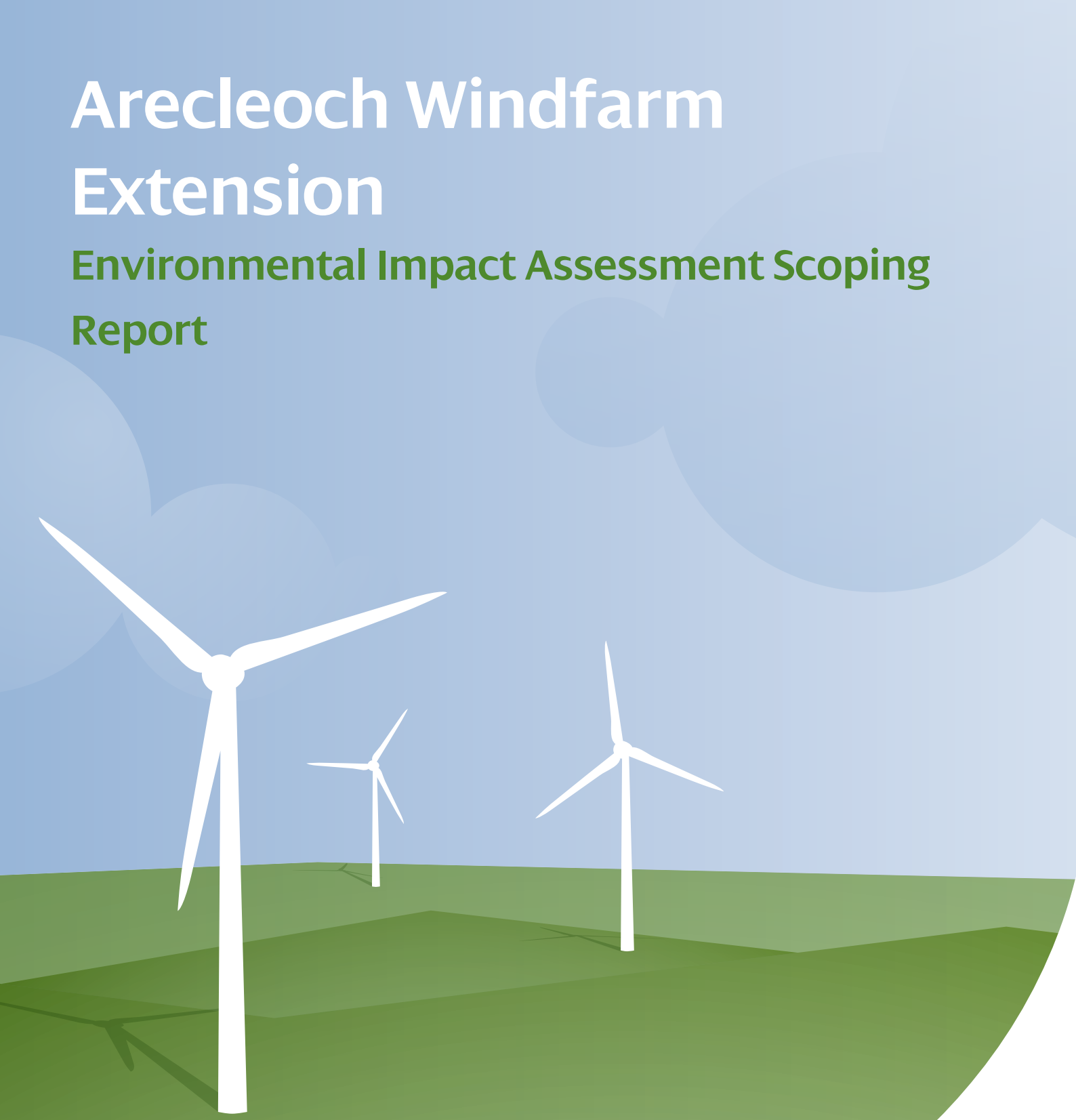
Arecleoch Windfarm Extension

Environmental Impact Assessment Scoping Report



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1. INTRODUCTION

Overview

ScottishPower Renewables (SPR) intends to apply to the Scottish Government Energy and Consents Unit (ECU) for planning permission to develop a windfarm approximately 2km south west of Barrhill in South Ayrshire (the Site). The location of the Site is shown in Figure 1.1.

The majority of the Site is located within South Ayrshire Council (SAC). The entrance to the Site is within the Dumfries and Galloway Council (D&GC) area.

It is anticipated that the proposed Development would comprise around 15 wind turbines with associated infrastructure including external transformers, crane hardstandings, access tracks, cabling, borrow pits and a single substation including control building and ancillary services equipment/battery storage. It is proposed that the turbines would have an installed capacity of in the region of 5MW. An indicative layout for the proposed turbines is shown in Figure 1.2, at the current time the layout of the proposed infrastructure is not known, however it is expected that the site would have a generating capacity up to 75MW.

The proposed Development is an extension to the existing Arecleoch Windfarm which has been operational since 2011 and a capacity of 120MW. Given the proposed Development is an extension to a windfarm which was granted planning consent under Section 36 of the Electricity Act 1989 (the 1989 Act), it is the intention of SPR to submit an application for planning permission under Section 36 the 1989 Act. The proposed Development will constitute a Schedule 2 development as provided for by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (the EIA Regulations 2017).

SPR has a long standing interest in south west Scotland and currently owns and operates five onshore windfarms in the South Ayrshire region (Arecleoch, Mark Hill, Kilgallioch, Dersalloch and Glen App) and a number of others in the wider Ayrshire and Dumfries and Galloway regions. Through SPR's established presence in South Ayrshire, the Applicant has to-date, contributed over £5.2m of community benefits (and over £9m including Dumfries and Galloway), contributing to a variety of groups and organisations. It is expected that the proposed Development would establish a community benefit arrangement with local communities and there will an option for community investment.

SPR recognises the importance of the economic benefits to Scotland and the rest of the UK from investing in onshore wind generation. SPR recently constructed 8 onshore windfarms in south west Scotland between 2016-17 with a combined capacity of 474MW. It is estimated that this £1.6 billion investment would have 51% Scottish expenditure content over the lifetime of the projects, provide 31,118 UK Full Time Equivalent (FTE) job years, including 7,768 local FTE years (within SW Scotland), provide £297 million local value-added and £59 million in community benefit funding. It is expected that the proposed Development would further enhance the economic opportunities within the region and would contribute significant local income through business rates[1].

SPR has appointed SLR Consulting Limited (SLR) with input from MacArthur Green (Peat, Ecology, Geology), Natural Research (Projects) (Ornithology), DGA Forestry (Forestry) and Hoare Lea Acoustics (Noise) to undertake an EIA scoping study and prepare this Scoping Report to accompany a request to the ECU to adopt a Scoping Opinion.

The EIA Scoping Opinion, consultation responses and the findings of the EIA process will be used to inform the final design of the proposed Development and assess its predicted environmental effects. The

[1] BVG Associates (2017) Economic benefits from onshore wind farms: A report for ScottishPower Renewables

results of the EIA will be presented in an Environmental Impact Assessment Report (EIA Report) that will be submitted with the application for consent to develop a windfarm to the ECU.

Purpose of the Scoping Report

Undertaking an EIA scoping study is regarded as good practice[2] and is considered to be an important step in EIA as it allows all parties involved in the process to agree on key environmental issues relevant to the proposed Development and to agree on the methodology used for their assessment. The Scoping stage helps to engage the planning authority and other stakeholders, in this case the ECU, at an early stage in the planning process; and ensures that key opinions, based on local understanding, are identified.
The specific aims of this Scoping Report are to:

- engage with the ECU, SAC and other statutory consultees and stakeholders at an early stage in the EIA process, thus ensuring that these parties are informed about the project;
- provide all statutory consultees and stakeholders as listed in Appendix A with an opportunity to comment on the proposed Development at an early stage;
- identify all environmental and technical issues that are likely to be significantly affected by the proposed Development, for consideration as part of the EIA;
- agree the size of the geographical area that will be assessed in the EIA, for each environmental and technical discipline;
- agree the methodology of assessment for each environmental and technical discipline included within the EIA;
- minimise the environmental impacts and effects of the proposed Development; and
- 'scope out' those issues where significant effects are unlikely.

Upon receipt of the Scoping Opinion, SPR will continue the EIA process that will lead to the preparation of an EIA Report, paying due cognisance to the findings and responses received. In the 2017 version of the Environmental Impact Assessment (EIA) Directive (2014/52/EU), scoping remains voluntary, however, if a Scoping Opinion is requested, there is a requirement to base the EIA on the Scoping Opinion received.

The Applicant

The applicant will be ScottishPower Renewables (UK) Limited (SPR).

ScottishPower Renewables is part of the Iberdrola Group, a world leader in clean energy with an installed capacity of over 29,000 MW, and the leading wind energy producer worldwide.

ScottishPower Renewables is helping to drive the Iberdrola Group's ambition of being the Utility of the Future and is at the forefront of the development of the renewables industry through pioneering ideas, forward thinking and outstanding innovation which, in turn, drives economic success. Our ambitious growth plans include offshore windfarms in East Anglia with our team leading the Group's international offshore development.

With over 40 operational windfarms, we manage all of our sites through our innovative and world leading Control Centre at Whitelee Windfarm.

[2] SNH (2018) A Handbook on Environmental Impact Assessment 5th Edition

SLR Consulting Limited

SLR is a Registered Environmental Impact Assessor and Member of the Institute of Environmental Management and Assessment (IEMA) and holder of the EIA Quality Mark (http://www.iema.net/qmark). SLR is also a Registered Organisation validated by the Institute for Archaeologists (IfA), a member of the Association of Geotechnical and Geoenvironmental Specialists, and a Landscape Institute (LI) Registered Practice.

The company has significant experience and expertise in the preparation of planning applications and undertaking EIA for a wide variety of projects. SLR's environmental specialists, have the skills and relevant competency, expertise and qualifications to undertake EIA for the proposed Development.

Further information on SLR can be found on its corporate web Site at www.slrconsulting.com.

Project Team

SLR has been commissioned by SPR to undertake the EIA for the proposed Development, with input from specialist consultants MacArthur Green (Peat, Ecology, Geology), Natural Research (Ornithology), DGA Forestry (Forestry) and Hoare Lea Acoustics (Noise).

Report Structure

Following this introductory section, the remainder of this report comprises the following Sections:

- Section 2.0: Site and Surroundings:
    - Describes the location, setting and physical characteristics of the Site and describes baseline features in and around the Site.
- Section 3.0: Windfarm Proposal:
    - Provides an outline and rationale of the proposed Development.
- Section 4.0: Environmental Impact Assessment:
    - Provides detail on the approach to scoping the EIA, sets out the process of scoping consultation and describes the specialist studies that will be undertaken to assess the impact of the proposed Development on the environment, and a reasoning why certain aspects have been scoped out of the EIA.
- Section 5.0: Planning Policy Context:
    - Identifies the development plan and provides a list of policy and guidance to be considered.
- Section 6.0 - 16.0: Specialist Environmental Studies that are Proposed to be Undertaken:
    - Describes the specialist environmental studies that are proposed to be undertaken to assess the potential impact of the proposed Development on the environment and, where relevant, notes those aspects to be scoped out of assessment.
- Section 17.0: Other Environmental Topics:
    - Describes the environmental topics which are considered not likely to experience significant effects and are therefore proposed to be scoped out of the EIA, or signposts

readers to where relevant effects are considered within other technical chapters of the EIA Report.

- Section 18.0: Invitation to Comment:
    - Provides contact details for SLR, with whom any matters contained within this report may be discussed in greater detail prior to responding to the scoping exercise.

For the purpose of this Scoping Report, the Site refers to the area within the redline. Where the area of the proposed turbines is referred to it is described as the indicative turbine developable area and where only the access track is being referred to it is described as the proposed site access. The proposed turbine area is shown on Figure 1.3. The area which is shown around the existing Arecleoch turbines has been included in order that the borrow pits which were considered as part of Arecleoch can be revisited and if suitable included as part of the proposed Development. For the avoidance of doubt, there is no intention to locate new turbines within the Arecleoch turbines or to vary the permission for Arecleoch Windfarm.

2. SITE AND SURROUNDINGS

Site Location and Topography

The Site, centred on grid reference 219400, 580900, is located approximately 2km south west of the settlement of Barrhill. The majority of the Site is within the SAC administrative boundary, however the Site entrance is within the D&GC area. The Site is approximately 4275. ha, and is currently used for commercial forestry purposes. Access to the Site for turbine deliveries would be via the existing entrance at Wheeb Bridge on the A714. The Site is characterised by a Plateau Moorland landscape covered mainly by commercial forest and encompasses the western side of Shiel hill (228.4m AOD). A number of small tributaries run through the Site and feed the Water of Tig, Cross Water and Haw Burn. These three water courses then in turn feed into the River Stinchar.

Surrounding Area

The surrounding area is rural in nature, with land predominantly used for commercial forestry purposes and agriculture. The nearest settlement to the Site is Barrhill which is located 2km north west of the Site. Other nearby settlements include Pinwherry and Colmonell which are to the north of the Site at a distance of approximately 3.3km and 3.5km respectively.

