the area, whether operational, consented or at application stage, along with the significance of any predicted effects associated with the Proposed Development.

Guidance

Legislation

- 4.2.124. Relevant European legislation will be reviewed and taken into account as part of the ornithological assessment. Of particular relevance is the following European legislation:
- Directive 2009/147/EC on the Conservation of Wild Birds ('Birds Directive');
 - Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) ('Habitats Directive'); and
 - Environmental Impact Assessment Directive 2014/52/EU (the EIA Directive).
- 4.2.125. The following national legislation, which has recently been amended because of the EU exit (Scottish Government, 2019²¹; 2020²²), will also be considered as part of the ornithology assessment:

21 Scottish Government (2019). The Town and Country Planning and Electricity Works (EU Exit) (Scotland) (Miscellaneous Amendments) Regulations 2019. Available at: <https://www.legislation.gov.uk/ssi/2019/80/introduction/made>

22 Scottish Government (2020). EU Exit: The Habitats Regulations in Scotland. Available at: <https://www.gov.scot/publications/eu-exit-habitats-regulations-scotland-2/>

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (The Habitats Regulations);
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011; and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations).

Policy

- Scottish Government (2000). Planning Advice Note 60: Planning for Natural Heritage;
- Scottish Government (2017). Planning Advice Note (PAN) 1/2013 – Environmental Impact Assessment, Revision 1.0;
- UK Post-2010 Biodiversity Framework (2012);
- Scottish Biodiversity Strategy: It's in Your Hands (2004) /2020 Challenge for Scotland's Biodiversity (2013);
- Scotland 2045 – fourth National Planning Framework – draft consultation (November 2021);
- The Scottish Biodiversity List; and
- West Dunbartonshire Local Biodiversity Action Plan (2017-2020).

Guidance

- CIEEM (2018). Guidelines for Ecological Impact Assessment;
- European Commission (2010) Natura 2000 Guidance Document 'Wind Energy Developments and Natura 2000'. European Commission, Brussels;
- NatureScot (2020a). General pre-application and scoping advice for onshore wind farms. Guidance;
- NatureScot (2020b). The Effect of Aviation Obstruction Lighting on Birds at Wind Turbines, Communication Towers and Other Structures. NatureScot Information Note;
- Pearce-Higgins, J.W. (2021). Climate Change and the UK's Birds. British Trust for Ornithology Report, Thetford, Norfolk;
- Scottish Natural Heritage (2000). Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action. SNH Guidance Note. SNH;
- Scottish Natural Heritage (2019). Good Practice during Wind Farm Construction. 4th Edition;
- Scottish Natural Heritage (2018a). Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas;
- Scottish Natural Heritage (2018b). Assessing the cumulative impacts of onshore wind farms on birds. SNH Guidance Note;
- Scottish Natural Heritage (2018c). Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland;
- Scottish Natural Heritage (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms;
- Scottish Natural Heritage (2016a). Assessing connectivity with Special Protection Areas (SPAs);

- Scottish Natural Heritage (2016b). Environmental Statements and Annexes of Environmentally Sensitive Bird Information; Guidance for Developers, Consultants and Consultees Version 2;
- Scottish Executive Rural Affairs Department (SERAD) (2000). Habitats and Birds Directives, Nature Conservation; Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna; and
- Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. and Win, I. (2021). Birds of Conservation Concern 5: the status of all regularly occurring birds in the UK, Channel Islands, and the Isle of Man. *British Birds* 114: 723-747.

Baseline Study Methodology

Study Areas

4.2.126. The EIAR will consider the following study areas which will all be buffered from the finalised turbine layout and access track (with the exception of the Natural Heritage Zone (NHZ) scale as these are pre-defined by NatureScot):

- Designated sites: a 20 km buffer around the finalised turbine layout and access track (SNH 2016a Figure 4.2.5a);
- Collision risk modelling: the results of the flight activity surveys will be used to inform collision modelling. A Collision Risk Analysis Area (CRAA) will be created using GIS Delaunay triangulation from the outermost proposed turbine locations to create a wind farm area which will then be buffered by 500 m (as per SNH 2017);
- Scarce breeding birds²³: a 2 km buffer around the finalised turbine layout and access track (SNH 2017);
- Black grouse: a 1.5 km buffer around the finalised turbine layout and access track (SNH 2017);
- Breeding upland waders and wintering waders, raptors, owls, and wildfowl: a 500 m buffer around the finalised turbine layout and access track (SNH 2017);
- Cumulative assessment – as per NatureScot guidance (SNH 2018b), the NHZ level is considered practical and appropriate for breeding species of wider countryside interest; and
- In-combination assessment – required as part of the Habitats Regulations Appraisal (HRA) process, SNH (2016a) guidance will be consulted to identify an appropriate study area per species scoped into the assessment.

Desk Study and Consultation

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

- Pre-application consultation for the Proposed Development with NatureScot (including MacArthur Green Vale of Leven Wind Farm Ornithology Technical Report 2019²⁴);
- Merkins Wind Farm Environmental Statement and accompanying Ornithology Technical Appendix (Arcus Renewable Energy Consulting, 2011²⁵);
- Scottish Raptor Study Group (SRS): provision of historic raptor nest locations;

²³ Scarce breeding birds are those listed on Annex 1 of the EU Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and in the case of the Proposed Development consists of any raptor and owl species listed on either Annex 1 or Schedule 1.

²⁴ MacArthur Green (2019). Vale of Leven Wind Farm: Ornithology Technical Report 2019

²⁵ Arcus Renewable Energy Consulting Ltd, 2011. Merkins windfarm ornithology technical report.

- NatureScot SiteLink²⁶: information on Special Protection Areas (SPAs), Sites of Special Scientific Interest (SSSIs) and Ramsar sites; and
- RSPB Scotland: provision of species presence at RSPB Loch Lomond Nature Reserve.

Field surveys

Merkins Wind Farm Surveys 2008 to 2009

- 4.2.128. The Proposed Development overlaps with the application site boundary of the previously proposed Merkins Wind Farm (hereafter referred to as the 'Merkins Windfarm Site'). Baseline bird surveys were carried out in 2008 and 2009 and details are set out in the Merkins Windfarm 2011 ES and accompanying Ornithology Technical Appendix (Arcus Renewable Energy Consulting, 2011²⁵)
- 4.2.129. Pre-application consultation with NatureScot (email dated 14th January 2020) confirmed that one year of baseline ornithology data collected for the Proposed Development in 2019 and 2020 together with ornithology data collected in 2008 and 2009 for the Merkins Wind Farm Site is sufficient to inform the EIA.
- 4.2.130. The following surveys were undertaken for the Merkins Windfarm Site in line with contemporary SNH (2005²⁷) guidance with additional guidance from Gilbert et al. (1998²⁸) and Hardey et al. (2009²⁹). All areas surveyed for the Merkins Windfarm Site are illustrated on Figures 10.2 and 10.3 of the Merkins Windfarm Ornithology Technical Appendix (Arcus Renewable Energy Consulting, 2011²⁵).
- Flight activity (Vantage Point, VP) surveys, three VP locations: September 2008 to August 2009;
 - Breeding raptor surveys, 2 km survey area around site boundary: March to July 2009;
 - Barn owl survey, 1 km survey area around site boundary: January 2009;
 - Long-eared owl survey, 500 m survey area around site boundary: March 2009;
 - Breeding diver surveys, specific breeding location around site boundary: June and July 2009;
 - Black grouse surveys, 1.5 km survey area around site boundary: March to April 2009;
 - Breeding bird surveys, 500 m survey area around site boundary: April to June 2009; and
 - Winter Walkover Survey, 500 m survey area around site boundary: November 2008 to February 2009.

Baseline Surveys 2019 to 2020

- 4.2.131. The following surveys were undertaken for the Proposed Development in 2019 and 2020. The surveys have been undertaken in line with the appropriate guidance (SNH 2017,

²⁶ NatureScot SiteLink is available at: <https://sitelink.nature.scot/home>

²⁷ SNH (2005). Survey methods for use in assessing the impacts of onshore windfarms on bird communities.

²⁸ Gilbert, G., Gibbons, D. W. and Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy.

²⁹ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013) Raptors: a field guide for surveys and monitoring (3rd edition). The Stationery Office, Edinburgh.

Brown and Shepherd 1993³⁰, Hardey *et al.* 2013²⁹ and Gilbert *et al.* 1998²⁸) and within appropriate study areas (Figure 4.2.5b).

- Flight activity (VP) surveys, three VP locations: March 2019 to March 2020;
- Scarce breeding bird surveys, 2 km survey area around site boundary: March to August 2019;
- Black grouse surveys, 1.5 km survey area around site boundary: April to May 2019;
- Upland breeding bird surveys, 500 m survey area around site boundary: April to May 2019; and
- Winter walkover surveys, 500 m survey area around site boundary: November 2019 to February 2020.

Baseline Surveys 2022

4.2.132. The following surveys will be undertaken for the Proposed Development in 2022:

- Scarce breeding bird surveys, 2 km survey area around site boundary: March to August 2022; and
- Upland breeding bird surveys, access track route plus 500 m buffer: April to July 2022.

The surveys undertaken in 2022 will also cover any data gaps identified.

Existing Baseline Conditions

Designated Sites

4.2.133. There are no statutory designations with ornithological features within the site. There are four SPAs (underpinned by SSSIs and Ramsar sites) within 20 km of the Proposed Development that include ornithological features (Table 4.6, Figure 4.2.5a) as follows:

- Inner Clyde SPA (underpinned by Inner Clyde SSSI and Ramsar) is 4.2 km to the south of the site;
- Loch Lomond SPA (underpinned by Endrick Mouth and Islands SSSI, Inchcruin SSSI, Inchtavannach and Inchconnachan SSSI and Loch Lomond Ramsar) is 5.7 km to the north of the site;
- Black Cart SPA (underpinned by Black Cart SSSI) is 10.8 km to the south of the site;
- Renfrewshire Heights SPA (underpinned by Renfrewshire Heights SSSI) is 14.8 km to the southwest of the site; and
- Castle Semple and Barr Lochs SSSI is 18.9 km to the southwest of site.

4.2.134. Ornithological qualifying features (not including capercaillie) designated under the Loch Lomond SPA (**Table 4.6**) will be assessed under the terms of the HRA process due to potential connectivity between the Proposed Development and these protected sites, as agreed during pre-application consultation with NatureScot (email dated 14th January 2020). The associated SSSIs and Ramsar site will be considered as part of the EIA process.

4.2.135. The Inner Clyde SPA, Black Cart SPA and Renfrewshire Heights SPA (plus associated SSSIs and Ramsar site), and Castle Semple and Barr Lochs SSSI will be scoped out of the assessment due to lack of connectivity between the Proposed Development and

³⁰ Brown, A. F. and Shepherd, K. B. (1993) A method for censusing upland breeding waders. *Bird Study*, 40: 189-195.

these protected sites, as agreed during pre-application consultation with NatureScot (email dated 14th January 2020).

Table 4.6: Qualifying features of Loch Lomond SPA (underpinned by Endrick Mouth and Islands SSSI, Inchcruin SSSI, Inchtavannach and Inchconnachan SSSI and associated Loch Lomond Ramsar).

Feature	Qualifying Feature Category	Condition	Description	Connectivity Distance (SNH 2016)
Greenland white-fronted goose (<i>Anser albifrons flavirostris</i>), non-breeding	Ramsar, SPA and SSSI (Endrick Mouth and Islands)	January 2017: Favourable maintained	Wintering population of European importance: winter peak mean of 221 individuals between 1993/94 and 1997/98, representing 2% of GB.	5 – 8 km
Capercaillie (<i>Tetrao urogallus</i>), breeding	SPA, SSSI (Inchcruin; Inchtavannach and Inchconnachan)	March 2013: Unfavourable declining	Breeding population of European importance on the wooded islands of the SPA: mean March count of 32 individuals between 1995 and 1999, representing 1% of GB.	N/A
Breeding bird assemblage	SSSI (Endrick Mouth and Islands)	June 2002: Favourable maintained	Breeding population of national importance. Breeding bird assemblage includes: <ul style="list-style-type: none"> • shelduck (<i>Tadorna tadorna</i>); • redshank (<i>Tringa tetanus</i>); • snipe (<i>Gallinago gallinago</i>); • shoveler (<i>Anas crecca</i>); • grasshopper warbler (<i>Locustella naevia</i>); • reed bunting (<i>Emberiza schoeniclus</i>); • tree pipit (<i>Anthus trivialis</i>); • redstart (<i>Phoenicurus phoenicurus</i>); • pied flycatcher (<i>Ficedula hypoleuca</i>). There is also a heronry at Gartfairn Wood.	N/A
Greylag goose (<i>Anser anser</i>), non-breeding	SSSI (Endrick Mouth and Islands)	March 2014: Favourable maintained	Wintering population of national importance. GB % is unavailable. This species usually roosts in the vicinity of Crom Mhin, Ring Point and on Wards Pond. The Woodend fields, areas around Wards Pond and Limehill Field are important grazing areas for geese	15 – 20 km

Ornithological Activity

4.2.136. A summary of the March 2019 to March 2020 surveys is provided below with surveys for the 2022 breeding season currently ongoing (scheduled to finish in August 2022). NatureScot agreed during pre-application consultation (email dated 14th January 2020)

that ornithological survey results for the Proposed Development were largely consistent with those recorded at the Merkins Windfarm Site in 2008 and 2009.

Flight Activity Surveys

4.2.137. Flight activity surveys have recorded nine target³¹ species, collectively accounting for 38 flightlines (**Table 4.7**), of which 31 flightlines were recorded at Potential Collision Height (PCH) and may therefore be included in any collision risk modelling, depending on their location in relation to the final turbine layout and the turbine dimensions selected. The bird seconds are calculated for each observation as the product of flight duration and number of individuals. This is then summed per species to give the total bird seconds recorded across the entire surveyed period.

Table 4.7: Summary of Target Species Recorded During Flight Activity Surveys, March 2019 to March 2020

Species	Total Number of Recorded Flights	Total Number of Birds Recorded	Total Bird Seconds	Number of Flights Recorded at PCH	Total Bird Seconds at PCH
Black grouse	1	1	11	None	None
Golden plover	1	12	768	1	768
Goshawk	6	6	576	6	576
Greylag goose	1	4	560	None	None
Hen harrier	7	7	617	2	135
Herring gull	12	67	9,968	12	9,968
Osprey	7	7	990	7	990
Pink-footed goose	6	75	57,813	2	3,933
Whooper swan	1	21	1,785	1	1,785

Raptors and divers

4.2.138. Scarce breeding bird surveys during the 2019 breeding season recorded two target raptor species: osprey and peregrine falcon, but no breeding activity was recorded.

4.2.139. Ospreys were recorded on ten separate occasions in 2019 either foraging on Loch Humphrey within 500 m south of the proposed Development, or carrying food, potentially to a nest in the east outside of the 2 km survey area.

4.2.140. One immature female peregrine falcon was recorded flying along the northern boundary of the proposed Development in May 2019.

4.2.141. One goshawk and one hen harrier were recorded once in February 2020, and one merlin was recorded once in December 2019 during winter walk over surveys.

4.2.142. Divers were not recorded within the 2 km survey area in 2019.

³¹ Target species are those species listed as Annex 1 (EU Birds Directive) and/or Schedule 1 (Wildlife and Countryside Act) and/or are Red Listed (BOCC, Stanbury et al. 2021).

4.2.143. Ornithological surveys for the Merkins Windfarm Site recorded a total of three target raptor species including: hen harrier, merlin, and peregrine falcon; breeding activity was not recorded for any of these species in 2008 or 2009.

Black grouse

4.2.144. Black grouse were not recorded lekking anywhere within the 1.5 km survey area in 2019, including the area around the ruins at Auchenreoch where a black grouse lek was recorded in 2009. Only one individual black grouse was recorded in 2019, during the flight activity surveys.

Waders

4.2.145. Limited breeding activity was recorded for target wader species within the 500 m survey area. A maximum of two curlew territories were recorded within the Proposed Development and two lapwing territories were recorded within the 500 m buffer. A total of five golden plovers were recorded at the Proposed Development between late March and early April 2019, but these birds are considered likely to have been passing through the area on migration.

4.2.146. Ornithological surveys for the Merkins Windfarm Site recorded curlew within the 500 m survey area, it is likely that there were up to two or three curlew territories held within 500 m of the final layout of the Merkins Windfarm Site.

Potentially Significant Effects

Construction/Decommissioning Effects

4.2.147. Based on the available information to date from baseline surveys and the preliminary results from the desk-based study, the following construction/decommissioning effects will be assessed:

- Habitat loss/alteration/fragmentation associated with the site, including loss of nesting or foraging habitat for target species (e.g., for raptors, waders, or black grouse); and
- Disturbance to target species (breeding raptors, black grouse, waders) associated with construction activities.

Operational Effects

4.2.148. Based on the available information to date from baseline surveys and the preliminary results from the desk-based study, the following operational effects are likely to be assessed:

- Displacement of target species (breeding raptors, black grouse, waders) around operational turbines;
- Potential collision risks associated with operational turbines for target species (most likely to be wildfowl, raptors, and waders); and
- Effects of lighting associated with turbines or other infrastructure on breeding, foraging, or migrating birds.

Proposed Assessment Methodology and Consultation

Proposed Assessment Methodology for Ornithological Features

- 4.2.149. The EIAR will include an Ornithological Impact Assessment (OIA). This will consider the potential direct, indirect, and cumulative effects that the construction, operation, and decommissioning that the Proposed Development could have on any identified Important Ornithological Features (IOFs) scoped into the assessment. The OIA will be supported by a technical appendix that will include details of survey methodologies, all survey data, and details from any collision modelling.
- 4.2.150. Effects on IOFs will be assessed in relation to the species' reference population, conservation status, range, and distribution. The assessment of potential effects will follow guidelines published by CIEEM (2018) and NatureScot (SNH 2017, 2018a).
- 4.2.151. The assessment involves the following process:
- Identifying the potential impacts of the Proposed Development;
 - Considering the likelihood of occurrence of potential impacts where appropriate;
 - Defining the Nature Conservation Importance (NCI) and conservation status of the bird populations present to determine overall sensitivity;
 - Establishing the magnitude of the likely impact (both spatial and temporal);
 - Based on the above information, making a judgement as to whether or not the identified effect is significant with respect to the EIA Regulations;
 - If a potential effect is determined to be significant, suggesting measures to mitigate or compensate the effect where required;
 - Considering opportunities for enhancement where appropriate; and
 - Reporting residual effects after mitigation, compensation, or enhancement.
- 4.2.152. NCI is defined on the basis of the geographic scale, and it is necessary to consider alongside each IOF's conservation status, its distribution and its population trend based on available historic records, to provide an overall level of sensitivity.
- 4.2.153. The significance of potential effects is determined by integrating the sensitivity and magnitude in a reasoned way.
- 4.2.154. A set of pre-defined significance criteria will be used in assessing the potential effects of the Proposed Development. It is necessary to establish whether there will be any effects which will be sufficient to adversely affect the feature to the extent that its conservation status deteriorates above and beyond that which would be expected should baseline conditions remain (i.e., the 'do nothing' scenario). Furthermore, these predictions will be given with a level of confidence relative to the effect being assessed where required (in line with CIEEM 2018).

Proposed Assessment Methodology for Significant Effects on an SPA

- 4.2.155. The method for assessing the significance of a likely effect on a SPA site is different from that employed for wider-countryside ornithological interests (detailed in section 0). The Habitats Directive is transposed into domestic legislation by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland). Regulation 48 includes a number of steps to be taken by the competent authority before granting consent (these are referred to here as an HRA). In order of application, the first four are:

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

4.2.156. It has already been established that the Proposed Development does not meet the criteria for Step 1.

4.2.157. The information for an assessment of Step 2: likely significant effects, and if required, Steps 3 (Appropriate Assessment) and 4 (integrity test) for the SPA in relation to the Proposed Development will be presented in the Ornithology Chapter of the EIAR and the results of baseline surveys and scientific conclusions presented in the chapter will be used to inform the appraisal process for the competent authority to conduct, if required.

Cumulative and in-combination Effects

4.2.158. An assessment of cumulative (and in the context of the HRA process, in-combination) effects will be undertaken following published guidance (SNH 2018b; 2016a). Cumulative/in combination effects on each IOF relevant to this Proposed Development will be assessed in relation to other projects and activities subject to the EIA process within a relevant search area and their effects on a relevant reference population; for example, at an NHZ level for breeding species.

Approach to Mitigation and Enhancement

4.2.159. Potentially significant effects on birds will be avoided/minimised where possible within the design layout process. Good practice during construction, operation and decommissioning of the Proposed Development will also be implemented.

4.2.160. Where likely significant effects on IOFs are identified, measures to prevent, reduce and where possible offset these adverse effects will be proposed.

4.2.161. Standard good practice measures (e.g., SNH 2019³²) will be applied to minimise any potential effects on birds. A Breeding Bird Protection Plan would be produced to make certain that all reasonable precautions are taken to ensure the relevant wildlife legislation is adhered to.

4.2.162. A suitably qualified Ecological Clerk of Works (ECoW) will conduct bird surveys prior to the commencement of, and during construction and decommissioning works to ensure all reasonable precautions are taken to avoid impacts on ornithological interests.

4.2.163. Species-specific measures during construction may also be required if there are any breeding/lekking black grouse within up to 750 m of the Development and/or any breeding Schedule 1/Annex 1 raptors and owls within up to 800 m of the Development, including

³² Scottish Natural Heritage joint publication. (2019). Good Practice during Wind Farm Construction. 4th Edition.

appropriate mitigation/monitoring and license application/consultation with SNH. This may include (but is not limited to):

- Black grouse
 - Reasonable precautions to ensure disruption to lekking black grouse is minimised by, for example, where possible, works within up to 750m of the lek areas undertaken outwith the black grouse breeding season (April to July); and
 - Restrictions on any works undertaken within 750m of the lek locations from April to July, in the hours around dusk and dawn.
- Breeding waders and Schedule 1/Annex 1 raptors and owls
 - Checks for breeding waders (out to 500m), raptors and owls (out to 800m) by a suitably qualified ornithologist prior to works undertaken between February (due to the presence of goshawk) and July;
 - Appropriate buffers applied to any breeding attempts located; and
 - Additional mitigation measures dependent on the outcomes of a risk assessment and site-specific conditions e.g., reduced speed limits and personnel to remain in vehicles along identified sections of tracks.

Effects Scoped Out of the Assessment

Species scoped out

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

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

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

Designated sites scoped out

4.2.166. Pre-application consultation with NatureScot (email dated 14th January 2020) confirmed that there was no likelihood of connectivity between the Proposed Development and the following designated sites which will be scoped out of the assessment:

- Inner Clyde SPA (underpinned by the Inner Clyde SSSI and associated Inner Clyde Ramsar);
- Renfrewshire Heights SPA (underpinned by Renfrewshire Heights SSSI);
- Black Cart SPA (underpinned by Black Cart SSSI);
- Castle Semple and Barr Lochs SSSI; and
- Loch Lomond SPA: Capercaillie will be scoped out, but Greenland white-fronted goose will be included as part of the HRA process.