To the west of the Site is an expanse of higher ground including several hills such as Kilmoray (421m AOD), Strawarren Fell (323m AOD) and Loch hill (270.1m AOD). To the north and east of the Site the area is characterised by valley landscapes.

Immediately to the west of the Site is the operational Arecleoch Windfarm comprising of 60 turbines which extend in a north to south direction in an arc shape, across the side slopes of the Beneraird and Kilmoray hills and the summit of Strawarren Fell. The Arecleoch Windfarm turbines were consented at 135m to tip however the turbines that were constructed are 118m to tip.

Kilgallioch Windfarm which comprises of 96 turbines (max 146.50m tip height) is located to the south of the Site. To the south west of the Site is Chirmorie Wind Farm which has been consented and to the east of the Site is, Altercannoch Wind Farm which is currently the subject of an appeal against the decision of SAC to refuse planning permission for the development of 8 turbines with a tip height of 131m.

Designated Sites

Designations in and around the Site are shown on Figures 2.1 and 2.2. The landscape designation closest to the Site is the South Ayrshire Scenic Area, located to the north and east of the Site. Glenapp, is a designated Garden and Designated Landscape and is located 5km to the west of the Site, this is the closest such designation to the Site. There are no Listed Buildings or Scheduled Monuments within the site.

3. WINDFARM PROPOSAL

Proposed Development

The proposed turbine area is approximately 892ha in size. It is currently anticipated that the proposed Development would consist around 15 wind turbines with blade tip heights of up to 200m (see Figure 1.2). The related infrastructure proposed would likely include the following components:

- external transformers at the base of each turbine;
- crane hardstandings adjacent to each turbine;
- power cables linking the turbines laid in trenches underground, including cable markers;
- upgraded and new Site access tracks, passing places and turning circles;
- permanent and temporary power performance assessment (PPA) anemometry masts;
- substation compound including a control building, parking, lighting columns and battery storage / ancillary grid services equipment, with solar panels on the roofs of buildings;
- communication mast(s);
- Health and Safety and other directional signage;
- close circuit television (CCTV) mast(s);
- radar sensor mast;
- temporary Site construction compounds; and
- temporary borrow pits.

The proposed Development is expected to contribute up to 75MW to the Scottish Government's renewable energy targets and would be decided under Section 36 of 'The Electricity Act 1989'.

The proposed Development will seek to maximize the reuse of infrastructure as far as possible and the existing crossing of the Girvan to Stranraer railway line would be utilized.

The substation would be located next to the existing Arecleoch substation and the grid connection may be undergrounded to the Kilgallioch Windfarm substation. Any permits or licences required for the grid connection will be undertaken as a separate exercise with National Grid and ScottishPower Energy Networks as required.

Turbines

A candidate turbine manufacturer and model will be selected for each technical and environmental discipline for the purposes of the EIA. A competitive procurement process will be undertaken, should consent be forthcoming and prior to construction, to select the final turbine that would be installed on Site. The final wind turbine selected would have a tip height of up to 200m.

The specification of the wind turbine would be a typical horizontal axis design, comprising of three rotor blades, a hub and a nacelle. The tower would be tubular and tapered in design and finished in a light grey semi-matt colour.

An indicative layout of 15 turbines is shown on Figure 1.2. Each wind turbine would be served by its own external, electrical transformer, assumed to be external in order to assess the worse case scenario. The transformers would be located close to the base of each wind turbine.

Substation

The proposed Development would include a new on Site substation and control building, likely to the north west of the Site, located adjacent to the existing Arecleoch Windfarm substation. The substation and control building is anticipated to be a single storey building with a pitched roof and solar panels. The building would also house switchgear, metering, protection and control equipment.

Battery Storage / Ancillary Services

The proposed Development would include battery storage and ancillary service equipment within the substation compound. The batteries would store power generated by the proposed Development and release the power on to the grid as agreed with National Grid.

Access

It is proposed that the wind turbines would be delivered to the port of Cairnryan or George V Dock in Glasgow. The turbines would be moved from the port of entry to the site under escort. In the case of Cairnryan turbines would be moved south along the A77, A751, A75 and then the unclassified road past Newton Stewart and then north along the A714 to the site entrance at Wheeb Bridge. In the case of George V Dock the turbines would be moved along the A74 (M) to the M6 where they would be turned northwards at junction 44, along the A75 to the unclassified road past Newton Stewart where they would join the A714. This route has previously been used during the construction of Arecleoch and Kilgallioch Windfarms.

HGV construction vehicles would mainly use the access from Wheeb Bridge, however it is anticipated that the site entrance at Bents Farm may be used for some construction traffic and also used for Light Goods Vehicle (LGV) during operation. It is also proposed that the unclassified Barrhill to New Luce road may be used for some LGV traffic during construction and operation. New access tracks would be required within the Site and existing access tracks may require upgrading.

Borrow Pits

Material for the construction of on-site access tracks would, where possible, be won on site either derived from existing borrow pits, as tracks are constructed or from new borrow pits. This approach would minimise transportation movements of stone to site. The location and design of borrow pits will be defined as part of the EIA process and site design.

Forestry

Much of the Site is covered in commercial forestry, some of which are presently being felled ready for replanting. Forestry will form an integral part of the proposed Development and a detailed forest design and management plan will be submitted with the application. The forest works will be subject to assessment through the integrated EIA process.

In the UK there is a strong presumption against permanent felling unless it addresses other environmental concerns such as Phase 1 habitat restoration (e.g. peatland). In Scotland such felling is dealt with under the Scottish Government's "Control of Woodland Removal Policy".[3] The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. The requirements of the Policy will be addressed within the forestry section of the EIA Report whilst ensuring that the forestry proposals do not compromise the wind flow and yield of the proposed Development. The integration of the proposed Development into Forest Enterprise Scotland's (as landowner) Land Management Plan will be a key part of the development process.

The main forestry consultee is Forestry Commission Scotland (FCS) 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.

Construction Works

The duration of the construction works is expected to be approximately 16 months.

Windfarm Lifecycle and Decommissioning

There is no proposal to limit the lifetime of the proposed Development. Therefore, the assessment of all technical areas considers the effects of the operational phase of the proposed Development, without time limitations. Should decommissioning of any of the proposed Development be required e.g. failure of a wind turbine beyond economic repair, it is considered that any effects would be less than those resulting from construction of the proposed Development, and as such this potential for decommissioning has been scoped out of further assessment. Should consent be granted, it is anticipated that there would be a condition which would deal with the requirement to remove turbines if they become non-operational for a defined period of time.

[3] The Scottish Government's Policy on Control of Woodland Removal. Forestry Commission Scotland, Edinburgh, Forestry Commission Scotland (2009).

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4. ENVIRONMENTAL IMPACT ASSESSMENT

Introduction

The EIA will be undertaken in accordance with the EIA Regulations, Circular 01/2017 (Scottish Government, 2017), the best practice guidelines of the Institute of Environmental Management and Assessment (Guidelines for Environmental Impact Assessment) published in 2004 and the Scottish Natural Heritage (SNH) handbook on EIA 2013.

The principal purpose of the EIA will be to assess in a systematic manner the likely significant environmental effects of the proposed Development.

Throughout the process of undertaking the EIA, the results obtained will be used in an iterative manner to influence the design of the proposed Development, in order that any significant, detrimental environmental effects can be minimised or negated completely through the careful design of mitigation measures or imbedded mitigation.

Potential Environmental Effects

The EIA Regulations (Regulation 4 (2), (3) and (4)) specify that the EIA must:

> *"(2) identify, describe and assess in an appropriate manner, in light of the circumstances relating to the proposed development, the direct and indirect significant effects of the proposed development (including, where the proposed development will have operational effects, such operational effects) on the factors specified in paragraph (3) and the interaction between those factors.*
>
> *(3) The factors are —*
> *(a) population and human health;*
> *(b) biodiversity, and in particular species and habitats protected under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora(a) and Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds;*
> *(c) land, soil, water, air and climate; and*
> *(d) material assets, cultural heritage and the landscape.*
>
> *(4) The effects to be identified, described and assessed under paragraph (2) include the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and disasters."*

Previous experience of other windfarm developments, combined with the EIA requirements, the knowledge of the Site and possible effects of the proposed Development, has led to the identification of the following topics for consideration in the EIA. A summary of known baseline conditions of relevance, predicted effects, any outline mitigation measures that can be recommended at this stage and the proposed scope for the EIA is provided for each of these topic areas in Sections 6 to 15. These are:

- Landscape and Visual;
- Ecology (Including Biodiversity);
- Ornithology;
- Noise;

- Archaeology and Cultural Heritage;
- Access, Traffic and Transport;
- Hydrology, Hydrogeology, Geology and Soils;
- Land Use, Socio Economics and Tourism;
- Other Issues; and
- Summary and Mitigation Schedule.

For each topic that is identified as requiring further study, a detailed technical assessment will be carried out in accordance with the scope and methodology agreed with relevant consultees. Each technical assessment will be carried out by an appropriately qualified consultant to prevailing technical standards and reported in a dedicated EIA Report chapter.

The technical assessments will each provide a detailed assessment of potential impacts, identification of mitigation measures and description of the significance of residual effects (those remaining after the mitigation measures have been implemented).

The EIA will identify direct and indirect effects, positive (beneficial) and negative (adverse) effects, and seek to identify, as far as possible, the duration of such effects, whether short term, long term, permanent, temporary, periodic, etc. during the construction and operational phases of the proposed Development. The results of each technical assessment will be reported in the EIA Report and will be accompanied by technical appendices and illustrative material where reasonable. A Non-Technical Summary (NTS) will also be produced.

Consultation

Pre-Scoping Consultation

SPR and SLR Consulting attended a pre-scoping advice meeting with the Scottish Government Energy Consents Unit (ECU) on 14th August 2018 to discuss the proposed Development and anticipated application submission.

Scoping Consultation

This Scoping Report is issued to the ECU, who will then consult with key consultees and stakeholders before forming their Scoping Opinion. It is anticipated that the agencies and bodies to be consulted will include those listed in Appendix A; this list is not exhaustive and other agencies will be consulted during the EIA as and when required.

The purpose of the consultation is to identify:

- key local issues and concerns;
- issues of environmental importance that may be affected by the proposed Development and need to be considered in an EIA;
- existing information that will be of assistance in the assessment of the environmental effects; and
- the need for further consultation.

Public Consultation

Public information events are planned for November 2018. This will be an opportunity for the public to learn about the proposed Development through information panels and visualisations. Discussion and feedback on the scheme will be encouraged; and where received, feedback will be taken into account in development of the design as part of the EIA.

The public exhibition will also be a chance for discussion on community involvement in the proposed Development through shared ownership and how the community might benefit from the proposed Development.

5. PLANNING POLICY CONTEXT

The proposed Development will be considered under Section 36 (S.36) of the Electricity Act 1989. As part of the S.36 application process, the applicant will request that the Scottish Ministers issue a Direction under s.57(2) of the Town and Country Planning (Scotland) Act 1997 ("the 1997 Act") that deemed planning permission be granted for the proposed development.

Schedule 9 of the Electricity Act 1989 sets out environmental features which the decision maker must have regard to and identifies that mitigation must be considered. Sub-paragraph 1 is relevant to an applicant if they hold a License at the date the application is submitted. SPR do hold such a licence. Sub Paragraph 1 states:

"*In formulating any relevant proposals, a licence holder or a person authorised by exemption to generate, transmit, distribute or supply electricity*

(a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and

(b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."

Sub-paragraph 2 applies to all applicants and refers to sub paragraph 1. Sub-paragraph 2 states:

"*In considering any relevant proposals for which his consent is required under section 36 or 37 of this Act, the Secretary of State shall have regard to —*

(a) the desirability of the matters mentioned in paragraph (a) of sub-paragraph (1) above; and

(b) the extent to which the person by whom the proposals were formulated has complied with his duty under paragraph (b) of that sub-paragraph."

The planning input to the EIA Report will focus on the relevant development plan, and material considerations. The EIA Report will not assess the proposed Development against the relevant planning policy. This will be done in a separate Planning Statement. The Planning Statement will consider the balance of effects of the proposed development as set out in the EIA, in the context of the statutory requirements of the 1989 Electricity Act, Development Plan policy and other material considerations.

The Development Plan

The majority of the Site is located within the administrative area of SAC. The site entrance is located within the administrative area of D&GC. The Development Plan for the Site therefore comprises:

- South Ayrshire Local Development Plan (2014) and associated Supplementary Guidance; and
- Dumfries and Galloway Local Development Plan (2014) and associated Supplementary Guidance.

The development plan will be considered for the proposed development within that administrative area. As the proposed turbines would be located in SAC the Development Plan polices relevant to windfarm development will be considered. In the case of the development in D&GC the development relates to traffic and the traffic and transport policies will be considered.