Questions for Consultees

- Do consultees agree that the available historic data and range of baseline surveys carried out/proposed is sufficient and appropriate to conduct a robust impact assessment?
- Are there any other relevant consultees who should be contacted, or other information sources referenced, with respect to the ornithology assessment?
- Do consultees agree that the proposed assessment methods are suitable for conducting a robust impact assessment?
- Do consultees believe that there are any further key species which need to be considered in the assessment?
- Are you aware of any relevant policies or guidance documents not specifically mentioned in this section of the Report?

Geology, Hydrogeology, Hydrology and Soils

Introduction

- 4.2.167. This section outlines the proposed scope of the EIA to assess the significant effects from the Proposed Development on geology, hydrogeology, hydrology, and soils.
- 4.2.168. Much is already known about the Proposed Development site as a result of the previous Merkins Wind Farm planning application and the studies completed to inform that assessment. The scope of the proposed geology, hydrogeology, hydrology, and soils assessment reflects the previous studies and existing knowledge of the site and surrounding area.

Guidance

- 4.2.169. Relevant guidance, policy and legislation includes the following:

Legislation:

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

Policy:

- Scottish Planning Policy (SPP) (Scottish Executive, June 2014).
- West Dunbartonshire Council Local Development Plan

Guidance:

- Good Practice during Windfarm Construction, 4th Edition (Scottish Renewables, Scottish Natural Heritage (now NatureScot), Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science and AEECoW, 2019).
- Forests and Water Guidelines (Forestry Commission, 2012).

- Land Use Planning System – SEPA Guidance Note 31 (Guidance on Assessing Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems), Version 3, (SEPA, 11/09/2017).
- Control of Water Pollution from Linear Construction Projects – Technical Guidance, C648 (CIRIA, 2006).
- The SuDS Manual C753 (CIRIA, 2015).
- Environmental Good Practice on Site C741 (CIRIA, 2015).
- SEPA Regulatory Position Statement - Developments on Peat (Scottish Environment Protection Agency, 2010).
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, January 2017).
- Developments on Peatland - Guidance on the assessment of peat volumes, re-use of excavated peat and the minimisation of waste (Scottish Renewables & SEPA, 2012).
- Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland (Forestry Commission Scotland & Scottish Natural Heritage, 2010).
- Managing Geotechnical Risk: Improving Productivity in UK Building and Construction (Institution of Civil Engineers, 2001).
- Ground Engineering Spoil: Good Management Practice CIRIA Report 179 (CIRIA, 1997).
- Scottish Roads Network Landslides Study Summary Report (Scottish Executive, 2005).
- Guidelines for the Risk Management of Peat Slips on the Construction of Low Volume/Low-Cost Roads on Peat (Forestry Commission, 2006).

Existing Baseline Conditions

- 4.2.170. The Proposed Development is shown by the British Geological Survey (BGS) to be underlain by peat and glacial till deposits, with the hilltops locally shown to be absent of any superficial deposits. The peat deposits within the northern extent of the site are designated as Class 1 and Class 2 peatland (“nationally important carbon-rich soils). The bedrock beneath the site consists of several units of Carboniferous to Devonian aged sedimentary rocks (predominately sandstones) with several intrusive and extrusive igneous rocks.
- 4.2.171. The superficial deposits are unlikely to contain much groundwater but there is potential for groundwater to be present in the bedrock, and this may support private water supplies (PWS) and provide baseflow to watercourses locally. The sedimentary bedrock deposits are classified by the BGS as a moderately productive aquifer.
- 4.2.172. The Proposed Development is located within the surface water catchments of the River Leven to the west, the Endrick Water to the northeast and minor tributaries of the River Clyde to the southeast.
- 4.2.173. The entire catchment of the Duntocher Burn, a tributary of the River Clyde located to the southeast of the Proposed Development, has been designated as a Drinking Water Protected Area (DWPA). Several other DWPA are located within 1 km of the Proposed Development.

- 4.2.174. SEPA flood mapping confirms flood extents within the Proposed Development are typically confined to the watercourse corridors.
- 4.2.175. Review of NatureScot SiteLink website confirms that two Sites of Special Scientific Interest (SSSI) are located within site boundary including the Dumbarton Muir SSSI, designated for blanket bog and raised bog habitats, and Auchenreoch Glen SSSI, designated for lowland calcareous grassland and springs. Other designated sites are also noted in the catchments downstream of the Proposed Development.

Potentially Significant Effects

- 4.2.176. Particular emphasis will be given to potential effects on peat and carbon-rich soils where present, water quality, PWS and on changes to groundwater quality or quantity with respect to GWDTEs.
- 4.2.177. Potential impacts that will be considered include:
- Soil and peat erosion;
 - Damage to soil and peat from traffic movements and from handling, transport, and storage of excavated material;
 - Changes to water quality, including sediment release and accidental spillage of contaminants such as fuel or oils;
 - Changes to water quantity and flow paths, including installation of watercourse crossing structures;
 - Temporary and long-term drainage infrastructure;
 - Changes to PWS, either quality or quantity;
 - Changes to flood risk;
 - Changes to groundwater quality and flow paths; and
 - Changes to water supply to GWDTEs and water dependent habitat, such as Dumbarton Muir SSSI and Auchenreoch Glen SSSI.
- 4.2.178. Potential effects from construction, operation and decommissioning phases will all be assessed. Some of the potential impacts listed above are anticipated to have only a minor effect during operation of the Proposed Development. Cumulative and in-combination effects with relation to nearby developments will also be considered.

Proposed Assessment Methodology and Consultation

Desk Study

- 4.2.179. A desk study will be undertaken to confirm the baseline characteristics by reviewing available information relating to soils, peat, geology, hydrology, and hydrogeology. The study area will be the site and a 1 km buffer from the Proposed Development.
- 4.2.180. The desk study will review previous assessments undertaken in support of the Merkins Wind Farm planning application and supporting EIA, as well as from relevant neighbouring developments as much valuable and relevant information is likely to be contained in these reports and can be used to initially characterise the following: the depth and distribution of peat; the nature of the underlying geology; groundwater resources; licenced and unlicenced groundwater and surface water abstractions; public and PWS; surface water flows; flood extents; rainfall data; and water quality data.

- 4.2.181. The baseline assessment will include review of published geological maps, OS maps, aerial photographs digital terrain models (slope plans) and geological literature.
- 4.2.182. It is recognised that some of the information presented in previous reports may now be out of date and as part of the baseline assessment data requests would be made WDC, to the Scottish Environment Protection Agency and British Geological survey, in order that a contemporary assessment of baseline conditions can be made.
- 4.2.183. The desk study will be used to develop a conceptual site model which would then be used to identify sensitive features or receptors which may potentially be affected by the Proposed Development, and which might warrant further investigation as part of the proposed field surveys.

Field Study

- 4.2.184. The peat, geological and water assessment specialists will liaise closely with each other as well as with the project ecologists and wider project team to ensure that appropriate information is gathered to allow potentially sensitive features or receptors to be adequately assessed and a comprehensive impact assessment to be completed.
- 4.2.185. A programme of site visits and surveys will be undertaken to:
- verify the information collected during the desk study;
 - undertake a visual assessment of the main surface waters and identify PWS;
 - identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;
 - visit any identified GWDTs, Dumbarton Muir SSSI and Auchencroch Glen SSSI (in consultation with the project ecologists);
 - visit PWS sources that might be affected by the Proposed Development to confirm details of the location of the abstraction, its type and use;
 - prepare a schedule of potential watercourse crossings;
 - inspect rock exposures and establish by probing an estimate overburden thickness;
 - where required supplement existing soils / peat depth probing data to confirm areas of thick peat that may influence the Proposed Development in accordance with current best practice; and
 - confirm substrate beneath areas of peat based on the type of refusal of peat depth probe.

- 4.2.186. The desk study and field surveys will be used to identify potential development opportunities and constraints and be used to inform the site design.
- 4.2.187. Once the desk study and initial field surveys are complete and sensitive soil, geological and water features have been identified, an impact assessment will be undertaken.

Assessment of Environmental Impacts and their Significance

- 4.2.188. The purpose of the assessment will be to assess potential effects on soils, peat, geology, and the water environment (hydrology and hydrogeology) and specifically:
- identify any areas susceptible to peat slide, using site specific peat thickness and Digital Terrain Mapping (DTM) data to analysis slopes;
 - assist micro-siting turbines, tracks, and other proposed infrastructure in areas of no peat or shallow peat, and areas where there is little peat landslide hazard risk;

- if required show how any disturbed peat will be managed and safeguarded, by preparing a peat management plan;
- determine what the likely effects of the Proposed Development are on the hydrological regime, including water quality, flow, and drainage;
- allow an assessment of potential effects on identified licenced and PWS; and
- assess potential effects on water (including groundwater) dependent habitats.

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

- peat landside and hazard risk assessment;
- peat management plan;
- schedule of watercourse crossings;
- PWS risk assessment; and
- GWDTE risk assessment.

4.2.190. Cumulative Assessment

4.2.191. An assessment of the effects of the Proposed Development in combination with, and sequential to, other wind farms within 5 km of the site will be undertaken. The assessment will include operational wind farms, wind farms under construction, consented wind farms and wind farms at application stage. Wind farms at scoping stage will not be included.

4.2.192. Combined geological, hydrogeological, hydrological and soil effects of the Proposed Development with other wind farms will be assessed based on several factors. Due to the static nature of geology and soils, cumulative effects are likely to be negligible. Hydrogeological and hydrological effects will be assessed by the distance between the developments and flow directions/catchment areas. Designated sites will be assessed on their position in relation to all relevant developments.

4.2.193. Assessment Methodology

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

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

4.2.196. The sensitivity of the receiving environment (i.e., the baseline quality of the receiving environment as well as its ability to absorb the effect without perceptible change) and the magnitude of impacts will each be considered through a set of pre-defined criteria, details of which are outlined in **Table 4.8**.

Table 4.8: Sensitivity of receptor

Sensitivity of Receptor	Criteria
High	<ul style="list-style-type: none"> • SEPA Water Framework Directive Water Body Classification: High - Good or is close to the boundary of a classification Moderate to Good or Good to High; • receptor is of high ecological importance or national or international value (e.g., SSSI, Special Area of Conservation (SAC), habitat for protected species) which may be dependent upon the geology or hydrology of the development area; • receptor is at high risk from flooding above 0.5% Annual Exceedance Probability (AEP) and/or water body acts as an active floodplain or flood defence; • receptor is used for public and/or PWS (including Drinking Water Protected Areas (DWPA)); • groundwater vulnerability is classified as high; and • if a GWDTE is present and identified as being of high sensitivity.
Medium	<ul style="list-style-type: none"> • SEPA Water Framework Directive Water Body Classification Moderate or is close to the boundary of a classification Low to Moderate; • receptor is at moderate risk from flooding (0.1% AEP to 0.5% AEP) but does not act as an active floodplain or flood defence; and • moderate classification of groundwater aquifer vulnerability.
Low	<ul style="list-style-type: none"> • SEPA Water Framework Directive Water Body Classification Poor or Bad; • receptor is at low risk from flooding (less than 0.1% AEP); and • receptor not used for water supplies (public or private).
Negligible	<ul style="list-style-type: none"> • receptor is not affected by the Proposed Development e.g., lies within a different and unconnected hydrological / hydrogeological catchment.

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

Approach to Mitigation

4.2.198. The Proposed Development will undergo design iterations and evolution in response to constraints identified as part of the baseline studies and field studies so as to avoid and/or minimise potential effects on receptors where possible. This will include geological and hydrological and hydrogeological constraints which include slope stability, deep peat, watercourse locations, areas of potential flooding, PWS and GWDTE.