South Ayrshire Local Development Plan

The South Ayrshire Local Development Plan (SALDP) was adopted on the 23rd of September 2014. SAC are currently working on a new Local Development Plan which would supersede the SALDP, however this is not expected to be published for public consultation until the end of 2018. The SALDP is therefore considered to be a relevant and up to date Local Development Plan. The Wind Energy Policy is considered to be the most relevant SALDP Policy to the proposed Development. The LDP Wind Energy Policy states that proposals will be supported if:

a) they are capable of being accommodated in the landscape in a manner which respects its main features and character (as identified in the South Ayrshire Landscape Wind Capacity Study or in any subsequent updates to that study), and which keeps their effect on the landscape and the wider area to a minimum (through a careful choice of Site, layout and overall design);
b) they do not have a significant detrimental visual impact, taking into account views experienced from surrounding residential properties and settlements, public roads and paths, significant public viewpoints, and important recreational assets and tourist attractions;
c) they do not have any other significant detrimental effect on the amenity of nearby residents, including from noise and shadow flicker;
d) they do not have a significant detrimental effect on natural heritage features, including protected habitats and species, and taking into account the criteria in LDP policy: natural heritage;
e) they do not have a significant detrimental effect on the historic environment, taking into account the criteria in LDP policy: historic environment and LDP policy: archaeology;
f) they do not adversely affect aviation, defence interests and broadcasting installations; and
g) their cumulative impact in combination with other existing and approved wind energy developments, and those for which applications for approval have already been submitted, is acceptable.

The following policies are also considered to be relevant to the proposed Development and will be considered during the design and development of the proposed windfarm:

- LDP Policy: Renewable Energy;
- LDP Policy: Landscape Quality;
- LDP Policy: Protecting the Landscape;
- LDP Policy: Woodland and Forestry;
- LDP Policy: Preserving Trees;
- LDP Policy: Historic Environment;
- LDP Policy: Archaeology;
- LDP Policy: Natural Heritage;
- LDP Policy: Land use and Transport; and
- LDP Policy: Outdoor Public Access and Core Paths.

South Ayrshire Local Development Plan (2014) Supplementary Guidance; Wind Energy (2015):

The Supplementary Guidance: Wind Energy (2015) document outlines the Spatial Framework for wind energy development within South Ayrshire. This Spatial Framework identifies areas which have potential

for windfarm development and those which do not, or those which require significant protection. In addition to this the Supplementary Guidance refers to the South Ayrshire Landscape Wind Capacity Study (SALWCS) which provides advice on landscape sensitivities, thresholds and cumulative issues amongst other things. The SALWCS places the site within a Landscape Character Type (LCT) that has been identified as a Search Area for the Large Typology (Turbines >70m).

Dumfries and Galloway Local Development Plan (2014)

The Dumfries and Galloway Local Development Plan (DGLDP) was adopted in September 2014. D&GC are currently working on a new Local Development Plan which will supersede the DGLDP, however this is not expected to come into force until September 2019. The DGLDP is therefore considered to be a relevant and up to date Local Development Plan Policy. Policy T1 Transport Infrastructure is considered to be the most relevant DGLDP policy to the proposed Development. Policy T1: Transport Infrastructure states that proposals relating to existing and new transport infrastructure should accord with the regional and local transport strategies and also not have any adverse effects on designated Natura Sites.

DGLDP Policy IN2: Wind Energy, also has some relevance as the proposed Development would include a site access for windfarm development. Policy IN2 states that proposals will be assessed against set considerations, including the following:

- landscape and visual impact;
- cumulative impact;
- impact on local communities; and
- impact on aviation and defence interests.

The impact on local communities as a result of the transportation of the turbines will be considered in the EIA process.

There is no relevant Supplementary Guidance which relates to the type of works proposed in the D&GC area.

Scottish Government Policy and Targets

On 28 February 2018 the Scottish Government outlined a new target of reducing greenhouse gas emissions by 66% by 2032 with the publication of the Climate Change Plan, third report: proposals and policies 2018-2032. The reduction figure is to be measured against the 1990 baseline figures. This plan sets out the path to a low carbon economy while helping to deliver sustainable economic growth and secure the wider benefits to a greener, fairer and healthier Scotland in 2032. The Plan sits alongside the Scottish Energy Strategy 2017.

The Scottish Government published its Energy Strategy in December 2017. The Energy Strategy sets out the Scottish Government's vision for the future energy system in Scotland, for the period to 2050. The strategy is designed to provide a long term vision to guide detailed energy policy decisions over the coming decades. It articulates the priorities for an integrated system-wide approach that considers both the use and the supply of energy for heat, power and transport. The main document was published alongside the Onshore Wind Policy Statement.

The Strategy advises that for Scotland to meet the domestic and international climate change targets, the Government will set a new 2030 'all-energy' target for the equivalent of 50% of Scotland's heat, transport

and electricity consumption to be supplied from renewable sources. It advises that it has a vision for the following:

- for Scotland to be a world leader in renewable and low carbon technologies and services; and
- for shared ownership of renewables and of local energy systems to maximise the benefits to Scotland's communities.

The statement has been prepared to reaffirm the existing Scottish Government's onshore wind policy set out in previous publications and seeks views on a number of issues related to supporting the onshore windfarm sector. It includes separate sections on the following key priority areas:

- route to market;
- repowering;
- developing a strategic approach to new development;
- barriers to deployment;
- protection for residents and the environment;
- community benefits; and
- shared ownership.

The strategy contains a number of goals in respect of onshore wind which include:

- setting a challenge to the onshore industry to make Scotland the first area in the UK to host commercial onshore wind development without subsidy;
- consulting on the appropriate approach to the inclusion of windfarm efficiency as a material consideration in the Section 36 consents guidance (e.g. through siting, design, bigger turbines, etc.);
- repowering: the established land use will be a material consideration in determination of any application for a repowering proposal. In each case, a new consent will need to be applied for, notwithstanding the steer now in SPP that areas identified for new proposals continue to be sited for use "in perpetuity";
- ruling out both a national strategic approach to planning and regional targets. Consulting on a 'locally coordinated approach' or business as usual;
- shared ownership: the Scottish Government does not intend to prescribe any particular model, however it encourages stakeholders to adopt the high level principles outlined in the Onshore Wind policy statement;
- measures to support cost reduction, referring to the recommendations in Scottish Renewables & Everoze's Onshore Wind report (2016).

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National Planning Policy, Guidance and Advice

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

- Scottish Planning Policy (Scottish Government, June 2014);
- The National Planning Framework 3 (Scottish Government, June 2014);
- Onshore Wind Turbines Specific Advice Sheet (Scottish Government, updated May 2014);
- Onshore Wind Policy Statement (Scottish Government, December 2017);
- Scottish Energy Strategy (Scottish Government, December 2017);
- Planning Advice Note (PAN) 1/2011 Planning and Noise (Scottish Government, March 2011);
- PAN 2/2011 Planning and Archaeology (Scottish Government, July 2011);
- PAN 1/2013 Environmental Impact Assessment (Scottish Government, August 2013);
- PAN 51 Planning, Environmental Protection and Regulation (Scottish Government, October 2006);
- PAN 60 Planning for Natural Heritage (Scottish Government, January 2008);
- PAN 69 Planning and Building Standards Advice on Flooding (Scottish Government, August 2004);
- PAN 75 Planning for Transport (Scottish Government, August 2005); and
- PAN 79 Water and Drainage (Scottish Government, September 2006).

The Emerging Development Plan

Both SAC and D&GC have embarked on work to prepare their replacement Local Development Plans with the commencement of their second Local Development Plans (LDP2).

For SAC's LDP2, consultation on the Main Issues Report closed on 31st January 2018. The Main Issues Report advised that:

> *"In line with Scottish Planning Policy, LDP1 contained generally supportive policies for renewable energy development but sought to ensure that environmental and community impacts were acceptable. Additional guidance was provided by means of a new Supplementary Guidance (SG) document which sought to help identify which areas of the countryside had capacity for windfarms. This guidance was based on the criteria issued by Scottish Government and it received accolade as an exemplar of good practice.*
>
> *South Ayrshire has followed Scottish Government advice in preparing a spatial strategy for windfarm development and has determined applications based on its assessment of likely impacts. Since adoption of the windfarm SG, only 2 windfarm applications have been determined. They were both refused by South Ayrshire Council, but one was subsequently approved by the Scottish Government at appeal.*

Given that South Ayrshire has recently undertaken a full review of its spatial strategy, and that this is in full compliance with the latest Scottish Government requirements, it is not considered appropriate to implement a full review. However, the proposed assessment of the Scenic Areas (Local Landscape Areas) in line with SNH latest guidance (Main Issue 8) can be incorporated into the wind farm spatial strategy to clarify and strengthen wider understanding of the characteristics and importance of local landscape types which can be affected by wind farm development."

The next stage of the process to replace the existing Local Development Plan will be the drafting of the 'Proposed Plan' document. The Proposed Plan will contain the Council's settled/preferred position on future development Sites, strategies and policies. It is anticipated that the Plan will be published at the end of 2018 for public consultation.

For Dumfries and Galloways LDP2, the proposed Plan and draft Supplementary Guidance was published for 13 weeks from 29th January to 30th April 2018, to allow representations from the public. The proposed Plan maintains Policy IN2: Wind Energy, with no significant changes made to this policy. The LDP2 is expected to come into force in September 2019. A Draft of the Wind Energy Development: Development Management Considerations Supplementary Guidance was published in January 2018. This draft Supplementary Guidance is proposed to provide additional detail on the criteria contained in part 1 of Policy IN2: Wind Energy from the draft LDP2.

Shared Ownership and Community Benefit

Shared ownership and community benefit, whilst different, are interlinked and could be valuable to a community located within proximity to the proposed development. The two benefits can be summarised as follows:

- Shared ownership involves agreeing a contract with a developer so that an investment is made and the community receives income from a windfarm; and
- Community benefit is usually a direct payment to the community, linked to the power output of the windfarm i.e. an annual fee per MW.

The Scottish Government promotes both forms of community involvement in renewable energy schemes, with its most recent guidance (2017) promoting shared ownership to potentially enhance levels of benefit received by a community within areas hosting renewable energy developments. The EIA Report will consider the impacts associated with shared ownership and community benefit.

QUESTIONS

Q1: Confirmation is sought that the identified development plan policies are appropriate.

Q2: Are there any further policies which would be considered likely to be material to the determination of the application?

6. LANDSCAPE AND VISUAL

Introduction

The Landscape and Visual Impact Assessment (LVIA) will be prepared by SLR's Chartered Landscape Architects in accordance with current guidance. The LVIA will identify and assess the potential effects during the construction and operational stages that the proposed Development may have on the landscape and visual resource of the study area. It will focus on the potentially significant effects and accordingly, non-significant effects which it is proposed to scope out of the detailed LVIA are identified in this Report. The LVIA will also outline the approach taken to the design of the proposed Development as well as mitigation measures that would be implemented to prevent, reduce, or offset potential adverse landscape and visual effects.

Potential Sources of Impact

The proposed Development would have a direct impact on the landscape fabric or physical elements of the landscape on the Site due to the removal or alteration to the vegetation / forestry and land cover to accommodate the various components of the windfarm. The main source of landscape and visual impacts from the proposed Development would be the appearance of the turbines from the surrounding landscape resource and in views obtained by people in the surrounding area. The effect of other elements of the proposed Development which may be visible from the surrounding area, such as the access track and substation will be assessed.

The following identifies potential effects as a result of the proposed Development which will be assessed in detail in the EIA Report:

- the design of the proposed Development in relation to the landform of the Site and immediately surrounding area as well as the existing operational windfarms of Arecleoch and Kilgallioch as well as other operational windfarms in the wider area including Mark Hill approximately 3.5km to the north east of the Site;
- simultaneous and sequential views of the proposed Development with cumulative windfarms located within the Plateau Moorland with Forest Landscape character Type (LCT), when viewed from the small scale, well-settled and more sensitive landscapes of the Stinchar and Duisk Valleys, respectively to the north west and north east of the Site;
- effects on views and visual amenity of residents of the village of Barrhill (approximately 2km from the Site), as well as other nearby residential properties and settlements in the LVIA study area;
- effects on the South Ayrshire Scenic Area (SA) including cumulative effects;
- effects on views to and from, the Galloway Forest Park, where additional windfarm developments could combine with the existing windfarms to form a more concentrated band of development potentially contributing to an 'encircling' effect on key hills such as The Merrick and related Wild Land Area;
- effects on views from the A714 road including cumulative effects;
- the design of ancillary elements including access roads, crane hard standings, substation, borrow pit and, especially where they may visible from the neighbouring River Duisk valley; and
- cumulative effects of the proposed Development in conjunction with the consented Chirmorrie, Stranoch wind farms to the south and Altercannoch to the east currently at appeal.

Study Areas

The currently proposed turbines are up to 200m to blade tip height. Consequently, in accordance with Scottish Natural Heritage (SNH) guidance (2017[4]), the study area will be 45km radius from the outer edges of the proposed turbines.

Also in accordance with SNH's cumulative guidance (2012[5]) a plan showing windfarms within 60km will be prepared identifying the location and status of these developments. However, it is proposed that the study area for the cumulative assessment will be 45km.

Zones of Theoretical Visibility

Computer generated Zones of Theoretical Visibility (ZTVs) from a starting point for the LVIA as they will identify the parts of the study area which will have potential visibility of the development in terms of Landscape Character Types, (LCTs) landscape designations and visual receptors (see Figures 6.1 – 6.3).