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

- a buffer of up to 50 m will be applied to watercourses;
- site specific peat probing will be used to identify areas of potential deep peat, and these will be avoided;

- a site-specific peat landslide and hazard risk assessment will be prepared, and areas of potential increased peat slide risk will be avoided;
 - if required, a peat management plan will be prepared to show how the integrity of peat will be safeguarded; and
 - impacts on PWS sources and areas of GWDTE will be avoided.
- 4.2.200. There is much best practice guidance which has been developed to assist developers minimise the risks associated with wind farm construction, operation, and decommissioning and this will be used to develop site specific mitigation measures. Measures will be proposed to control and mitigate, for example, pollution risk (from anthropogenic and geogenic sources), flood risk, watercourse crossings, impacts on surface and groundwater flow paths, and management of peat soils.
- 4.2.201. Mitigation measures will be specified for all stages of the site life (construction, operation, and decommissioning).
- 4.2.202. Good practice measures will be applied in relation to pollution risk, and management of surface run-off rates and volumes. This will form part of the final CEMP to be implemented for the Proposed Development.

Enhancement

- 4.2.203. Opportunities for enhancement of the geology, hydrogeology, hydrology, and soils will form part of the assessment. For example, it might be possible to identify areas for habitat and peat restoration, peat re-wetting, upgrade of existing culverts to alleviate flood risk and potential barriers to fish migration etc.
- 4.2.204. To identify opportunities for enhancement, the project geologists, hydrologists, ecologists, and the wider project team will work closely together and attend combined project workshops and design meetings.

Effects Scoped Out of the Assessment

- 4.2.205. It is proposed to scope out effects on geology. While there will be effects arising from rock extraction for borrow pits, track construction and for turbine and crane pad areas, these are limited in area and do not extend beyond the immediate development footprint. No particularly sensitive geological features have been identified within the study area.

Questions for Consultees

- Published mapping confirms that most of site area is not identified as being at flood risk. It is proposed, therefore, that a simple screening of potential flooding sources (fluvial, coastal, pluvial, groundwater etc.) is presented in the EIAR. Is this approach acceptable?
- It is not proposed to prepare a detailed drainage design. Rather measures that would be used to control the rate and quality of runoff will be specified in the EIAR. Again, is this acceptable?
- Site investigations, including detailed peat probing and private water survey, will be undertaken as part of the proposed assessment. Should any additional investigation or data sources be considered when assessing baseline conditions?
- It is not proposed to undertake any water quality sampling, establish groundwater monitoring points, surface water monitoring points, or undertake leachability trials of any rock as there is published data that can be used to characterise baseline conditions and complete the impact. Is this acceptable?

- Is there any specific investigation required to complete the assessment of effect on Dumbarton Muir SSSI and Auchenreoch Glen SSSI?
- Please advise if there is any specific information or methodology that should be used / followed as part of the PWS risk assessment?
- Do you agree that the scope of the proposed assessment is appropriate?

Noise and Vibration

Introduction

4.2.206. Noise can arise from the construction, operation, and the decommissioning phases of wind farms. The noise assessment will therefore evaluate the effects of each of these phases on nearby noise sensitive receptors.

Guidance

4.2.207. The following policies are of relevance to the noise assessment:

- Scottish Planning Policy (2014);
- Planning Advice Note PAN1/2011 and associated Technical Advice Note; and
- Onshore Wind Turbines (web-based planning advice note)

4.2.208. SPP requires consideration of potential noise impacts for wind farm developments but provides no specific advice on noise. Planning Advice Note PAN1/2011 provides general advice on preventing and limiting the adverse effects of noise without prejudicing economic development. It makes reference to noise associated with both construction activities and operational wind farms.

4.2.209. The web-based planning advice note on 'Onshore wind turbines' provides further advice on noise and confirms that the recommendations of ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms' "*should be followed by applicants and consultees and used by planning authorities to assess and rate noise from wind energy developments*".

Existing Baseline Conditions

4.2.210. The Proposed Development is located within Kilpatrick hills south of LLTNP, adjoining Auchencarroch landfill site directly to the west, and approximately 2.5 km west of Bonhill. The noise environment in the surrounding area is expected to be characterised by mainly 'natural' sources, such as wind disturbed vegetation, birds and farm animals, with a varying influence of noise from distant local roads, agricultural activities and water courses in some cases.

4.2.211. For the EIA, the baseline environment would generally be assessed by measuring background noise levels as a function of site wind speed at the nearest noise sensitive neighbours (or, at a representative sample of the nearest neighbours), as required under ETSU-R-97, 'The Assessment and Rating of Noise from Wind Farms'.

4.2.212. But ETSU-R-97 also offers an alternative simplified assessment methodology: if predicted noise levels do not exceed 35dB(A) up to 10 m/s, then they are considered acceptable and background noise surveys are not considered necessary. In cases where it is considered likely that turbine noise levels would not exceed this threshold, based on worst-case assumptions, this simplified approach would be used instead.

4.2.213. Any additional baseline measurement locations, if required, will be selected in consultation with the Environmental Health Department of WDC.

Potentially Significant Effects

Initial Findings

- 4.2.214. Using the current design an initial noise model has been generated to identify the likelihood of noise sensitive receptors being exposed to noise levels above 35 dB LA90. This value is set out in The Institute of Acoustics Good Practice Guide as a means for determining a study area. The guide advises *'The study area should cover at least the area predicted to exceed 35 dB LA90 at up to 10 m/s wind speed from all existing and proposed turbines'*.
- 4.2.215. In addition, for financially involved dwellings, the following is advised *'ETSU-R-97 considers it appropriate to allow a higher level of incident noise associated with turbine operation for properties with occupants that have an interest in the development, both as a higher fixed level (45 dB) and/or a higher level above the prevailing background noise level. It is considered that the occupants of a financially involved property should be direct beneficiaries to allow an increase to the fixed limit noise levels.'*
- 4.2.216. Initial noise predictions show that all receptors are likely to be outside the 35 dB(A) contour. Although background noise monitoring is not typically required at properties beyond the 35 dB(A) contour, we would propose undertaking a series of noise measurements at locations representative of the closest receptors.
- 4.2.217. During construction and decommissioning, noise could arise from both on-site activities, such as the construction of access tracks, turbine foundations, control building and substation, and quarrying of borrow pits and from the movement of construction related traffic both on site and travelling on public roads to and from the Proposed Development.
- 4.2.218. Traffic volumes associated with operation of the Proposed Development is expected to be relatively low. Similarly, given the nature of works involved in the construction of a wind farm and distances to neighbouring dwellings, the risk of significant effects relating to ground-borne vibration during construction is generally very low.
- 4.2.219. During their operation, wind farms have the potential to create noise effects through both aerodynamic noise and mechanical noise. Aerodynamic noise would be caused by the interaction of the turbine blades with the air. Mechanically generated noise would be caused by the operation of internal components, such as, the gearbox and generator, which are housed within the nacelle of the turbine. However, the level of mechanical noise radiated from current technology wind turbines is generally engineered to a low level. The assessment of operational noise will also include the cumulative effects of other turbines in the area.
- 4.2.220. With regard to infrasound and low frequency noise, the above-referenced online planning advice note, Onshore wind turbines, refers to a report for the UK Government which concluded that *'there is no evidence of health effects arising from infrasound or low frequency noise generated by the wind turbines that were tested.'* The current recommendation is that ETSU-R-97 should continue to be used for the assessment and rating of operational noise from wind farms.

4.2.221. It is therefore not proposed to undertake specific assessments of infrasound and low frequency noise, but the noise chapter of the EIA will consider the latest supporting information on these subjects and the topic of wind turbine blade swish or Amplitude Modulation (AM).

Proposed Assessment Methodology and Consultation

4.2.222. In summary, the assessment using the ETSU-R-97 guidance shall:

- Identify the nearest noise sensitive receptors;
- Determine the quiet day time and night-time noise limits from the measured background noise levels at the nearest neighbours (see below);
- Specify the type and noise emission characteristics of the wind turbines planned for the Proposed Development;
- Calculate noise emission levels which would be due to the operation of the wind turbines as a function of site wind speed at the nearest neighbours, including the cumulative effect of all turbines; and
- Compare the calculated wind farm noise emission levels with the derived ETSU-R-97 noise limits.

4.2.223. Good practice in the application of the ETSU-R-97 methodology will be referenced, as set out in Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97. This includes guidance on the baseline survey, wind shear assessment and noise prediction methodology.

4.2.224. PAN1/201151 and accompanying Technical Advice Note provide further advice on construction noise and make reference in particular to British Standard BS 5228. Furthermore, the Control of Pollution Act 1974 provides different means for local authorities of controlling construction noise and vibration.

4.2.225. In assessing the impact of noise and vibration from the construction and decommissioning activities, it is usual to accept that the associated works are of a temporary nature. The assessment of potential effects due to noise emissions during construction and decommissioning will be undertaken in accordance with the BS 5228 British Standard guidance 'Code of practice for noise and vibration control on construction and open sites: Noise'. Predictions of construction noise will be made referencing typical activity emission levels and likely variations in noise levels at surrounding receiver locations, using the methodology set out in BS 5228 Part 1. Part 2 of the BS 5228 standard considers construction vibration, and this will also be referenced. Any blasting if used for rock extraction at borrow pits may also create vibration and air overpressure which may require assessment.

4.2.226. Consideration will also be given to the potential impact of construction traffic on sensitive receptors in the area. Depending upon the outcome of the assessment of traffic for the Traffic and Transportation chapter of the EIA, the impact of traffic noise along the site access route will be assessed on the basis of the methodology within BS 5228-1, and the 'Calculation of Road Traffic Noise' publication, where appropriate.

4.2.227. The assessment of construction noise and vibration will identify if and when predicted noise levels may be above standard guideline limits, taking into account the rural character of the site and surrounding area. For construction traffic, the criteria set out in the Design Manual for Roads and Bridges are also likely to be referenced. Construction noise management procedures will also be determined.

Approach to Mitigation

- 4.2.228. The assessment of the temporary effects of construction and decommission noise is primarily aimed at understanding the need for dedicated management measures and, if so, the types of measures that are required. In this respect, relevant working practices, traffic routes, and proposed working hours will be considered in the assessment.
- 4.2.229. The layout of the Proposed Development will be iteratively developed in such a way that applicable noise limits, as determined in line with the ETSU-R-97 guidelines referenced above, can be achieved at all neighbouring noise-sensitive (residential) locations based on a representative candidate turbine model, whilst maintaining as far as possible the generation capacity of the Proposed Development (in addition to other design considerations).

Effects Scoped Out of the Assessment

- 4.2.230. It is recognised that vibration resulting from the operation of wind farms is imperceptible at typical separation distances. It is therefore proposed to scope out the assessment of vibration produced during the operation of the Proposed Development. Regarding construction vibration impacts, it is considered unlikely that the construction programme for sites considered in the cumulative study, and the location of the works (and/or access tracks) is likely to overlap such that additional significant cumulative impacts would arise. It is therefore proposed to scope out consideration of cumulative construction noise and vibration effects.

Questions for Consultees

- Do you agree with the proposal to scope out the assessment of operational vibration and cumulative construction effects?
- Do you agree with our proposals for the noise assessment?

Traffic and Transportation

Introduction

- 4.2.231. The section covers the predicted transport and access issues that may arise from the construction of the Proposed Development, the significance of these effects and what suitable mitigation can be put in place to avoid, minimise, or offset adverse effects.
- 4.2.232. The Transport and Access EIAR Chapter will be supported by a reduced scope Transport Assessment report, Abnormal Load Route Survey, and technical figures.
- 4.2.233. The key issues for consideration as part of the assessment will include:
- The temporary change in traffic flows and the resultant, temporary effects on the study's road network during the construction phase;
 - The physical mitigation associated with the delivery of abnormal loads;
 - The design of new access infrastructure; and
 - The consideration of appropriate and practical mitigation measures to avoid, minimise or offset temporary effects.
- 4.2.234. The potential effects of these will be examined in detail.

Guidance

- 4.2.235. The following policy and guidance documents will be used to inform the Transport and Access Chapter:
- Transport Assessment Guidance (Transport Scotland, 2012);
 - The Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment, 1993); and
 - Scottish Planning Policy (Scottish Government, 2014).

Existing Baseline Conditions

- 4.2.236. The Proposed Development will be accessed directly from the public road network using a purpose-built access junction. Loads will then proceed to the proposed turbine locations using upgraded and new access tracks.
- 4.2.237. It is proposed that all vehicular access will use the proposed access route, including Abnormal Indivisible Loads (AIL). A detailed Route Survey Report will support the application and will identify the necessary access improvements that will be required to enable loads to access the site from the A813 corridor. This will include an initial Electronic Service Delivery for Abnormal Loads weight review for structures on the proposed access route from King George V Docks in Glasgow to the site via the strategic trunk road and local road networks.
- 4.2.238. There are currently several route options being considered for AIL access. A finalised route will be determined and advised upon completion of the AIL route survey.
- 4.2.239. Locally sourced material will be used where feasible, and traffic will avoid impacting on local communities as far is possible.

Survey Methodology

- 4.2.240. Baseline traffic count data will be obtained from a new Automatic Traffic Count survey located on one or more appropriate locations on the local road network (once the proposed access route is defined).
- 4.2.241. Further traffic data for the local road network will be obtained from UK Government Department for Transport (DfT) traffic count data, the Traffic Scotland database or from specifically commissioned traffic surveys. National Road Traffic Forecast (NRTF) Low Traffic Growth assumptions will be used to provide a common future year baseline to coincide with the expected construction traffic peak.
- 4.2.242. Traffic accident data will be obtained from Crashmap UK for the study network to inform the accident review for the immediate road study area. Three years' worth of data will be collated for roads within the study area.

Potentially Significant Effects

Construction

- 4.2.243. The Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993) sets out a methodology for assessing potentially significant environmental effects. In accordance with this guidance, the scope of assessment will focus on:

- Potential impacts (of changes in traffic flows) on local roads and the users of those roads; and
 - Potential impacts (of changes in traffic flows) on land uses and environmental resources fronting these roads, including the relevant occupiers and users.
- 4.2.244. The following rules taken from the guidance will be used as a screening process to define the scale and extent of the assessment:
- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles (HGVs) is predicted to increase by more than 30%); and
 - Rule 2: Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.
- 4.2.245. Increases below these thresholds are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level predicted as a consequence of the Proposed Development will therefore be assumed to result in no discernible environmental impact and as such, no further consideration will be given to the associated environment effects.
- 4.2.246. The estimated traffic generation of the Proposed Development will be compared with baseline traffic flows, obtained from existing traffic survey data, in order to determine the percentage increase in traffic.
- 4.2.247. Potentially significant environmental effects will then be assessed where the thresholds are exceeded. Suitable mitigation measures will be proposed, where appropriate.
- 4.2.248. It is not anticipated that a formal Transport Assessment will be required as these are not generally considered necessary for temporary construction works. A reduced scope Transport Assessment is therefore proposed.
- 4.2.249. Each turbine is likely to require between 11 and 14 abnormal loads to deliver the components to site. The components will be delivered on extendable trailers which will then be retracted to the size of a standard HGV for the return journey.
- 4.2.250. Detailed swept path analyses will be undertaken for the main constraint points on the route from the port of entry through to the site access junction to demonstrate that the turbine components can be delivered to site and to identify any temporary road works which may be necessary.
- 4.2.251. Standard mitigation measures that are likely to be embedded in the assessment are:
- 4.2.252. Production of a Construction Traffic Management Plan;
- The design of suitable access arrangements with full consideration given to the road safety of all road users;
 - A Staff Sustainable Access Plan; and
 - A Framework Abnormal Load Transport Management Plan.
- 4.2.253. Additional mitigation will be included should the assessment reveal criteria that are significant following the application of standard mitigation measures.
- 4.2.254. Potential impacts are detailed in **Table 4.9**.

Table 4.9: Potential impacts during construction

Characteristic of Proposed Development	Receptor	Potential Impact
Increased levels of overall traffic	Road users and residents	Increases in traffic over 30% or 10% in sensitive areas / receptors
Increased levels of HGV traffic	Road users and residents	Increases in traffic over 30% or 10% in sensitive areas / receptors

Operation

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

Decommissioning

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

Cumulative Impacts

4.2.257. Committed development traffic, i.e., those from nearby proposals with planning consent, will be included in baseline traffic flows, where traffic data for these schemes is considered significant and is publicly available. Developments that are proposed or at Scoping would not be included.

Proposed Assessment Methodology and Consultation

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

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

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

Sensitivity of Receptor

- 4.2.260. The IEMA ‘Guidelines for Environmental Impact Assessment’ (2005) notes that the separate ‘Guidelines for the Environmental Assessment of Road Traffic’ (1993) document should be used to characterise the environmental traffic and transport effects (off-site effects) and the assessment of significance of major new developments. The guidelines intend to complement professional judgement and the experience of trained assessors.
- 4.2.261. In terms of traffic and transport impacts, the receptors are the users of the roads within the study area and the locations through which those roads pass.
- 4.2.262. The sensitivity of receptors is detailed in **Table 4.10**.

Table 4.10: Sensitivity of receptor criteria

Sensitivity of Receptor	Criteria for Road Users
High	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs
Medium	Where the road is a local A or B class road, capable of regular use by HGV traffic
Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition
Negligible	Where roads have no adjacent settlements.
Sensitivity of Receptor	Criteria for Residents / Locations
High	Where a location is a large rural settlement containing a high number of community and public services and facilities
Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services
Low	Where a location is a small rural settlement, few community or public facilities or services
Negligible	Where a location includes individual dwellings or scattered settlements with no facilities

Magnitude of Impact

- 4.2.263. The IEMA Guidelines identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development: the impacts and levels of magnitude are discussed below:
- Severance – the IEMA Guidance states that, “*severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery.*” Further, “*Changes in traffic of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ [or minor, moderate, and major] changes in severance respectively*”. However, the Guidelines acknowledge that “*the measurement and prediction of severance is extremely difficult.*”
 - Driver delay – the IEMA Guidelines note that these delays are only likely to be “*significant [or major] when the traffic on the network surrounding the development is already at, or close to, the capacity of the system.*”

- Pedestrian delay – the delay to pedestrians, as with driver delay, is likely only to be major when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. An increase in total traffic of approximately 30% can double the delay experienced by pedestrians attempting to cross the road and would be considered major;
- Pedestrian amenity – the IEMA Guidelines suggests that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its lorry component) is halved or doubled. It is therefore considered that a change in the traffic flow of -50% or +100% would produce a major change in pedestrian amenity;
- Fear and intimidation – there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30%, 60% and 90% are regarded as producing minor, moderate and major changes respectively; and
- Accidents and safety – professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents.

4.2.264. While not specifically identified, as more vulnerable road user, cyclists are considered in similar terms to pedestrians.

4.2.265. To determine the overall significance of effects, the results from the receptor sensitivity and magnitude of change assessments are correlated and classified as set out below.

Significance of Effect

4.2.266. The sensitivity of the receptor together with the magnitude of the effect defines the significance of the effect, which will be categorised into level of significance (**Table 4.11**).

Table 4.11: Significance of effect matrix

Importance of Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major/Moderate	Moderate/Minor	Minor
Medium	Major/Moderate	Moderate	Minor	Minor/Negligible
Low	Moderate/Minor	Minor	Minor/Negligible	Minor/Negligible
Negligible	Minor	Minor/Negligible	Minor/Negligible	Negligible

4.2.267. Following the assessment, further mitigation measures may be required to address site specific issues. These are likely to include the following:

- Section 96 Agreement of the Roads (Scotland) Act to protect the public road against abnormal wear and tear in the study area;
- Potential widening of local roads in the vicinity of the site to allow for AIL and other construction deliveries;

- Design of the site access junction to ensure that approved access routes are adhered to; and
- Enhanced temporary construction warning and direction signage.

4.2.268. Details of these measures will be detailed in the Transport Assessment.

Effects Scoped Out of the Assessment

4.2.269. The operational and decommissioning phases of the Proposed Development are proposed to be scoped out as the construction phase represents the greatest impact with regards to transport movements to and from the site.

Questions for Consultees

- Is the proposed methodology considered acceptable?
- Are the methods proposed for obtaining traffic flow data acceptable?
- Is the use of Low NRTF acceptable for the whole of the study?
- What cumulative traffic flows from committed development should be included in the assessment?

Other Issues

Aviation

4.2.270. Introduction

4.2.271. Wind turbines have the potential to affect the performance of radars used for air traffic control, air defence and meteorological forecasting. They can also present an obstacle hazard to aircraft flying at low altitude and may affect the specified minimum altitudes for aircraft flying instrument approach procedures at airports.

4.2.272. Legislation, Policy, and Guidance

4.2.273. The aviation assessment will be conducted with reference to the following legislation, policy, and guidance:

4.2.274. Legislation:

- Civil Aviation Act 1982;
- The Air Navigation Order 2016 (as amended in September 2021);
- The Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) (Scotland) Direction 2016.

4.2.275. Policy:

- Scottish Planning Policy (2014);
- Scottish Government Onshore Wind Policy Statement (December 2017);
- Scottish Onshore Wind Policy Statement Refresh 2021: Consultative Draft;
- CAA Policy and Guidelines on Wind Turbines (CAP 764);
- CAA Policy Statement: 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 (June 2017).

4.2.276. Guidance:

- CAA Air Traffic Services Safety Requirements (CAP 670);

- International Civil Aviation Organisation (ICAO), Annex 14 to the Chicago Convention, Vol.1, Eighth Edition (2018);
- ICAO Doc 8168: Procedures for Air Navigation Services: Aircraft Operations, Volume II – Construction of Visual and Instrument Flight Procedures, Seventh Edition (2020).

4.2.277. Existing Baseline Conditions

4.2.278. The Proposed Development site lies approximately 11 km north of Glasgow Airport and is wholly contained within the controlled airspace of the Glasgow Control Zone. The principal aviation effects of the Proposed Development are expected to be related to Glasgow Airport, including effects on primary surveillance radar, obstacle limitation surfaces, instrument flight procedures, visual flying routes, and obstacle lighting.

4.2.279. Other expected aviation issues include NATS En Route primary surveillance radars and Meteorological Office radars.

4.2.280. The proposed turbines will exceed 150 m blade tip height and will therefore be subject to mandatory aviation obstruction lighting in accordance with Article 222 of the Air Navigation Order or, due to the proximity to Glasgow Airport, in accordance with Section 47 of the Civil Aviation Act 1982.

4.2.281. Proposed Assessment Methodology and Consultation

Desk Study

4.2.282. The aviation baseline will be determined using the UK Aeronautical Information Publication (AIP), the UK Military AIP and aeronautical charts.

Radar modelling

4.2.283. The line of sight from primary surveillance radars within the Study Area will be modelled using specialist software.

Obstacle assessment

4.2.284. Assessment of the effects of the Proposed Development on Glasgow Airport obstacle limitation surfaces, instrument flight procedures and visual flying routes will be carried out by mapping the locations and heights of the proposed turbines against the features of Glasgow Airport's airspace and procedures as published in the UK AIP.