In addition to blade and hub height ZTVs, cumulative ZTVs for the wind farm developments agreed to be included in the assessment will be prepared. Analysis of the cumulative ZTVs will inform the selection of sequential routes through the landscape to be assessed.

Consultation

Consultation meetings are proposed to be held with South Ayrshire Council (SAC) and SNH in order to identify and agree the key matters likely to be of concern which should be addressed in the LVIA. We will explain our proposed approach to design development and mitigation. Agreement will also be sought on the proposed methodology, study areas and preliminary list of viewpoint locations issued with this Report.

Further consultations will be carried out to agree the scope of the cumulative assessment and identify wind farms that are relevant to the identification of significant cumulative effects from the proposed development, as well as the final selection of representative viewpoints and related visualisation requirements.

Method of Assessment and Reporting

LVIA Methodology

The LVIA of the proposed Development will be undertaken to assess the potential effects of the proposed Development on the landscape resource and visual amenity within a 45km radius study area and to identify significant effects. The assessment will also address potential cumulative landscape and visual effects.

The aim of the LVIA is to identify, predict and evaluate potential effects arising from the proposed Development. Wherever possible, identified effects are quantified, but the nature of landscape and visual assessment requires interpretation by professional judgement. In order to provide a level of consistency to the assessment, landscape sensitivity to change, the prediction of magnitude of impact and assessment of significance of the residual effects has been based on pre-defined criteria which are based on guidance

[4] Scottish Natural Heritage. 2017. Visual Representation of Windfarms Good Practice Guidance, Version 2.2. SNH, Battleby.
[5] Scottish Natural Heritage. 2012. Guidance – Assessing the Cumulative Impact of Onshore Wind Energy Developments. Scottish Natural Heritage. Battleby

provided in the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3[6]), as refined for the purposes of windfarm assessment and taking account of SNH guidance listed in Section 6.3.2 of this document.

Landscape sensitivity will be assessed by combining the value of the landscape as recognised through designation or by consideration of a range of other criteria (landscape quality, scenic quality, rarity, representativeness, conservation interest, recreational value, perceptual aspects and associations), with its susceptibility to change of the nature envisaged from wind farm development. Landscape susceptibility can be defined by consideration of landscape character, quality or condition, aesthetic and perceptual aspects as well as planning policies and strategies. Sensitivity will be defined as high, medium or low based on professional interpretation of a combination of parameters.

Viewpoint sensitivity will be assessed by combining the value of a particular view with susceptibility of the visual receptor which is a function of the occupation or activity of people at any particular location. Sensitivity will be defined as high, medium or low based on interpretation of a combination of parameters.

The magnitude of change arising from the proposed Development will be described as substantial, moderate, slight or negligible based on the interpretation of a number of largely quantifiable parameters, such as size of scale of change, geographical extent as well as duration and reversibility.

Landscape and visual effects will be assessed as major, major / moderate, moderate, moderate / minor, minor and negligible with effects identified as major, major / moderate being considered significant effects in terms of the EIA Regulations. Those effects falling outside the major or major/moderate categories are generally considered to be not significant.

References and Standard Guidance

The LVIA will be prepared in accordance with the GLVIA3, the assessment will take account of the following:

- South Ayrshire Local Development Plan, (2014);
- South Ayrshire Landscape Capacity Study for Wind Turbines (2013);
- Dumfries and Galloway Local Development Plan (2014);
- Dumfries and Galloway Wind Farm Landscape Capacity Study, Revised and updated study report – EEI Committee (2016);
- Dumfries and Galloway Council Local Development Plan Technical Paper: Wind Energy Interim Spatial Framework Maps (2014);
- Dumfries and Galloway Council Local Development Plan Technical Paper: Regional Scenic Areas (2014);
- Siting and Designing Windfarms in the Landscape, Version 3, SNH (February 2017);
- Visual Representation of Windfarms - Good Practice Guidance, Version 2.2, SNH (February 2017);
- Assessing the Cumulative Impact of Onshore Developments, SNH, March (2012);

[6] The Landscape Institute, Institute of Environmental Management and Assessment. 2013. Guidelines for Landscape and Visual Impact. Routledge. London.

- Use of Photography and Photomontage in Landscape and Visual Assessment, Landscape Institute Advice Note, Consultation Draft (2018);
- Landscape Character Assessment, The Countryside Agency and SNH (SNH) 2002;
- SNH Commissioned Report No.111: Ayrshire Landscape Assessment, SNH (1998);
- SNH Commissioned Report No.94: Dumfries and Galloway landscape assessment, SNH (1998);
- SNH Commissioned Report No. 374: The Special Qualities of the National Scenic Areas, SNH (2010); and
- Description of Wild Land Area. SNH (2017).

The assessment will take cognisance of relevant national and local landscape planning policy.

Baseline Conditions

The establishment of baseline conditions relating to the landscape and visual resource will involve a combination of desk study, preparation and review of ZTV maps and visualisations as well as field work. A baseline description of the existing LCTs landscape designations and visual amenity receptors within the proposed 45km radius study area anticipated to incur significant effects will be assembled in the Baseline Assessment.

Landscape Character

Landscape Character information will be informed by the following publications and verified on site:

- Ayrshire Landscape Assessment[7]; and
- Dumfries and Galloway landscape assessment[8].

Additional data will be referenced from relevant capacity studies comprising:

- South Ayrshire Landscape Wind Capacity Study: Main Study Report (SALWCS)[9];
- East Ayrshire Landscape Wind Capacity Study: Main Study Report (EALWCS)[10]; and
- Dumfries and Galloway Wind Farm Landscape Capacity Study (DGWFLCS)[11].

The LCTs within the study area are shown on Figure 6.1.

[7] Land Use Consultants. 1998. SNH Commissioned Report No.111: Ayrshire Landscape Assessment. Scottish Natural Heritage. Battleby
[8] Land Use Consultants. 1998. SNH Commissioned Report No.94: Dumfries and Galloway landscape assessment, Scottish Natural Heritage. Battleby
[9] Carol Anderson Landscape Architects. 2013. South Ayrshire Landscape Wind Capacity Study: Main Study Report. South Ayrshire Council.
[10] Carol Anderson Landscape Associates. 2013. East Ayrshire Landscape Wind Capacity Study: Main Study Report. East Ayrshire Council.
[11] Carol Anderson Landscape Associates. 2016. Dumfries and Galloway Wind Farm Landscape Capacity Study, Revised and updated study report – EEI Committee. Dumfries and Galloway Council.

The proposed Development will be located within the Plateau Moorland with Forest sub-type LCT and in close proximity to the Intimate Pastoral Valley LCT covering the Duisk and Stinchar rivers to the north of the Site.

Table 6.1 identifies all of the LCTs within the 45km study area and includes analysis of the ZTV to identify which of the LCTs would be affected by the proposed Development and subsequently assessed in the LVIA, and those which will be scoped out of the assessment.

The LVIA will focus on assessment for the LCTs predicted to receive theoretical visibility and potentially incur significant effects. It will include a description of their value, susceptibility to change culminating in their overall sensitivity to change.

Table 6.1: Landscape Character Types – Theoretical Visibility

LCT Ref No.	LCT Name	Potential for Visibility of the proposed Development (based on the ZTV)	Approx. distance to the nearest turbine (km)	Inclusion in the assessment
AYS1	Raised Beach Coast	Yes, limited to 19.2% of the overall LCT within 10km of the proposed Development	8.0	No
AYS3	Coastal Fringe with Agriculture	Yes, 80.4% of the overall LCT is predicted to receive theoretical visibility but at a distance of 38km	39.5	No
AYS4	Coastal Headland	Yes, 12.6%of the overall LCT is predicted to receive theoretical visibility but at a distance of 30km	30.7	No
AYS5	Coastal Valley with Policies	Yes, very limited to 1.6% of the overall LCT at a distance of 25km	25.7	No
AYS7	Ayrshire Lowlands	No theoretical visibility	36.7	No
AYS9	Lowland River Valleys	No theoretical visibility	33.9	No
AYS10	Upper River Valleys	No theoretical visibility	34.2	No
AYS11	Lower Dale	Yes, limited to 6.4% of the overall LCT at a distance of 14km	14.1	No
AYS12	Middle Dale	Yes, limited to 1.8% of the overall LCT at a distance of 17km	17.2	No
AYS13	Intimate Pastoral Valley	Yes, 56.6% of the LCT is predicted to receive theoretical visibility of the proposed Development	1.4	**Yes**
AYS14	Upland Glen	Yes, 32.7% of the LCT would experience theoretical visibility from within 1km from the proposed Development	0.6	**Yes**
AYS15	Upland Basin	No theoretical visibility	46.5	No
AYS17	Foothills	Yes, theoretical visibility limited to 19.8% of the LCT but would be experienced from 5km from the	5.2	**Yes**

LCT Ref No.	LCT Name	Potential for Visibility of the proposed Development (based on the ZTV)	Approx. distance to the nearest turbine (km)	Inclusion in the assessment
		proposed Development		
AYS18	Foothills with Forest	Yes, limited to 7.1% of the overall LCT at a distance of 15km	15.1	No
AYS19	Plateau Moorland	Yes, 79.1% of the LCT would receive theoretical visibility from within a 1km from the proposed Development	0.4	**Yes**
AYS20	Plateau Moorland with Forest	Yes, 76% of the LCT would receive theoretical visibility	Proposed Development located within LCT.	**Yes**
AYS22	Rugged Moorland Hills Valleys with Forest	Yes, 53.7% of the LCT would receive theoretical visibility from over 42km away	42.6	No
AYS23	Southern Uplands	Yes, theoretical visibility limited to 19.1% of the LCT but would be experienced from within 5km of the proposed Development	3.1	**Yes**
AYS24	Southern Uplands with Forest	Yes, theoretical visibility limited to 25.1% of the LCT but would be experienced from within 2km of the proposed Development	1.4	**Yes**
AYS25	Rugged Granite Uplands	Yes, 31.8% of the LCT would receive theoretical visibility on higher slopes and summits from within 20km of the proposed Development.	19.8	**Yes**
AYS26	Rugged Granite Upland with Forest	No theoretical visibility	24.1	No
AYS27	Rocky Volcanic Islands LCT	Yes, 65.6% of the LCT would receive theoretical visibility	22.6	**Yes**
DGW1	Peninsula	Yes, limited to 23.7% of the overall LCT from a distance of 13km	17.3	No
DGW2	Peninsula with Gorsey Knolls	Yes, 45.5% of the LCT would receive theoretical visibility but from 39km away	39.5	No
DGW3	Coastal Flats	Yes, 16.4% of the LCT would receive theoretical visibility but from 18km away	18.3	No
DGW4	Shallow Flat-Bottomed Valley	Yes, very limited theoretical visibility at 1.6%	12.1	No
DGW5	Narrow Wooded River Valleys	Yes, 13.8% of the LCT would receive theoretical visibility but from 20km away	13.0	No
DGW9	Flooded Valley	No theoretical visibility	40.1	No

LCT Ref No.	LCT Name	Potential for Visibility of the proposed Development (based on the ZTV)	Approx. distance to the nearest turbine (km)	Inclusion in the assessment
DGW11	Upland Glens	No theoretical visibility	52.0	No
DGW12	Moss and Forest Lowland	Yes, 48.8% of the LCT would receive theoretical visibility from 19km away	19.5	**Yes**
DGW13	Drumlin Pasture in Moss and Moor Lowland	Yes, 25.4% of the LCT would receive theoretical visibility from 14km away	14.7	**Yes**
DGW14	Drumlin Pastures	Yes, limited to 24.6% of the LCT would receive theoretical visibility from 23km away	23.3	No
DGW17	Upland Fringe	Yes, 19.1% of the LCT would receive theoretical visibility from the higher slopes and hill summits	13.4	**Yes**
DGW18	Plateau Moorland	Yes, 49.2% of the LCT would receive theoretical visibility within 5km of the proposed Development	2.6	**Yes**
DGW19	Plateau Moorland with Forest	Yes, 49.8% of the LCT would receive theoretical visibility within 5km of the proposed Development	3.8	**Yes**
DGW20	Foothills	Yes, limited to 21.5% of the LCT would receive theoretical visibility but at a distance of over 35km from the proposed Development	35.5	No
DGW21	Foothills with Forest	Yes, limited to 8.3% of the LCT would receive theoretical visibility but at a distance of 23km from the proposed Development	23.8	No
DGW22	Southern Uplands	Yes, 5.9% of the LCT would receive theoretical visibility from 4km away	4.2	**Yes**
DGW23	Southern Uplands with Forest	No visibility	29.1	No
DGW24	Coastal Granite Uplands	Yes, 28.4% of the LCT would receive theoretical visibility of the proposed Development.	29.2	No
DGW25	Rugged Granite Uplands	Yes, 15.2% of the LCT would receive theoretical visibility of the proposed Development.	18.9	No

The SALWCS places the site within Character Type 18C: Plateau Moorlands with Forestry and Wind Farms suggesting that, in addition to the modifying effect of commercial forestry, wind energy development has become a key landscape characteristic in recent years. This LCT has been identified as a Search Area for the Large Typology (Turbines >70m) having a medium-low sensitivity to turbines over 70 metres in height (Section 25.4, Page 68). The scope for development of large turbine windfarm developments within this area will be identified and considered in the LVIA.