4.2.285. Infringements of obstacle limitation surfaces will be assessed against the criteria set out in UK Certification Specification & Guidance Material for Aerodrome Design, CS-ADR-DSN, for Regulation (EU) No. 139/2014 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018.

4.2.286. Effects on instrument flight procedures will be assessed against the criteria set out in ICAO Doc 8168.

4.2.287. Effects on visual flying routes will be assessed against the criteria set out in the (UK) Standardised European Rules of the Air and its exceptions set out in the CAA Official Record Series 4.

Meteorological Office radars

4.2.288. Effects on Meteorological Office radars will be assessed by modelling the distance and elevation of the proposed turbines from the nearest such facility.

Assessment Methodology

- 4.2.289. Significance criteria for assessment of impacts on aviation, unlike those for environmental effects, are not based on the sensitivity of the receptor. Further, while magnitude of change can be determined in some circumstances, it typically does not provide a standardised metric on which to measure the significance of any effects. In this context, the significance of effects on aviation will be determined by application of professional judgement, underpinned by consideration of the magnitude of change (where measurable), the regulations and procedures in place for ensuring that aviation infrastructure meets required performance standards, the safeguarding policies, and practices in use by specific aviation stakeholders, and the consultation responses from those stakeholders.
- 4.2.290. It is proposed to use the criteria set out in **Table 4.12** to assess the significance of aviation effects.

Table 4.12: Significance of effect criteria

Significance	Criteria
Major	Regular, frequent, or permanent effects which require changes to existing operational and/or technical practice in order to mitigate adequately, or which are not capable of being mitigated adequately.
Moderate	Periodic effects experienced which may require alterations to existing operational practice.
Minor	Occasional effects experienced which do not require any alteration of existing operational and technical practice.
Negligible	Normally no measurable change from baseline conditions; occasional, fleeting or very short-term effects experienced which do not require any alteration of existing operational and technical practice.
Nil	No measurable change from baseline conditions.

Forestry

Introduction

- 4.2.291. There is potential for effects on areas of woodland/forestry during the construction, operation, and decommissioning of the Proposed Development. This section details the way in which potential effects of the Proposed Development on the woodland/forestry areas within the site will be assessed. It is not proposed to dedicate a specific assessment chapter within the EIAR to deal with this aspect; however, it will be assessed where relevant in other technical chapters, primarily ecology, LVIA and hydrology.

Guidance

- 4.2.292. In Scotland, permanent deforestation is dealt with under the Scottish Government's "Control of Woodland Removal Policy" (Forestry Commission Scotland, 2009). The purpose of the policy is to provide direction for decisions on woodland removal in Scotland.
- 4.2.293. National policy and guidance:

- Scottish Executive (2006) Scottish Forestry Strategy;
- Planning and development: trees and woodland (NatureScot).
- NatureScot (2019) Bats and onshore wind turbines - survey, assessment, and mitigation;
- Right Tree in the Right Place - Planning for Forestry & Woodlands 2010,
- Forestry Commission Scotland (2009) Control of Woodland Removal;
- Guidance to Forestry Commission Scotland Staff on implementing the Scottish Government Policy on control of woodland removal, March 2015.
- Woodland Trust Scotland (2019) Planning for Ancient Woodland: Planners' Manual for Ancient Woodland and Veteran Trees. Practical Guidance – Scotland;
- Impacts of nearby development on the ecology of ancient woodland. Corney et al. 2008.
- The Scottish Planning Policy 2014;
- National Planning Framework 3 (NPF3) 2014; and
- Climate Change (Scotland) Act 2009.

4.2.294. Local policy and guidance:

- West Dunbartonshire Council (2020) Local Development Plan 2; and
- West Dunbartonshire Council (2016) Planning Guidance: Renewable Energy.

Existing Baseline Conditions

Designations

4.2.295. **Table 4.13** includes all of the areas of ancient woodland (AWI) within the site. These areas are shown on Figure 4.2.4a.

Table 4.13: Ancient woodland within the site

AWI Site Name	Antiquity	Area	Location
Barr Wood	Long Established (of plantation origin)	15.12 ha	Southwestern boundary of site
Murroch Glen	Ancient (of semi-natural origin)	23.61 ha	Southwestern boundary of site
Unnamed	Ancient (of semi-natural origin)	2.86 ha	Within the western extent of the site
Unnamed	Ancient (of semi-natural origin)	2.09 ha	Within the western extent of the site
Unnamed	Ancient (of semi-natural origin)	1.45 ha	Northeast boundary of site
Unnamed	Ancient (of semi-natural origin)	7.28 ha	Northeast boundary of site
Unnamed	Ancient (of semi-natural origin)	14.07 ha	Northeast boundary of site
Unnamed	Ancient (of semi-natural origin)	3.95 ha	Northwest boundary of site

4.2.296. The Scottish Forestry Map Viewer³³, identifies Barr Wood as Native Woodland primarily made up of two distinct parallel old boundary/hedgerows consisting of beech trees. It has not been surveyed to confirm if the site is Plantation on Ancient Woodland Site. The results of the habitat survey undertaken as part of the ecology assessments will be analysed to confirm if onsite vegetation supports the native woodland classification. The results of this process will be submitted as part of a technical appendix to the EIAR.

4.2.297. Parts of Murroch Glen and Barr Wood are also covered by a Tree Preservation Order.

Commercial Forestry

4.2.298. The national forestry inventory identified areas of conifer plantation adjacent to the east and west boundaries of the site. There is an area of assumed woodland along the southwest boundary of the site.

Site Survey

4.2.299. A site survey was undertaken on 9 March 2022 to collect mensuration data relating to the commercial plantation within the vicinity of T19 and to survey the Barr Wood AWI. The survey results confirmed:

- Barr Wood AWI comprises two distinct parallel old boundary/hedgerows consisting of Beech and Scots Pine trees. No internal trees were evident onsite; and,
- The area of conifer forestry to the west of the site (in the vicinity of T19) comprises mature trees with an average height of 26 m. There was evidence that the forestry was beginning to suffer from wind throw.

Potential Impacts, Proposed Assessment Methodology and Consultation

4.2.300. The Scottish Government's Control of Woodland Removal Policy includes a presumption in favour of protecting woodland. Removal should only be permitted where it would achieve significant and clearly defined additional public benefits. Where woodland is removed in association with development, developers will generally be expected to provide compensatory planting. In cases of woodland with a strong presumption against removal, such as ancient woodland, the compensatory planting area must exceed the area of woodland removed to compensate for the loss of environmental value.

4.2.301. The main forestry consultee is Scottish Forestry who will be consulted throughout the development of the proposals to ensure that the proposed changes to the woodlands are appropriate and address the requirements of the Control of Woodland Removal Policy and UK Forestry Standard Guidelines.

Conifer Plantation

4.2.302. The Proposed Development has the potential for woodland loss. Forestry is considered a key habitat feature for bats, which are protected under law. NatureScot guidance recommends a 50 m buffer between key habitat features, including forestry, and the swept path of the turbine blades to mitigate potential impacts on bats. A wind protection zone will be included in the design to ensure that there is a 50 m buffer between bat habitat features and the swept path of the turbines. It is expected that the site layout will evolve and potential impacts on the conifer forestry could be avoided by design. However, should felling be required to maintain a wind protection zone resulting in an anticipated

³³ <https://forestry.gov.scot/support-regulations/scottish-forestry-map-viewer> [accessed March 2022]

loss of conifer forestry then a Wind Farm Forest Design Plan will be presented in a separate factual Technical Appendix, using the following approach, together with a summary in the main Project Description and the description of the design evolution:

- The forestry baseline will describe the crops existing at time of preparation of the EIAR. This will include total area, species composition; age class structure, yield class, other relevant crop information, baseline felling and restocking plans, as available. The baseline will be prepared from existing records, site surveys and aerial photography;
- The changes to the forest structure resulting from the incorporation of the Proposed Development will be described within the Wind Farm Forest Design Plan. This will include the changes to, for example, the woodland composition and felling programmes;
- The changes to the woodland structure will be analysed and described including changes to species composition, age class structure, timber production, traffic movements and the felling and restocking plans. The resulting changes to the woodland structure and any requirement for compensation planting for any woodland loss will be considered in the context of the Control of Woodland Removal Policy and in consultation with Scottish Forestry; and
- Information will be presented in text, tables, and diagrams together with maps, as necessary.

4.2.303. Commercial forestry is not regarded as a receptor for a formal impact assessment, so a standalone EIA Chapter is not considered necessary. The effects of the changes to forest design as a result of the Proposed Development will be considered within the relevant chapters of the EIAR.

4.2.304. Opportunities for compensatory planting and/or habitat improvement will be outlined in conjunction with the Ecology Chapter of the EIAR. This will include consideration of potential effects from the proposed planting upon other disciplines covered within the EIAR.

Ancient Woodland

4.2.305. There is potential for direct impacts on AWI as a result of woodland loss for the construction and operation of the Proposed Development. Development can also have the following indirect effects on AWI:

- Chemical effects (e.g., soil acidification)
- Disturbance (including noise, vegetation clearance, light and dust pollution, trampling, grazing)
- Habitat and landscape fragmentation
- Invasion by non-native plant species
- Impacts from domestic pets
- Reducing the amount of semi-natural habitats next to AWI
- Changes to the water table or drainage
- Changes to surrounding landscape character
- Cumulative effects

4.2.306. Potential direct impacts on the unnamed AWI sites would be avoided by design. A buffer equivalent to the wind protection zone will be adopted for wind turbines and a 15 m buffer (i.e., the root protection zone) for ancillary infrastructure would be adopted. Potential indirect impacts on the unnamed AWI sites are unlikely as the total land take would be

relatively small, best practice measures would be adopted as part of a construction environmental management plan, and there would be negligible activity onsite during the operational phase.

- 4.2.307. There is the potential for direct and indirect (fragmentation) impacts on the Murroch Glen and Barr Wood AWI sites as a result of permanent woodland loss associated with potential site access. Woodland loss would be minimised by routing the site access between the parallel old boundary/hedgerows as far as practicable. Woodland translocation would be proposed to compensate for the loss of any ancient woodland. This is process of moving woodland trees and soils from one location to another, allowing soil microbial communities, mycorrhizae and seed banks which have developed over hundreds of years to survive and to re-establish. Trees are removed, followed by soil on a layer-by-layer basis, the leaf layer is moved first, followed by topsoil, with each layer being kept separate and moved to a carefully prepared receptor site. The receptor site must be comparable to the original site from where the woodland soil was taken from.
- 4.2.308. The Woodland Trust guidance states that if development is likely to harm ancient woodland or veteran trees, unequivocal and credible evidence should be prepared to justify the exceptional need and benefits for the development. The need case for the Proposed Development and an assessment of its compliance with relevant policies and guidance will be presented in the planning statement.

Questions for consultees:

- Do consultees consider woodland translocation as a suitable proposal for compensatory planting?
- Do consultees agree that a 15 m root protection zone is a suitable buffer from AWI for ancillary development?
- Do consultees agree that impacts on the unnamed AWI can be scoped out?

Telecommunications and Electromagnetic Interference

Introduction

- 4.2.309. Tall structure such as buildings and wind turbines can adversely affect the performance of fixed telecommunications links, if positioned close enough to those links.

Guidance

- 4.2.310. Standards for the separation of wind turbines from fixed telecommunications links are set out in an Ofcom-recommended paper 'A proposed method for establishing an exclusion zone around a terrestrial fixed radio link outside of which a wind turbine will cause negligible degradation of the radio link performance.'