Landscape Designations

No international, national or regional landscape designations occur within the Site. However, the northern and eastern boundaries of the application boundary abut with the South Ayrshire Scenic Area (SA).

Table 6.2 identifies all of the landscape designations within the 45km study area as shown on Figure 6.2.

Table 6.2: Landscape Designations – Theoretical Visibility

Landscape Designation	Potential for Visibility of the proposed Development (based on the ZTV)	Approx. distance to the nearest turbine (km)	Inclusion in the assessment
Fleet Valley National Scenic Area (NSA)	Yes, very limited to 0.39% of the overall NSA from 31km away	38.0	No
South Ayrshire Scenic Area (SA)	Yes, 25% of the overall designation would receive theoretical visibility of the proposed Development	0.9	**Yes**
East Ayrshire Sensitive Landscape Area (EASLA)	Yes, limited to 0.1% of the overall designation at a distance of 15km	24.3	No
Galloway Hills Regional Scenic Area (RSA)	Yes, 12% of the overall designation would receive theoretical visibility of the proposed Development from 5km away	13.7	**Yes**
Thornhill Uplands RSA	No theoretical visibility	51.5	No
Rhins Coast RSA	Yes, limited to 9% of the overall designation would receive theoretical visibility of the proposed Development	14.2	No
Mochrum Lochs RSA	Yes, limited to 29% of the overall designation would receive theoretical visibility of the proposed Development from 21km	24.5	No
Machars Coast RSA	Yes, limited 14% of the overall designation would receive theoretical visibility of the proposed Development from 34km	37.7	No
Ardwell House Gardens and Designed Landscapes (GDL)	Yes, 58% of the overall designation would receive theoretical visibility of the proposed Development but from 28km	32.4	No
Auchincruive GDL	No theoretical visibility	45.5	No
Bargany GDL	No theoretical visibility	18.6	No
Blairquhan GDL	No theoretical visibility	28.9	No
Cally GDL	No theoretical visibility	44.9	No
Castle Kennedy GDL	Very limited theoretical visibility	17.1	No
Craigengillan GDL	No theoretical visibility	33.1	No
Culzean Castle GDL	No theoretical visibility	26.9	No
Dumfries House GDL	No theoretical visibility	50.6	No
Galloway House GDL	Yes, 20% of the overall designation	41.7	No

Landscape Designation	Potential for Visibility of the proposed Development (based on the ZTV)	Approx. distance to the nearest turbine (km)	Inclusion in the assessment
	would receive theoretical visibility of the proposed Development but from 37km		
Glenapp GDL	Yes, 71% of the overall designation would receive theoretical visibility of the proposed Development from 5km	7.3	**Yes**
Kilkerran GDL	No theoretical visibility	22.5	No
Lochryan GDL	No theoretical visibility	15.2	No
Logan House (Balzieland) GDL	Yes, 87% of the overall designation would receive theoretical visibility of the proposed Development but from 33km	35.4	No
Monreith GDL	Very limited theoretical visibility	37.7	No
Rozelle (La Rochelle) GDL	No theoretical visibility	39.7	No
Skeldon House GDL	No theoretical visibility	36.5	No

The qualifying elements of the designated landscapes which are within the ZTV and anticipated to incur potentially significant effects will be identified where possible from published sources and the LVIA will assess the effects of the proposed Development against their key qualities. This will have regard to likely actual visibility taking account of local landform and vegetation, and those considered likely to incur effects included in the assessment.

Wild Land

The Merrick wild land area (SNH,2017[12]) lies to the north-east of the study area as shown on Figure 6.2 at approximately 18.1km from the Indicative Turbine Developable Area.

The LVIA will provide an assessment for the landscape designations and wild land area predicted to receive theoretical visibility and include a description of their value and susceptibility to change to identify their overall sensitivity to change, and assess any potentially significant effects on these resources.

Visual Amenity

The range of visual receptors within the study area will be identified which is anticipated to include the following:

- residential properties within 2km of the proposed Development will be the subject of a Residential Visual Amenity Survey which will form a Technical Appendix of the ES;
- settlements including Barrhill, Colmonell, and Pinwherry;
- road users on the A714 road (Girvan – Newton Stewart), B7027 and B734 roads, and Railway users travelling on the Girvan to Stranraer railway line;
- walkers on the Southern Upland Way (SUW) and other Scotways long distance footpaths as well as Core Paths and the many summits within the Galloway Hills;

[12] Buchan, N., Stanton, C.. 2017. Description of Wild Land Area. Scottish Natural Heritage. Battleby

- users of the cycle network including National Cycle Route 7 (Lochs and Glens South); and
- recreational visitors to attractions including the Galloway Forest Park, and Galloway Dark Skies Park. In addition, the many visitors to outdoor pursuits within the Galloway Hills and wider area.

Viewpoints

Initial ZTV analysis has been carried out based on the currently proposed turbine layout for the proposed Development in order to identify a list of suggested viewpoints representative of the main landscape and visual receptors within the study area, and at varying distances, directions and elevations from the proposed Development (see Figure 6.3). Viewpoints have been selected to represent a range of views and viewer types; including settlements, transport routes, recreational routes, main visitor locations, LCTs and landscape designations. The context of views currently experienced by visual receptor locations will be described in the viewpoint assessment.

The final selection of viewpoints for assessment will be agreed with SAC, DGC and SNH during the consultation process.

In order to keep the LVIA focussed and to ensure a proportionate approach is taken to the scope of the assessment and associated figures, we propose to identify two lists of viewpoints. The first list comprises viewpoints to be illustrated by visualisations and included in detailed assessment (see Table 6.3); and the second list, comprises viewpoints to be illustrated by wireline and scoped out of the detailed assessment as a result of the locations being unlikely to incur significant effects, as shown in Table 6.4 and Figure 6.3.

Table 6.3 – Viewpoints to be included in detailed assessment

VP No.	Viewpoint Location	Approx Grid Ref	LCT / Landscape Designation	Visual Receptor Type	Approx Elevation (m AOD)	Approx distance to the nearest turbine of Arecleoch Extension (km)	Direction of view to proposed Development
4	Knockdolian	211333, 584800	AYS13 - Intimate Pastoral Valleys LCT / South Ayrshire SA	Walkers	259	6.3	South east
5	Minor road near Colmonell	215513, 586824	AYS13 - Intimate Pastoral Valleys LCT / South Ayrshire SA	Road users	58	4.9	South east
6	Liglartrie	221110, 586014	AYS13 - Intimate Pastoral Valleys LCT / South Ayrshire SA	Residential receptors	56	4.7	South
7	SA61 Core Path / Craigneil Road	217111, 584684	AYS19 - Plateau Moorland LCT / South Ayrshire SA	Walkers	180	2.4	South east
9	Knockytinnal	222936, 584515	AYS13 - Intimate Pastoral Valleys LCT / South Ayrshire SA	Residential receptors	170	4.9	South east
10	Bellimore-on-Tig	214678, 582866	AYS14 - Upland Glen LCT / South Ayrshire SA	Residential receptors	181	2.5	East
11	Wallace Terrace, Barrhill	223646, 582046	AYS13 - Intimate	Road users	78	3.8	South west

VP No.	Viewpoint Location	Approx Grid Ref	LCT / Landscape Designation	Visual Receptor Type	Approx Elevation (m AOD)	Approx distance to the nearest turbine of Arecleoch Extension (km)	Direction of view to proposed Development
			Pastoral Valley LCT / South Ayrshire SA				
12	A714 road near Blairhall Farm	224383, 581623	AYS13 - Intimate Pastoral Valley LCT / South Ayrshire SA	Road users	86	4.1	South west
13	Minor road to the south of Barrhill	222616, 581282	AYS13 - Intimate Pastoral Valley LCT / Plateau Moorland with Forest LCT / South Ayrshire SA	Road users	140	2.5	West
14	A714 road near Corwar House	228249, 580897	AYS19 - Plateau Moorland LCT / South Ayrshire SA	Road users	172	7.4	West
15	Chirmorrie Cairn	220553, 576607	AYS19 - Plateau Moorland LCT	Walkers	257	1.8	North
16	Knockycoid	226217, 579075	AYS20 - Plateau Moorland with Forest LCT / South Ayrshire SA	Residential receptors Road users	112	5.1	West

Table 6.4 – Viewpoints to be illustrated by wireline and scoped out of the detailed assessment

VP No.	Viewpoint Location	Approx. Grid Ref	Landscape Character Type (LCT) / Landscape Designation	Visual Receptor Type	Approx. Elevation (m AOD)	Approx. distance to the nearest turbine of the Arecleoch Extension (km)	Direction of view to proposed Development
1	Ailsa Craig	201922, 599780	AYS27 - Rocky Volcanic Island LCT	Visitors	327	23.2	South east
2	Auchensoul Hill	226393, 594555	AYS17 - Foothills LCT / South Ayrshire SA	Walkers	312	14.8	South west
3	B734 road near Pinmore	220724, 590052	AYS13 - Intimate Pastoral Valleys LCT / South Ayrshire SA	Road users	91	8.2	South
8	The Merrick	242750, 585515	Rugged Granite Uplands LCT / Galloway Hills RSA	Walkers	842	22.6	South west
17	Hill of Ochiltree (Glenvernoch Fell)	232711, 574115	DGW19 - Plateau Moorland with Forest LCT	Walkers (SUW)	181	12.5	North west
18	SUW, Knockniehourie	221289, 568257	DGW18 - Plateau Moorland with Forest LCT	Walkers (SUW)	184	10.2	North west
19	Cairnsmore of Fleet	250200, 567100	DGW24 - Coastal Granite Uplands LCT / Galloway Hills RSA	Walkers	709	31.4	North west
20	Braid Fell	211224, 566469	DGW18 - Plateau Moorland LCT	Walkers / Road users	233	15.0	North

Method of Assessment and Reporting

Night Time Assessment

An assessment of the effects of aviation lighting will be carried out as part of the LVIA. This will be based on preparation of night time visualisations for four locations. It is suggested that these should be: Viewpoint 6, Liglartrie; Viewpoint 9, Knockytinnal; Viewpoint 13, Minor road south of Barrhill; and Viewpoint 16, Knockycoid. The existing night time context at these viewpoints will be described, with the related sensitivity identified and the magnitude of change arising from the aviation lighting of the proposed Development will be assessed for these locations. The predicted effects of aviation lighting on landscape character and visual amenity at these viewpoints will be drawn on to provide general comment on the likely effects in the wider study area.

Residential Visual Amenity

There is no published guidance on the method and best practice for conducting an appraisal of effects on residential visual amenity of dwellings in the locality of a windfarm. The Residential Visual Amenity Study (RVAS) will therefore be based on SLR's previous experience of undertaking such studies with the conclusions based on professional judgement, underpinned by the visual information including wirelines, photography, aerial photos and site visits from publicly accessible locations.

A detailed assessment of potential visual effects on residential properties within a 2km study area (measured from the nearest proposed turbines) will be undertaken as follows:

- a ZTV based on DTM data will be produced for the study area and locations of all residential properties within the ZTV will be identified and allocated a reference number;
- photography/wirelines and detailed description of existing and proposed views from outside residential properties or groups of properties within the ZTV will be prepared. (Note: this will not include views from within properties or photomontages); and
- where possible, objective data will be used, e.g. distance and direction of view to turbines from residential properties, or groups of properties and percentage of available view occupied by proposed Development to assess the nature of the anticipated change to residential visual amenity.

Cumulative Development

The approach used to determine cumulative effects will draw on guidance on cumulative impact assessment published by SNH[13] (2012).

The list of windfarms to be included in the assessment will initially be compiled from known wind farm planning applications and from information held by South Ayrshire, East Ayrshire and Dumfries & Galloway Councils relating to windfarm developments within the 45km study area. The initial review of cumulative sites will extend to 60km from the proposed Development including all wind turbine developments that are operational, under construction, consented, or planning applications and are over 50m to tip height. Developments at Scoping stage are not included, except where they are within 10km for the proposed development, and/or are included at the request of South Ayrshire Council.

[13] Scottish Natural Heritage. 2012. Guidance – Assessing the Cumulative Impact of Onshore Wind Energy Developments. Scottish Natural Heritage. Battleby

Whilst the initial review of cumulative sites extends to 60km, the study area for cumulative assessment will generally focus 45km radius from the outer boundary of the proposed turbines.

The analysis of the cumulative ZTVs will establish the general patterns of theoretical cumulative visibility within the study area.

Operational wind farms are a key component within the vicinity of the site and include the operational Arecleoch Windfarm (60 turbines, 118m high (consented at 135m)) and, north east of the site, Mark Hill Windfarm (28 turbines, 110m high) as well as Kilgallioch Windfarm (94 turbines of 146.5m in height and 2 turbines with a height of 125m) which has recently entered its operational phase and is located 2km south of the site. A review of cumulative windfarms will be undertaken as part of the EIA at an appropriate stage in the process. The list of cumulative sites to be considered in the EIA will be consulted upon prior to the list being finalised for assessment.

Wind Farm Design and Development

The proposed Development is at an early stage of design with environmental baseline data being gathered and assessed which will inform the layout development. It is envisaged that landscape and visual considerations will be a key input to the design development process. Analysis of the landscape of the site and immediately surrounding area will be undertaken to identify key landscape and visual characteristics and sensitivities. Key cumulative sites to be considered in addition to the existing Arecleoch Wind Farm include Mark Hill (operational), Kilgallioch (operational), Stranoch (consented), Chirmorrie (consented) and Altercannoch (in planning).

Following completion of the main baseline landscape and visual assessment, design objectives will be developed and used to evaluate a series of layout options. These layouts will be examined from key design viewpoints to assess and optimise the number, size and layout of the proposed turbines in relation to the landform of the site and surrounds as well as adjacent wind farm development. The design iteration process will take account of other environmental and technical factors to establish the final layout for the proposed wind farm. The design optimisation process will be reported and illustrated in the EIA Report.

Reference to the sensitivities and recommendations within the SALWCS for Wind Turbines (2013) will be also considered within the design development and assessment.

Assessment

Once the baseline landscape and visual context has been established and following completion of the design optimisation process, the detailed assessment will be undertaken.

The assessment will be carried out in accordance with the agreed methodology to identify the susceptibility and overall sensitivity of the landscape and visual receptors in the study area, as well as the magnitude of change, including cumulative change and related effects on these receptors caused by the proposed Development.

An assessment of the potential effects on both landscape character and visual amenity arising from the proposed Development at each of the agreed viewpoints will be carried out. This assessment will involve the production of computer generated wirelines and, in some cases, photomontages to predict the views of the proposed turbines from each of the agreed viewpoints. The existing and predicted views from each of these viewpoints will be analysed to identify the magnitude of change and the residual effects on landscape character and visual amenity based on field work as well as desk based assessment.

The findings of the LVIA will draw on the viewpoint assessment as well as desk study and field work to identify potentially significant effects on landscape character, landscape designations and visual amenity receptors in the study area.

The LVIA input to the EIA Report will include the following:

- LVIA Chapter;
- Appendix 6.1: LVIA Methodology;
- Appendix 6.2: Landscape Assessment;
- Appendix 6.3: Visual Assessment;
- Appendix 6.4: Residential Visual Amenity Survey;
- Appendix 6.5: Sequential Routes;
- Appendix 6.6: Cumulative Assessment; and
- Figures: to include ZTVs, LCT and landscape designations plans, visualisations and cumulative drawings.

QUESTIONS

Q3: Is the focused 45km study area for the landscape assessment considered to be appropriate?

Q4: Confirmation on the approach to the assessment of likely effects on wild land is requested.

Q5: Are the proposed viewpoint locations considered to be suitable for the LVIA.

Q6: Do consultees agree with the approach to the cumulative assessment

Q7: Do consultees agree with the approach to graphic and visualisation production?

Q8: Do consultees agree with the landscape and visual methodology and assessment evaluation criteria presented?

Q9: Are there any other relevant consultees who should be contacted with respect to the LVIA?

7. ECOLOGY

Introduction

This Section details the proposed scope of survey and assessment for the proposed Development. For ease of reference, within each section a brief summary is provided of the baseline surveys completed at the Site and the date that these surveys were completed. Given the extensive nature of the baseline surveys completed, consideration is given to whether the baseline data is sufficient, or whether any updates to the baseline are required to inform the Ecological Impact Assessment.

This Section of the Scoping Report has been prepared by MacArthur Green, who will also prepare the EIA chapter on Ecology. The proposed scope of survey and assessment for birds is considered separately in Section 8: Ornithology.

Environmental Baseline and Potential Sources of Impact

Baseline Conditions

Desk Study & Designated Sites

Table 7.1 details the designated Sites, designated for ecological features, within 5km of the Site.

Table 7.1: Designated Sites Details

Site	Designation	Designated Features	Distance from Site
Craig Wood SSSI	Site of Special Scientific Interest (SSSI)	Biological: Woodland: Upland oak woodland	1.52km
River Bladnoch Special Area of Conservation (SAC)	SAC	*Salmo salar* - Atlantic salmon	2.72km
Feoch Meadows (SSSI)	SSSI	Biological: Fens: Fen meadow; Biological: Lowland grasslands: Lowland neutral grassland	3.7km
Knockdaw Hill SSSI	SSSI	Biological: Upland habitats: Subalpine calcareous grassland Biological: Upland habitats: Subalpine dry heath Biological: Upland habitats: Subalpine wet heath Biological: Upland habitats: Alkaline fen Biological: Upland habitats: Upland assemblage	4.35km
Lendalfoot Hills Complex (SAC)	SAC	Alkaline fens Base-rich fens = *Calaminarian* grasslands of the *Violetalia; calaminariae* = Grasslands on soils rich in heavy metals; European dry heaths = Dry heaths; Northern Atlantic wet heaths with *Erica tetralix* = Wet heathland with cross-leaved heath; Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe)* = Species-rich grassland with mat-grass in upland areas; Transition mires and quaking bogs = Very wet mires often identified by an unstable `quaking` surface	4.38km
Littleton and Balhamie Hills SSSI	SSSI	Biological: Upland habitats: Subalpine calcareous grassland Biological: Upland habitats: Alkaline fen Biological: Fens: Basin fen	4.45km

Figure 7.1 illustrates the designated sites located within 5km of the Site which have an ecological (non-ornithological) interest.

Glen App and Galloway Moors SPA & SSSI is designated for ornithological interests and therefore discussed in Section 8: Ornithology.

Based on the distances and the designated features at the above listed sites, connectivity is considered to be unlikely. Consequently, these would likely be scoped out from the ecological impact assessment.

The desk study to inform the Ecological Impact Assessment will gather information from a variety of online sources and consultation with conservation organisations, such as those listed below:

- Scottish Natural Heritage (SNH), including Sitelink;
- The National Biodiversity Network (NBN) Gateway website;
- South West Scotland Environmental Information Centre (SWSEIC);
- SAC and D&GC;
- The Scottish Leisler's Bat Project;
- Scottish Badgers; and
- The Bat Conservation Trust.

Field Surveys

The following surveys have been undertaken for the proposed Development:

- National Vegetation Classification (NVC) Surveys from 13th to 17th July 2015 and 27th to 31st July 2015 and 4th to 6th July 2018 to cover additional areas;
- Protected Species Surveys between 12th and 14th October 2015;
- Protected Species Survey between 19th and 21st June 2017 with an additional survey for water vole undertaken between the 6th and 9th September 2017;
- Bat Activity Surveys 2015 (temporal and spatial surveys);
- Bat Activity Surveys between 1st May 2017 and 2nd October 2017 (temporal surveys); and
- Fisheries Surveys in 2017 (electrofishing surveys).

Potential Additional Survey Requirements

There is the potential for ancillary infrastructure development primarily borrow pits and track widening to be located out with those areas which have been surveyed to date. In the event that such areas are put forward as part of the proposed Development they will be appropriately surveyed and assessed.

Habitats

The vegetation was surveyed using the NVC scheme (Rodwell, 1991-2000; 5 volumes) and in accordance with NVC survey guidelines (Rodwell, 2006).

In total 21 NVC communities were recorded at the proposed Development Site in 2015 along with various associated sub-communities, however only a small number of communities accounted for the majority of the Site (2018 data is still being processed and will be reported on at a later date.)

The most common and widespread semi-natural communities which make up the main bulk of the landscape are M25 *Molinia caerulea – Potentilla erecta* mire, M23 *Juncus effusus/acutiflorus – Galium palustre* rush-pasture and M6 *Carex echinata – Sphagnum fallax/denticulatum* mire. The remainder of the

study area is made up of a relatively small number of mainly mire, grassland and heath communities. It is also clear from the vegetation communities present and their composition that many habitats have been heavily influenced by anthropogenic interaction, with the single largest factor being the presence of widespread commercial conifer plantation and its associated drainage, drying and shading effects.

The categories of vegetation within the study area, based on data from the 2015 survey, include the following 21 NVC communities recorded during the survey:

- mires and flushes: M4, M6, M17, M19, M20, M23, M25;
- wet heaths: M15;
- dry heaths: H10, H12;
- grasslands and bracken: U2, U4, U20, MG1, MG9, MG10;
- woodland and scrub: W4, W11, W23;
- swamp and tall-herb fens: S12; and
- vegetation of open habitats: OV27.

To allow the conservation importance of these habitats to be determined, the survey results will be considered against the following sensitivity classifications comprising:

- Annex I of the Habitats Directive;
- Scottish Biodiversity List (SBL);
- Priority Peatland and Carbon Rich Soils;
- Potential Ground Water Dependant Terrestrial Ecosystems (GWDTE) habitats.

The NVC surveys completed in 2015 will be sufficient to inform the assessment for the areas covered at the time. No significant land-use changes have occurred since the surveys were undertaken Additional analysis of the data collected in 2015 and 2018 will provide further detail on habitats present and their quality.

Protected Species Surveys

The following text sets out the approach to protected species surveys with the exception on bats. Bats are dealt with under a separate heading.

Otter

All accessible watercourses within the Site were surveyed for otter field signs. Otter field signs and survey methods are described in Bang & Dahlstrøm (2001), Sargent & Morris (2003) and Chanin (2003).

Evidence of otter was recorded during the 2015 survey, with spraints recorded in eight locations. No protected features were recorded[14].

[14] Figure 7.2 includes protected species survey results from 2017 surveys, only, as the 2015 results are out of date and no longer relevant, other than having informed surveys undertaken in 2017.

The 2017 surveys (Figure 7.2) found similar levels of otter activity to that recorded in 2015. Spraints were recorded at fifteen different locations during the June survey, whilst two spraint records were recorded during the September survey. The spraints varied in age, from fresh to old and weathered. A potential resting Site was also recorded close to a watercourse under a tree root plate.

Suitable habitat for this species is present throughout the Site.

Water Vole

All watercourses within the Site were surveyed for water vole field signs following the methodology prescribed in Dean *et al.* (2016) and Strachan, Moorhouse and Gelling (2011).

There was no evidence of water vole recorded within the study area in 2015, although the good suitability of the habitat along the watercourses was noted as having potential to support the species. A water vole colony was recorded within the study area during the June 2017 survey, along a tributary to the Cross Water. The colony consisted of at least nine burrows and a total of six latrines were recorded (Figure 7.2). The surrounding habitat, which consisted of dense rush vegetation, made it difficult to fully determine the total number of burrows within the colony and it is possible that there were more present than were recorded. The colony is located within a stretch of habitat that contains historic clearfell, but offers good water vole habitat given the slow water flow, suitable bank substrate and vegetation. The second survey visit in September 2017 recorded two potential water vole burrows further north along a tributary to Cross Water, although no further signs of water vole were recorded within the vicinity. Several water vole droppings were recorded further downstream of the water vole colony recorded in June, although no burrows were recorded in this area.

Suitable habitat for this species is present throughout the Site.

Badger

Land with the potential to support badger within the Site was searched for field signs with particular attention given to areas around woodland and areas underlain by mineral soils. Field signs of badger are described in Neal and Cheeseman (1996), Bang and Dahlstrøm (2001), and Scottish Natural Heritage (2001).

No evidence of badger was recorded during the 2015 survey visit. The presence of suitable habitat with the potential to support badgers within the vicinity of the Site was noted.

During the June 2017 survey, badger footprints were recorded along a mud track to the north of the study area. No other field signs of badger or protected features (i.e. setts or day nests) were recorded (Figure 7.2).

Suitable habitat for this species is present throughout the Site.

Pine Marten

Signs of pine marten were searched for within the Site following guidance from O'Mahony *et al.* (2006).

Evidence of pine marten was recorded within the study area during the 2015 survey, in the form of potential scats and an incidental sighting of a pine marten crossing the track during a bat survey.

There was similar evidence of pine marten using the study area during the 2017 surveys (Figure 7.2). Two potential pine marten scats were recorded during the survey in June. An unconfirmed pine marten call was recorded in two locations during the June survey. Pine marten are known to make a shrill call during their mating season, and the timing of the survey coincided with this period. No dens were recorded during the survey.

Suitable habitat for this species is present throughout the Site.

Red Squirrel

Areas of woodland that have the potential to support red squirrel were surveyed for squirrels, following guidance from Gurnell *et al.* (2009).

Feeding signs of squirrel, in the form of predated cone cores, were recorded during the 2015 surveys, although it was not possible to determine if these were from red or grey squirrel. No protected features were recorded during the survey.

During the 2017 survey, feeding signs of squirrel were also recorded, in the form of predated cones found in two locations. It is not possible to determine species of squirrel from these field signs alone.

An incidental observation of a red squirrel was made during an ornithology survey in 2017 within the study area. The sighting confirms that red squirrel are using the habitats within the study area.

Suitable habitat for this species is present throughout the Site.

Other Species

It is not considered necessary to undertake targeted reptile surveys; however, incidental records of reptile sightings, or signs such as shed skins, and features of particular importance (i.e. potential hibernacula) were recorded.

There were two sightings of common lizard during the survey in June. The study area offers good suitability for supporting basking and hibernating reptiles, including adder.

There were also several records of common frog (*Rana temporaria*) and common toad (*Bufo bufo*) recorded during the surveys.