Existing Baseline Conditions

- 4.2.311. A study area of 5 km radius from the site boundary will be adopted in order to determine the fixed telecommunications link baseline.
- 4.2.312. The telecommunications baseline will be determined from consultations and by review of Ofcom data. Initial indications suggest that there are no telecommunications links with the potential to be adversely affected by the Proposed Development. If this is the case after consultation the intention would be to scope this element out of the EIA.

Proposed Assessment Methodology and Consultation

- 4.2.313. The proximity of the Proposed Development to fixed telecommunications links will be assessed by interrogating the Ofcom Spectrum Information Portal and its associated Wireless Telegraphy Register; and by consulting the operators of scanning telemetry links.
- 4.2.314. Significance criteria for assessment of impacts on telecommunications, unlike those for environmental effects, are not based on the sensitivity of the receptor. Further, while magnitude of change can be determined in some circumstances, it typically does not provide a standardised metric on which to measure the significance of any effects. In this context, the significance of effects on telecommunications will be determined by application of professional judgement, underpinned by consideration of the magnitude of change (where measurable), the regulations and procedures in place for ensuring that telecommunications infrastructure meets required performance standards, the safeguarding policies, and practices in use by specific aviation stakeholders, and the consultation responses from those stakeholders.
- 4.2.315. It is proposed to use the criteria set out in **Table 4.14** to assess the significance of aviation effects.

Table 4.14: Significance of effect criteria

Significance	Criteria
Major	Regular, frequent, or permanent effects which require changes to existing operational and/or technical practice in order to mitigate adequately, or which are not capable of being mitigated adequately.
Moderate	Periodic effects experienced which may require alterations to existing operational practice.
Minor	Occasional effects experienced which do not require any alteration of existing operational and technical practice.
Negligible	Normally no measurable change from baseline conditions; occasional, fleeting or very short-term effects experienced which do not require any alteration of existing operational and technical practice.
Nil	No measurable change from baseline conditions.

Climate and Carbon Balance

Introduction

- 4.2.316. A key benefit of wind energy (in common with other renewable energy technologies) is the generation of low carbon electricity. This contrasts with much of the electricity distributed on the national grid generated by fossil fuels. Fossil fuel-generated electricity gives rise to the emission of carbon dioxide and other GHGs which trap heat within the atmosphere. This leads to the destabilisation of the prevailing climate (climate change).
- 4.2.317. Operating wind farms deliver GHG savings by offsetting the consumption of fossil fuel-generated electricity. However, the manufacture, construction and decommissioning of windfarms does result in GHG emissions, particularly where natural carbon stores such as peat are impacted.

References and Standard Guidance

- SNIFFER (2021) Evidence for the third UK Climate Change Risk Assessment (CCRA3). Available at: <https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA-Evidence-Report-Scotland-Summary-Final-1.pdf>
- Committee on Climate Change (2020) Reducing emissions in Scotland Progress Report to Parliament. Available at: <https://www.theccc.org.uk/publication/reducing-emissions-in-scotland-2020-progress-report-to-parliament/>
- Institute of Environmental Management and Assessment (2017) Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance.
- NatureScot (2016) Carbon and Peatland map. Available at: <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map>
- Nayak et al. (2010) Calculating Carbon Savings from Windfarms on Scottish Peatlands – a New Approach
- Nayak et al. (2008) Calculating Carbon Savings from Windfarms on Scottish Peatlands – a New Approach
- Scottish Environment Protection Agency. SEPA Flood Maps. Available at: <https://map.sepa.org.uk/floodmaps/FloodRisk/PostCode>. Crown Copyright. SEPA License Number 100016991 (2020). All Rights Reserved

Existing Baseline Conditions

- 4.2.318. The Scottish Government requires the nation-wide reduction of GHG emissions through the Climate Change (Scotland) Act 2009. When introduced, the Act set a target of reducing GHG emissions by at least 80% by 2050, relative to the 1990 baseline year. In October 2019, this was amended by the Climate Change (Emissions Reductions Target) (Scotland) Act 2019. The amendment set out to achieve net zero by 2045 in line with the recommendations of the Climate Change Committee. This long-term aim is one which is supported by WDC. Specifically, the LDP serves to ensure that *“renewable energy ... is achieved in line with national climate change targets whilst giving due consideration to environmental, community and cumulative impacts.”*
- 4.2.319. The application site is an area of greenfield land. The land comprises Class 1 peat soils and Class 2 peat soils with or areas with high potential to be restored to peatland. Class 3 peatland with heath lies along the southern and northern periphery of the site where forestry can also be found.
- 4.2.320. Given these baseline characteristics, it is likely that the application site presently sequesters carbon. If disturbed, these carbon stores have the potential to release carbon into the atmosphere to form carbon dioxide. It is thus possible that in addition to the GHG emissions associated with the manufacture, construction and decommissioning of the Proposed Development, on-site activities may also contribute towards limiting the sequestration capacity of the application site.
- 4.2.321. With that being said, this negative impact is likely to be offset by the significant positive impact from generation of zero carbon electricity by the Proposed Development during operation. Depending on the proposed design, its net impact therefore has the potential to be significantly positive.

Proposed Assessment Methodology and Consultation

- 4.2.322. A desk-based assessment will be undertaken, using the latest version of the Scottish Government's Carbon Calculator Tool (v1.6.1), to quantify GHG emissions and savings over the project lifecycle (manufacture, construction, operation, and decommissioning). The assessment will also estimate the Proposed Development's net GHG impact and 'carbon balance period' (the time following the start of wind farm operation at which the GHG emissions associated with manufacture, construction and decommissioning activities are offset through GHG savings from the wind farm's operation).
- 4.2.323. The assessment will draw on site-specific information including:
- site characteristics (e.g., average temperature, wind speed);
 - peat type and depth (from peat survey);
 - water table depth before and after construction and decommissioning;
 - development proposals (turbine number and output, access tracks, borrow pits, hard standing and foundation areas etc.); and
 - post-decommissioning replanting, restoration and draining proposals.
- 4.2.324. During the design process, the wind turbines will be sited to avoid the areas of deepest peat as far as practicable, and measures to minimise peat disturbance, especially during excavation, will be considered. To minimise peat disturbance in construction and decommissioning best practice measures will be provided as part of the Construction Environmental Management Plan.
- 4.2.325. No consultation has taken place to date. Consultation will take place with statutory and non-statutory consultees who will receive this scoping document and whose subsequent comments will be considered in the development of the climate change chapter of the EIAR.

Shadow Flicker

Introduction

- 4.2.326. This section considers shadow flicker, an effect caused in particular circumstances by the rotation of the turbine blades when the sun is shining, which can create a flickering or strobe-like effect. This can be a cause of annoyance at residences near wind developments.

Guidance

- 4.2.327. There are no formal guidelines currently available on what exposure would be acceptable in relation to shadow flicker. There is no standard for the assessment of shadow flicker. The Scottish Government's web-based guide relating to onshore wind turbines (Scottish Government 2013) suggests that shadow flicker should not cause nuisance and annoyance to dwellings beyond a distance of 10 rotor diameters from a wind turbine, which equates to up to 1620 m in this instance.
- 4.2.328. Department of Environment and Climate Change (DECC) studies have shown that in northern latitudes shadows from wind turbines can only be cast 130 degrees either side of north relative to the turbine due to the orientation of the earth's axis and the positioning of the sun. This equates to a region of 50 degrees either side of due south where a wind

turbine will never cast a shadow and therefore properties within this region will experience no effects from shadow flicker.

Proposed Assessment Methodology and Consultation

- 4.2.329. The Proposed Development will be designed where possible to avoid turbine placements within the Zone of Potential Shadow Flicker (ZPSF). Should this be achieved, shadow flicker will be scoped out of the EIA. If it is not possible to avoid shadow flicker effects through turbine placement, then the dates, times, and durations of shadow flicker events for each property within the ZPSF will be calculated and an assessment of effects at these properties included in the EIAR.

Socio-economic, Land-use, Tourism and Recreation

Introduction

- 4.2.330. This chapter will consider the potential socio-economic, land use, tourism, and recreation effects from the Proposed Development. This includes consideration of existing land uses within the site, employment generation and other economic effects, and local recreation and tourism activity.

Guidance

- 4.2.331. There is no specific legislation or guidance available on the methods that should be used to assess the socio-economic impacts of a proposed onshore wind farm development. The proposed method has however been based on established best practice, including the used in UK Government and industry reports on the sector. In particular this assessment will draw from two studies by BiGGAR Economics on the UK onshore wind energy sector, a report published by RenewableUK and the DECC in 2012 on the direct and wider economic benefits of the onshore wind sector to the UK economy (RenewableUK/DECC, 2012) and a subsequent update to this report published by RenewableUK in 2015 (RenewableUK, 2015).
- 4.2.332. There is also no formal legislation or guidance on the methods that should be used to assess the effects that wind farm developments may have on general tourism and recreation interests. The proposed method will consider individual attractions and tourism facilities to assess if there could be any effects from the development.
- 4.2.333. For recreational assets, guidance has been provided by NatureScot on how to assess effects on recreational amenity and the approach outlined has been used (Scottish Natural Heritage, 2014).. This takes into consideration a number of potential effects, including direct effect on facilities, such as limitation or restrictions on access, and effects on the intrinsic quality of the resources enjoyed by people. In general, this guidance would consider recreational and access impacts to potentially be significant if:
- permanent or long-term effects on the resources on which enjoyment of the natural heritage depends, in particular where facilities have been provided by SNH or others under statutory powers;
 - permanent or long-term change that would affect the integrity and long-term sustainable management of facilities which were provided by SNH or others under statutory powers;

- where there are recreational resources for open air recreation pursuits affected by the proposal which have more than local use or importance, especially if that importance is of national significance;
- major constraints on or improvements for access or accessibility to designated natural heritage sites; and
- where mitigation and/or compensatory or alternative recreational provision is considered to be inadequate.

Existing Baseline Conditions

- 4.2.334. The baseline description will cover and compare the study areas of:
- West Dunbartonshire;
 - Scotland; and
 - the UK.
- 4.2.335. The Proposed Development is located in West Dunbartonshire, east of the settlement of Bonhill.
- 4.2.336. The site is currently upland moorland and predominantly used for sheep grazing.
- 4.2.337. The population of West Dunbartonshire was 88,300 in 2020 (1.6% of the Scottish total), of which 63.4% were working age, marginally lower than the figure for Scotland of 63.9% (National Records of Scotland, 2021). Between 2018 and 2043, the population is projected to decrease by 7.4%, compared to a 2.5% increase for Scotland as a whole (National Records of Scotland, 2020).
- 4.2.338. The proportion of the population that is economically active is lower in West Dunbartonshire (74.2%), compared to Scotland as a whole (76.1%), while the unemployment rate is 5.6%, compared to 4.3% nationally (Office for National Statistics, 2021).
- 4.2.339. The main sectors of employment are human, health and social work activities (20.1% of employment in West Dunbartonshire compared to 16.1% in Scotland), wholesale and retail trade (13.9%, compared to 13.7% nationally) and public administration and defence (11.6%, compared to 6.2% nationally). This suggests that a large share of employment is in the public sector.
- 4.2.340. The share of employment in construction in West Dunbartonshire is 3.5%, compared to 5.1% across Scotland as a whole.
- 4.2.341. In 2019, there were 1.8 million day visitors in West Dunbartonshire (compared to 144.9 million in Scotland as a whole) and 70,000 domestic overnight visitors (compared to 12.4 million nationally). Domestic visitor spend was £64 million, 0.8% of the £8.2 billion in Scotland as a whole (Kantar TNS, 2020) (Kantar TNS, 2020).
- 4.2.342. The socio-economic and strategic baseline shall be expanded on in the chapter through a review of publicly available data sources. This will include:
- the population characteristics of the local area, including local and national demographic trends;
 - deprivation statistics set within a national context;
 - employment and economic activity in the local area within the context of the national economy;
 - wage levels in the local area compared to the national level;

- the industrial structure of the local economy compared to the national level; and
- the role of the tourism sector in the local economy, with consideration of assets, including accommodation providers and recreational trails, within 15 km of the Proposed Development.