The presence of red fox (*Vulpes vulpes*) was also recorded within the study area, with several scats recorded.

Bats

The Site was assessed as a medium risk site in 2015 with spatial and temporal surveys carried out as per recommended guidance (Hundt, 2012).

The results of the 2015 surveys showed high risk species (*Nyctalus* species) to be using the Site. Surveys in 2017 were designed in order to collect further data on *Nyctalus* species to determine their activity rates within the Site. To achieve this, it was decided that the best approach was to substantially increase the number of static detectors deployed seasonally across the Site and to also increase their operational times.

All bats species in Scotland are European protected species under Annex IV of the Habitats Directive 92/43/EEC. All of the species recorded within the Study Area, except for Leisler's, are on the Scottish

Biodiversity List: all pipistrelle species, Daubenton's bat, Natterer's, noctule, and brown long-eared bat. Three species are UK Biodiversity Action Plan (UKBAP) species; noctule bats, brown long-eared bat, and soprano pipistrelle. Noctule, common pipistrelle and soprano pipistrelle are also recognised as priority species under the Local Biodiversity Action Plan (LBAP) for South Ayrshire (2007 - 2010) (South Ayrshire Council, 2008).

Temporal surveys in 2015 recorded for 143 nights with 9,351 bat registrations recorded equating to a BAI of 6.78 brph. In 2017 temporal surveys recorded for 1,260 nights with 30,669 registrations recorded equating to a BAI of 2.27 brph (see **Error! Reference source not found.**).

For high risk species (*Nyctalu*s species) a total number 74 registrations and a BAI of 0.05 brph were recorded for the Site in 2015; while in 2017 a total number of 1622 registrations and a BAI of 0.1 brph were recorded for the Site. During both temporal surveys in 2015 and 2017 >1 bat registrations per night (brpn) was recorded with all locations recording high risk species during certain months.

In 2015 overall BAI per hour for medium risk species (common and soprano pipistrelle species) was seen to be moderate with a total Site value of 7.08 brph. Higher activity levels were record for medium risk species in 2017 with a BAI of 11.34 brph recorded in July at location 1 and a BAI of 12.32 recorded in September for location 13. Moderate activity levels were recorded at location 9 in September with a BAI of 6.35 brph recorded.

Low numbers of *Myotis* species (Daubenton's and Natterer's) and brown long-eared bats were recorded for the Site. *Myotis* species and brown long-eared bats are at low risk for collision and also at low risk at the population level (Natural England, 2014).

Table 7.2: Temporal Survey Results 2015 and 2017 Summary

		2015		2017	
Total BAI [brph]		6.78		2.27	
***Nyctalus* spp. BAI [brph]**	noctule		0.05	0.07	0.1
	Leisler's			0.05	
	Nyctalus spp.			0.003	
Soprano pipistrelle BAI [brph]		4.26	7.08	1.7	2.1
Common pipistrelle BAI [brph]		2.39		0.4	

Fisheries

Electrofishing surveys were undertaken, following the Scottish Fisheries Coordination Centre's (SFCC) protocols, on a number of watercourses within the Duisk Water catchment near Barrhill in South Ayrshire. Eight of these sites are situated within or downstream of the proposed Development. A control site out with the Site, and not likely to be affected by the construction works was also surveyed on the Muck Water.

Both age classes of salmon and trout were recorded in the survey sites. Salmon were recorded in six out of nine sites whilst brown trout were recorded in all sites. Other fish species recorded included European eel and lamprey spp. Substrates and gravels were clean with no excessive silt present.

Biosphere Reserve

The proposed Development within the peripheral zone of a Biosphere Reserve[15] which is a non-statutory designation that aims to ensure sustainable development. The peripheral zone is referred to as the 'Transition Area' and is detailed within the Biosphere Reserve's website*, as an area "where people live and where sustainable economic and community development is being actively promoted".* The ecological assessment will take this into account by ensuring relevant effects are assessed and mitigated where required.

Method of Assessment and Reporting

The assessment of potential effects on ecological interests will be based on CIEEM (2016) guidelines and will take into account relevant national and European legislation and policy. The assessment process involves the following:

- identification of the potential effects of the proposed Development;
- accounting for potential effects in the design process as appropriate;
- consideration of the likelihood of occurrence of remaining potential effects where appropriate;
- defining the Nature Conservation Value of the important ecological features present;
- establishing the magnitude of the likely effect (both spatial and temporal);
- based on the above information, a professional judgement is made as to whether or not the resultant effect is significant with respect to the EIA Regulations;
- if a potential effect is determined to be significant and cannot be avoided through design changes, measures to mitigate or compensate for the effect are suggested where required;
- if required, opportunities for enhancement may be considered; and
- residual effects after mitigation, compensation or enhancement are considered.

Nature Conservation Value is defined on the basis of the geographic scale, and it is necessary to consider each important ecological feature's conservation status, its distribution and its population trend (species) based on available historical records.

The significance of potential effects is determined by integrating the assessments of Nature Conservation Value and Magnitude in a reasoned way.

A set of pre-defined significance criteria will be used in assessing the effects of the proposed Development. It will be established whether there would be any effects which would be sufficient to adversely affect the important ecological 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).

An assessment of cumulative effects will be undertaken following published guidance (SNH 2012). The context in which these effects are considered is heavily dependent on the ecology of the receptor assessed but in all cases will involve consideration of the cumulative effects upon the receptor extents/populations relevant to that receptor. For example, for water voles it may be appropriate to

[15] http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/

consider effects specific to individual catchments or metapopulations, should the distance between neighbouring catchments be sufficient to assume no movement of animals between them.

Potential Effects on Ecology

The assessment will concentrate on the effects of construction and operation of the proposed Development upon those ecological receptors identified during survey work and as advised by consultees. In general, effects upon the following will be assessed:

- terrestrial habitats: effects include direct (i.e. derived from land-take) and indirect (i.e. changes caused by effects to supporting systems such as groundwater or overland flow);
- aquatic habitats: effects are limited to the ecological effects of changes in water conditions through potential pollution effects. Hydrological effects are considered in Chapter 6; and
- protected species and bats: effects considered include direct (i.e. loss of life as a result of the proposed Development; loss of key habitat; displacement from key habitat; barrier effects preventing movement to/from key habitats; and general disturbance) and indirect (i.e. loss/changes of/to food resources; population fragmentation; degradation of key habitat e.g. as a result of pollution).

Approach to Mitigation

Significant effects upon ecological receptors will be avoided/minimised where possible through the conceptual design process. Good practice during construction and operation of the proposed Development would also be implemented.

Where likely significant effects on ecological receptors are identified, measures to prevent and reduce these adverse effects will be proposed.

Reporting

The following reports in form of Technical Appendices (TA) to the EIA Report will be produced:

- National Vegetation Classification (NVC) Survey Report;
- Protected Species Survey Report;
- Bat Survey Report; and
- Electrofishing Survey Report.

Consultation

The consultees below will be approached for information to inform the EIA:

- Scottish Natural Heritage (SNH);
- SAC and D&GC;
- Scottish Environment Protection Agency (SEPA);
- Stinchar River Salmon Fisheries Board; and

- Ayrshire Rivers Trust.

Matters Scoped Out

Based on the distances and the designated features at designated sites listed in Table 7.1, connectivity is considered to be unlikely. Consequently, these would likely be scoped out from the ecological impact assessment.

Once the design of the proposed Development has been finalised it is anticipated that potential effects on some species will be able to be scoped out based on the survey results, desk study and consultation.

References and Standard Guidance

The following legislation, policy and guidance will be considered as part of the assessment:

Legislation and Policy

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna ("Habitats Directive");
- Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy ("Water Framework Directive");
- Environmental Impact Assessment Directive 85/337/EEC (as amended by 97/11/EC and 2003/35/EC);
- The Water Environment and Water Services (Scotland) Act 2003 (WEWS);
- The Wildlife and Countryside Act 1981 (as amended);
- Nature Conservation (Scotland) Act 2004 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011;
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000;
- The Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999;
- The Protection of Badgers Act 1992 (as amended);
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (the Habitats Regulations);
- Policy Advice Note PAN 1/2013 - Environmental Impact Assessment (Scottish Government 2013); and
- Planning Circular 3 2011.

Guidance

- CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition;

- European Commission (27 October 2010) Natura 2000 Guidance Document 'Wind Energy Developments and Natura 2000'. European Commission, Brussels.
- SERAD (Scottish Executive Rural Affairs Department) (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 the Conservation of Wild Birds ('The Habitats and Birds Directives'). Revised Guidance Updating Scottish Office Circular No 6/1995;
- The Scottish Biodiversity List (http://www.biodiversityscotland.gov.uk).
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- Natural England (2014) Natural England Technical Information Note TIN 051. Bats and Onshore Wind turbines – Interim Guidance, Edition 3;
- SEPA (2014): Guidance Note 4 - Planning Advice on Windfarm Developments. Version 7;
- SEPA (2014): Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems;
- Scottish Natural Heritage (2013) Planning for Development: What to consider and include in Habitat Management Plans; and
- Scottish Renewables, SNH, SEPA, FC (Scotland) (2013, Version 2) Good Practice During Windfarm Construction.

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QUESTIONS

Q10: Do consultees agree that the range of surveys carried out to date is sufficient and appropriate?

Q11: Confirmation of the approach to the ecological assessments is requested. Do consultees believe that there are further species or designated sites which need to be considered in the assessment?

Q12: Are there any other relevant consultees who should be contacted with respect to the ecology assessment?

8. ORNITHOLOGY

Introduction

This section details the proposed approach to the evaluation of bird interest on the proposed Development and surrounding area, and the assessment of potential effects.

This Section of the Scoping Report has been prepared by Natural Research (Projects) Limited (NRP), who are responsible for the ornithology surveys and assessment of potential effects and will prepare the EIA Report chapter on Ornithology.

Environmental Baseline and Potential Sources of Impact

Baseline Conditions

Designated Sites

The proposed Development is not designated internationally or nationally for bird interests. The nearest Special Protection Area (SPA) is the Glen App and Galloway Moors SPA (approximately 3.2km at its nearest point) which is designated for breeding hen harrier.

Field Survey Methods

Surveys of the proposed Development and surrounding area have commenced and are due to end in March 2019. Three breeding seasons and two non-breeding seasons will be completed following SNH guidance (SNH 2013), with the objective to survey breeding and wintering birds within prescribed buffers of the proposed Development and to quantify flight activity.

Due to alterations in the area of interest, survey effort and coverage has varied between years. Surveys relevant to the proposed Development commenced in January 2014 and ended in December 2014. They then recommenced for a slightly altered area of interest for the period between April 2017 and August 2017 and finally recommenced for this area in April 2018 to finish in March 2019. This will provide data for three bird breeding periods and two non-breeding periods. In addition some results of survey work which was completed between April 2012 and March 2014 will be used in the EIA Report to provide context.

The survey areas used encompass the area of interest plus a buffer appropriate to the species under consideration (Figure 8.1). Survey results will be tailored to the relevant buffers around the layout to allow an assessment consistent with the proposed Development.

The following surveys were undertaken:

- generic flight activity (vantage point watches);
- migration period flight activity;
- scarce breeding birds;
- breeding birds of open ground areas;
- black grouse;
- autumn / winter walkovers; and

- non-breeding period roosts of hen harrier.

Surveys were undertaken by experienced field ornithologists, under licence from SNH (where required). Full details of the survey effort, weather conditions and methods will be presented in the Environmental Statement (ES).

Flight Activity – Generic Vantage Point Watches

Flight activity within the vicinity of the proposed Development will be quantified for the EIA Report in order to identify areas of greatest importance to birds and generate quantitative data on activity levels to inform an assessment of collision risk if required. The methods given in Band et al (2007) will be used.

Eleven Generic Vantage Points (GVPs) have been used in VP survey effort to date. For the area of interest identified in 2014 seven were established. These were located with the aim of maximising ground visibility within a 500m survey boundary using the minimum number of points. GVPs were selected through a mix of Geographical Information System (GIS) analysis and field trials. Visibility was modelled at 20m elevation with a 2km cut-off (Figure 8.2). Three of these GVPs were then continued to cover the second area of interest from 2017 to date, with a substitution of four new GVPs as these were found to cover the revised area better.

A minimum of 36 hours of observation will have been completed from each GVP for each period of each year (April to August classed as the breeding period and September to March classed as the non-breeding period). In 2014, for each GVP, 40 hours were completed in January to March and September to December, and 39 hours between April to August. In 2017, 36 hours were completed between April and August, and 36 hours are proposed for between April and August 2018 and 36 hours between September 2018 and March 2019 (Table 8-.1a, b and c.