4.2.343. In addition, the desk study will take account of relevant local and national policy objectives. The most relevant are expected to include:

- Scottish Government (2022), Scotland's National Strategy for Economic Transformation;
- Scottish Government (2018), Scotland's National Performance Framework;
- Glasgow City Region (2021), Glasgow City Region Economic Strategy;
- WDC's local economic strategy;
- Scottish Tourism Alliance (2021), Scotland Outlook 2030; and
- Loch Lomond & The Trossachs National Park (2017), National Park Partnership Plan 2018-2023.

Proposed Assessment Methodology and Consultation

4.2.344. Criteria for determining the significance of effects will be based on the sensitivity of an economy or tourism and recreation asset, as well as the magnitude of impacts. This will include effects during the construction and operation phases.

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

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

4.2.347. The method to assess the socio-economic effects will be based on industry best practice and will consider the share of contracts that can be secured in each study area, and the level of employment that can be supported as a result. BIGGAR Economics has significant experience working on onshore wind farm projects across Scotland and has previously analysed construction and operational spend of existing projects on the local supply chain. This work involved consulting with local tourism businesses and groups to gain an understanding of the impact the developments had on their business and customers.

4.2.348. This will also consider the potential impacts of any energy storage systems that are co-located on the site.

4.2.349. The economic impacts will be quantified for West Dunbartonshire, Scotland, and the UK.

4.2.350. The impacts on tourism and recreation assets will be assessed up to 15 km from the Proposed Development, with a focus on whether visitor behaviour is likely to change. This will include potential effects on visitor attractions and accommodation providers, in particular key features that make them attractive. The focus of the assessment will be the potential impact that the Proposed Development could have on key drivers of tourism activity in the area, such as the LLTNP. It will also consider the assets, or clusters of

assets, in areas that have been identified as having significant effects in other chapters, including Traffic and Transport, Noise and Landscape and Visual Impact.

- 4.2.351. The assessment will be informed by the most up-to-date evidence on the relationship between tourism and onshore wind development.
- 4.2.352. Effects on recreational trails such as the West Highland Way will also be considered with a focus on whether the Proposed Development will affect access or reduce recreational amenity.
- 4.2.353. Consultee responses to scoping, including from community councils, LLTNP and WDC, will be considered and issues related to socio-economics, land use, tourism and recreation will be addressed.
- 4.2.354. An assessment of the cumulative socio-economic, land use and tourism effects will be provided.
- 4.2.355. Initiatives such as community benefit funding and community ownership do not form part of the formal appraisal process within the planning system. However, these shall also be considered within the chapter to present a fuller picture of the economic and social impacts that the Proposed Development could have.

Questions for Consultees

- Are the scopes of the proposed assessments appropriate?
- Are Consultees aware of any key sensitive receptors that should be considered?
- Are Consultees aware of any additional relevant consultees?
- Do consultees agree with the proposed design mitigation approach to avoid potential shadow flicker effects?
- Do consultees agree with the proposed assessment methodology for calculating carbon balance?
- Please confirm additional requirements, which have not been covered, that you believe should be included in this element of the EIA.

4.3. Environmental Aspects Scoped Out

Air Quality

- 4.3.1. This section considers the scope of the required assessment of impacts that the Proposed Development might have on air quality.
- 4.3.2. The main source of impact on air quality would be increased traffic flows on local roads during construction and emissions from construction activities including exhaust fumes and dust generated from quarrying activities associated with borrow pits and unmade ground from borrow pits and access tracks in dry conditions.
- 4.3.3. It is considered that the emissions associated with these activities would be transient, localised and highly unlikely to have a significant effect upon local air quality. In addition, there are well established best practice measures applied to construction that will form an integral part of the development process (e.g., speed control, optimising deliveries to site, dust control, restrictions on idling plant/vehicles, etc). These controls and measures will form an integral part of the Construction Environmental Management Plan (CEMP) for the Proposed Development and will be detailed within the relevant parts of the EIAR.

- 4.3.4. There would be negligible emissions to air during operation, with the only source being occasional vehicles accessing the site for maintenance purposes. For the reasons cited above Air Quality is therefore proposed scoped out from further assessment.

Population and Human Health

- 4.3.5. As per the 2017 EIA Regulations (as amended), an assessment of population and human health should be considered during the EIA process. It is proposed that this requirement will be covered through the findings of other assessments undertaken as part of the EIA process and so no dedicated EIA chapter will be produced.
- 4.3.6. Limited interactions with human health are possible, and consideration will be given to the findings of the following assessments in the EIAR:
- Noise;
 - Residential Amenity;
 - Traffic and Transportation; and
 - Telecommunications;
 - Aviation and Radar;
- 4.3.7. Properly designed and maintained wind turbines are a safe technology. The site design and in-built buffers from sensitive receptors will minimise any risk to human health resulting from the operation of the turbines.
- 4.3.8. As risks associated with ice build-up and lightning strike are removed or reduced through in-built turbine mechanisms in modern machines it is proposed that this can be scoped out of the EIA.
- 4.3.9. Effects on Traffic and Transportation, Noise and Residential Amenity will be assessed in full elsewhere within the EIAR.
- 4.3.10. Consideration of the risk of transmission or spread of Covid-19 will be necessary within the project description section of the EIAR. The applicant commits to working in accordance with the relevant UK and Scottish Government advice and regulations on minimising the spread of Covid-19 applicable at the time of construction of the Proposed Development.
- 4.3.11. All other potential interactions with Human Health, building in Health and Safety best practice, and an appropriate approach to layout design, resulting from ice, lightning strike and structural failures are unlikely to occur and as a result potentially significant effects are not anticipated.

Vulnerability of the Development to Risks of Major Accidents and/or Disasters (Including Climate Change)

- 4.3.12. None of the following climate trends identified in UKCP09 could affect the Proposed Development with the exception of increased windstorms:
- Increased temperature;
 - Wildfire;
 - Changes in the frequency, intensity, and distribution of rainfall events (e.g., an increase in the contribution to winter rainfall from heavy precipitation events and decreases in summer rainfall);
 - Increased windstorms; and

- Sea level rise.

4.3.13. Braking 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. In addition, given the elevated location of the site, flooding will not pose a significant risk to the operation of the wind farm nor will the construction of the Proposed Development contribute to flooding elsewhere. Therefore, it is considered unlikely that significant effects will arise as a result of the Proposed Development, and this topic is proposed to be scoped out of the EIA.

Questions for Consultees

- Do consultees agree that air quality can be scoped out of the EIA?
- Do consultees agree that population and human health can be scoped out of the EIA?
- Do the consultees agree that vulnerability of the development to risks of major accidents and/or disasters (including climate change) can be scoped out of the EIA?

5. CONSULTATION & NEXT STEPS

5.1. Public Consultation

- 5.1.1. In accordance with established good practice, the applicant is currently planning to host a series of public consultation events, and the establishment of a dedicated project website with associated comments forms. Standard practice would be to host these public consultation events in a public space to exhibit the display boards and for members of the project team to answer questions from the public. This is the preferred approach of the applicant. However, in light of the possibility of further restrictions on public meetings coming from UK Government advice as a result of COVID-19, both the applicant and RSK are considering contingency approaches for delivering inclusive and effective public consultation events if necessary.
- 5.1.2. The alternative approaches will be based on remote and/or virtual methods of consultation so the public can participate from the safety of their own homes. It is key that the consultation methods adopted allow for proper engagement with local communities. The applicant respects that not all members of the public will have access to the same level of technology so it is likely that a multi-faceted approach will be taken to ensure consultation is fully inclusive.
- 5.1.3. Written public comments received in response to each of these methods will be documented and analysed, with any adjustments incorporated to the project design noted in the EIAR and SoCC.

5.2. Consultation Bodies and Non-Statutory Consultees

- 5.2.1. As part of this scoping process the applicant is inviting inputs from the consultation bodies and non-statutory consultees to inform the Proposed Development.
- 5.2.2. In addition to the receipt of this Scoping Report, consultees identified in **Appendix 1** will receive a separate formal consultation email from the Scottish Government's Energy Consents Unit. Responses to this should be sent to econsentsadmin@gov.scot by the deadline specified in the email

5.3. Next Steps

- 5.3.1. This Scoping Report is provided to ECU in support of a request by Coriolis Energy for a 'Scoping Opinion' regarding the information to be provided within the EIAR which will be submitted to the ECU.
- 5.3.2. In forming its opinion, the ECU will seek the views of various organisations with an interest in the Proposed Development (including WDC), inviting comments on the proposed scope and approach to the EIA proposed herein.
- 5.3.3. In submitting your comments to the ECU on this Scoping Report, Coriolis Energy would be grateful if you could send copied responses to:

Robert Beck
EIA Project Manager
RSK Environment Ltd
65 Sussex Street
Glasgow
G41 1DX
Email: rbeck@rsk.co.uk

6. APPENDIX 1 LIST OF CONSULTEES

List of Consultation Bodies

- West Dunbartonshire Council (WDC) as Planning Authority:
 - Environmental Health Officer
 - Flood Protection Officer
 - West of Scotland Archaeology Service (archaeology and cultural heritage advisers for WDC)
 - Roads Planning Service
 - Access Officer
 - Landscape Architect
 - Ecology Officer
 - Planning Officer
- Scottish Environment Protection Agency (SEPA)
- NatureScot
- Historic Environment Scotland (HES)
- Internal Scottish Government Advisors (Transport Scotland, Marine Scotland, Scottish Forestry)

List of Non-Statutory Consultees*	
Scottish Water	British Horse Society Scotland
Scottish Wildlife Trust (SWT)	VisitScotland
Loch Lomond and Trossochs National Park	Stirling Council
Airwave	Prestwick Airport
Scottish Forestry	Transport Scotland
Royal Society for the Protection of Birds (RSPB)	BAA Aerodrome Safeguarding (Glasgow)
Joint Radio Company (JRC)	Scottish Rights of Way and Access Society (ScotWays)
BT	Civil Aviation Authority
Fisheries Management Scotland	Defence Infrastructure Organisation

List of Non-Statutory Consultees*	
Mountaineering Scotland	John Muir Trust
Nuclear Safety Directorate (HSE)	Scottish Wild Land Group
NATS Safeguarding	Bonhill and Dalmonach Community Council
Kilmarnock Community Council	Balloch and Haldane Community Council
Silverton and Overtoun Community Council	Milton and Bowling Community Council

* Renton Community Council and Dumbarton North Community Council are currently inactive so are not included amongst consultees. They will be consulted during the EIA process, should they reform during the course of the project.

7. APPENDIX 2 FIGURES

Figure no.	Figure Title
2.1	Site Location
2.2	Scoping Turbine Layout
4.2.2ai	Landscape Character (20 km radius)
4.2.2aii	Landscape Character Key
4.2.2b	Landscape Designations and Wild Land (20 km radius)
4.2.2c	Principal Visual Receptors (20 km radius)
4.2.2d	Blade Tip (200 m) Zone of Theoretical Visibility and Draft Viewpoints (45 km radius)
4.2.3a	Known heritage assets within the Inner Study Area (ISA)
4.2.3b	Designated heritage assets in the Outer Study Area (OSA)
4.2.4a	Ecological Designated Sites, Ancient Woodland and Peatland within 5 km
4.2.4b	Ecological Survey Area
4.2.5a	Ornithological Designated Sites Within 20 km
4.2.5b	Ornithological Survey Area