Table 8.1a: Survey Effort from Generic Vantage Points for 2014

GVP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	5.00	5.50	7.00	7.50	8.00	8.00	8.00	7.50	7.50	5.50	5.00	4.50
5	5.00	5.50	7.00	7.50	8.00	8.00	8.00	7.50	7.50	5.50	5.00	4.50
6	5.00	5.50	7.00	7.50	8.00	8.00	8.00	7.50	7.50	5.50	5.00	4.50
7	5.00	5.50	7.00	7.50	8.00	8.00	8.00	7.50	7.50	5.50	5.00	4.50
8	5.00	5.50	7.00	7.50	8.00	8.00	8.00	7.50	7.50	5.50	5.00	4.50
9	5.00	5.50	7.00	7.50	8.00	8.00	8.00	7.50	7.50	5.50	5.00	4.50
10	5.00	5.50	7.00	7.50	8.00	8.00	8.00	7.50	7.50	5.50	5.00	4.50

Table 8.1b Survey Effort from generic vantage points for 2017

GVP	Apr	May	Jun	Jul	Aug
5	8.00	8.00	8.00	8.00	4.00
8	8.00	8.00	8.00	8.00	4.00
9	8.00	8.00	8.00	8.00	4.00
15	8.00	8.00	8.00	8.00	4.00
16	8.00	8.00	8.00	8.00	4.00
17	8.00	8.00	8.00	8.00	4.00
18	8.00	8.00	8.00	8.00	4.00

Table 8.1c Survey effort from generic vantage points for 2018/2019 (figures in italics are still to be completed)

GVP	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
5	6.00	12.00	3.00	9.00	6.00	*6.00*	*6.00*	*5.00*	*4.00*	*4.00*	*5.00*	*6.00*
8	2.00	15.00	0.00	13.00	6.00	*6.00*	*6.00*	*5.00*	*4.00*	*4.00*	*5.00*	*6.00*
9	6.00	12.00	6.00	6.00	6.00	*6.00*	*6.00*	*5.00*	*4.00*	*4.00*	*5.00*	*6.00*
15	6.00	12.00	6.00	6.00	6.00	*6.00*	*6.00*	*5.00*	*4.00*	*4.00*	*5.00*	*6.00*
16	6.00	12.00	6.00	6.00	6.00	*6.00*	*6.00*	*5.00*	*4.00*	*4.00*	*5.00*	*6.00*
17	6.00	12.00	6.00	6.00	6.00	*6.00*	*6.00*	*5.00*	*4.00*	*4.00*	*5.00*	*6.00*
18	6.00	12.00	3.00	9.00	6.00	*6.00*	*6.00*	*5.00*	*4.00*	*4.00*	*5.00*	*6.00*

Observers position themselves to minimise their effects on bird behaviour and a viewing arc not exceeding 180 degrees is scanned. Watches are undertaken during daylight hours by a single observer in a range of weather conditions, excepting poor ground visibility and are spread temporally to include a representative number of hours early and late in the day.

During each watch, three hierarchical recording methods are used: once a focal species (a species considered to be of high conservation importance) is detected the bird is followed until it ceases flying or is lost to view. The duration is noted and the bird's flying elevation above ground estimated at the point of detection and at 15 second intervals thereafter; other focal species (such as geese and wader species) are not timed but their flight paths are mapped and elevation recorded at the start and when it changes during the flight bout; finally a count of species of lower conservation importance is summarised for each 5 minute period of the watch.

Flight Activity – Migratory Period Watches

Additional watches to record migratory movements of swans, geese and waders at a landscape scale were completed during 2014. Two Migration Watch Points (MWPs) were identified which gave good broad spatial coverage of the site in respect of birds moving on a predominantly north-south axis. One was used for 36 hours between March and April 2014 (spring) and the other for 36 hours between September and November 2014 (autumn). A range of weather conditions were sampled.

Scarce Breeding Birds

Surveys were carried out during the breeding periods within a 2km survey boundary surrounding the proposed Development. Extreme care was taken to avoid unnecessary disturbance to breeding birds. Methods followed those described in Hardey *et al*. (2013) and Gilbert *et al*. (1998) and priority was given to species considered most likely to occur. Surveys were completed for hen harrier, peregrine, merlin, short-eared owl, goshawk and nightjar. Contact with the Dumfries & Galloway Raptor Study Group was maintained.

Breeding Birds of Open Ground Areas

The distribution of territories of selected species of conservation concern breeding in the open ground areas contained with the 500m survey boundaries were mapped in 2014 and 2017. Surveys were completed using the modified Brown and Shepherd (1993) methodology for upland waders.

All suitable areas within the survey boundary were visited on four occasions during spring/early summer. Surveys were undertaken in conditions considered suitable for bird detection, avoiding strong winds, persistent precipitation, poor visibility, or unusually hot or cold days. The survey aimed to cover the ground systematically with a constant search effort. The positions of birds were mapped and a summary map compiled to show the location of each identified territory.

Black Grouse

Black grouse are not currently known to be in the survey area however there are records from areas nearby in the region, and suitable habitat exists within the relevant (1.5km) survey buffer. Therefore checks for displaying (lekking) males were carried out during the springs of 2014, 2017 and 2018.

Two visits were undertaken (in April and in May) to all areas identified as potentially suitable for holding displaying males. Visits were made on calm, dry days with good visibility, within three hours of sunrise. Observers listened and scanned carefully for displaying males from suitable locations.

Autumn / Winter Walkovers

These surveys are designed to complement the surveys of breeding birds undertaken during the spring and summer, and occurred within the 500m survey buffer. Walk routes aimed to examine as much ground as practical. Where practicable observers used a different route on each visit to maximise spatial coverage of the site: location, time of detection, species, count and, for some species flight routes were recorded and mapped.

Non-breeding Roosts of Hen Harrier

Watches of known and potentially suitable areas for overwinter roosts of hen harrier which lie within the 2km survey buffer were completed in the winters of 2014, 2015 and 2016 and are scheduled for 2018/2019 non-breeding period.

These watches are carried out from a suitable vantage point for approximately 2 hours at dusk or dawn. The aim is to attempt to observe the birds entering or leaving the roost area respectively and to estimate a count of birds using it.

Potential Sources of Impact

Potential effects on birds associated with the construction and / or operation of the proposed Development include:

- a short-term reduction in breeding or wintering bird populations due to construction disturbance;
- a permanent reduction in breeding or wintering bird populations due to loss of habitat critical for nesting, roosting or feeding;
- a permanent reduction in breeding or wintering populations due to the loss of individuals through collision with the turbines; and
- cumulative effects with other nearby development proposals that are operational during the same period, and/or with other developments which pose either a potential collision risk or loss of habitat.

Method of Assessment and Reporting

Baseline

The results of the surveys along with consultations and desk studies will be used to illustrate the current baseline of the proposed Development.

Assessment of Effects

In assessing whether an effect is significant or not, three factors will be considered:

- the Nature Conservation Importance (NCI) of the species involved;
- the magnitude of the likely effects; and
- the conservation status of the species

Determining Significance

Following the classification of each species' NCI and consideration of each effect, professional judgement will be used to make a reasoned argument of the likely effect on the conservation status of each potentially affected species. In accordance with the EIA Regulations, each likely effect will be evaluated and classified as either significant or not significant, in the context of the status of, and trends within, regional populations as defined by SNH Natural Heritage Zones (NHZs).

Mitigation

If any effects are deemed to be significant, necessary measures to mitigate the effects will be presented.

Cumulative Assessment

A cumulative assessment will consider development proposals within the relevant NHZ that are operational during the same period, and/or with other developments which pose either a potential collision risk or loss of habitat.

Consultation

SNH, the Royal Society for the Protection of Birds (RSPB) and Dumfries and Galloway Raptor Study Group will be consulted during the survey period.

SNH have already provided advice on the suitability of data previously collected (email from G. Walker June 2017).

Matters Scoped Out

As surveys are ongoing no matters have been scoped out as yet. However it would be hoped that potential effects on the majority of bird species will be able to be scoped out based on the survey results, desk study and consultation.

References and Standard Guidance

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

- The Environmental Impact Assessment Directive 85/337/EEC (as amended by 97/11/EC and 2003/35/EC);
- 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
- European Commission (27 October 2010) Natura 2000 Guidance Document *'Wind Energy Developments and Natura 2000'*. European Commission, Brussels.

The following national legislation, policy and guidance will be considered as part of the assessment:

- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000;
- The Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999;
- The Wildlife and Countryside Act 1981 (as amended);
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (The Habitats Regulations);
- The UK Biodiversity Action Plan (BAP) and UK Post-2010 Biodiversity Framework;
- Eaton *et al.* (2015). *Birds of Conservation Concern 4*;

- CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition*;
- Scottish Natural Heritage (2000) *Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action*. SNH Guidance Note;
- Scottish Natural Heritage (2006) *Assessing significance of impacts from onshore windfarms on birds outwith designated areas*;
- Scottish Natural Heritage (2009) *Environmental Statements and Annexes of Environmentally Sensitive Bird Information; Guidance for Developers, Consultants and Consultees*;
- Scottish Natural Heritage (2012). *Assessing the Cumulative Impact of Onshore Wind Energy* Developments;
- Scottish Natural Heritage (July 2013) *Assessing connectivity with Special Protection Areas*; and
- Scottish Natural Heritage (2014) *Recommended bird survey methods to inform impact assessment of onshore wind farms*.

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Pendlebury, C., Zisman, S., Walls, R., Sweeney, J., McLoughlin, E., Robinson, C., Turner, L. & Loughrey, J. (2011*). Literature review to assess bird species connectivity to Special Protection Areas*. Scottish Natural Heritage Commissioned Report No. 390. SNH, Battleby.

SNH Guidance (2006): *Assessing significance of impacts from onshore windfarms on birds outwith designated areas.* SNH, Battleby*.*

SNH Guidance (2012): *Regional population estimates of selected Scottish breeding birds* SNH, Battleby

SNH Guidance (2012): *Assessing the cumulative impact of onshore wind energy developments* SNH, Battleby

SNH Guidance (2013, updated 2014): *Recommended bird survey methods to inform impact assessment of onshore windfarm.* SNH Battleby

SNH Guidance (2017): A*voidance rates for the Onshore SNH wind farm collision risk model.* SNH, Battleby

QUESTIONS

Q13: Do consultees agree that the range of surveys carried out to date is sufficient and appropriate?

9. HYDROLOGY, HYDROGEOLOGY, GEOLOGY AND SOILS

Introduction

This Section of the report sets out the proposed approach to the assessment of the potential effects of the proposed Development on the water environment (which includes hydrology and hydrogeology) and soils and geology (which includes an assessment of the distribution and thickness of peat at site) during the construction and operation of the windfarm.

This Section of the Scoping Report has been prepared by SLR Consulting Ltd., who will also undertake the assessment of effects on soils, geology and the water environment for the EIA.

Environmental Baseline and Potential Sources of Impact

Baseline Conditions

Much is known about the local hydrology and ground conditions because of the investigation, assessment and construction completed at Arecleoch Windfarm.

Like the existing windfarm, the proposed Site is shown by British Geological Survey (BGS) to be underlain by peat and glacial till. Beneath the superficial deposits, bedrock beneath most of the Site comprises the Kirkholm and Dalreoch Formations (both fine grained sedimentary wackes).

The peat underlying the Site has been extensively modified by forestry; only a small portion of the Site, located in the north eastern corner, is classified as a priority peatland habitat. This priority habitat will not be considered as part of the developable area and can therefore be scoped out from further consideration.

Published mapping confirms there is no underground or surface opencast mining. Except for small forestry borrow pits used for track construction there are no mining or quarrying activities present on Site.

The bedrock deposits are classified as low productivity aquifers which would be expected to contain little groundwater. Limited groundwater may be present in the near surface weathered zone and in secondary fractures.

The Scottish Environment Protection Agency (SEPA) River Basin Management Plan (http://gis.sepa.org.uk/rbmp/) shows the Site lies within a Drinking Water Protection Zone associated with the Newton Stewart bedrock and localised sand and gravel aquifers.

The Water of Tig and Cross Water and their tributaries rise within the Site and flow to the River Stinchar. The River Stinchar is a high value watercourse and is a Fresh Water Fish Directive Salmonid Water which is managed by the River Stinchar District Salmon Fishery Board.

Natural drainage paths at Site have been modified by the development of commercial forestry. In 2016 SEPA classified the Overall Status for Water of Tig and Cross Water as Good.

SEPA mapping confirms flood extents associated with the larger watercourses are confined to the watercourse corridors, and floodplain extents are not extensive.

Two sites of Special Scientific Interest (SSSI) are recorded in hydraulic continuity with the Site, these are:

- Craig Wood, on the northern banks of the Water of Tig, 1.52km downstream of the Site. Craig Wood SSSI is an oak woodland; and

- Ballantrae shingle beach is 16km downstream of the Site located at the mouth of the River Stinchar, at Ballantrae. It is a saltmarsh and shingle feature.

Potential Sources of Impact

A summary of the potential effects on ground conditions and the water environment resulting from construction, and operation of a windfarm is provided below. These will be considered in the EIA Report.

Potential Impacts during Construction

The impacts that will be considered in the EIA are:

- disturbance and loss of deposits of peat;
- disturbance of any residual ground contamination which might be associated with historic land use (such as forestry);
- ground instability (inc. peat slide risk);
- impacts on surface water and groundwater quality from pollution from fuel, oil, concrete or other hazardous substances;
- discharge of sediment-laden runoff to drainage system and watercourses;
- increased flood risk to areas downstream of the Site during construction through increased surface run-off;
- changes in groundwater levels from dewatering excavations;
- potential change of groundwater flow paths and contribution to areas of peat and groundwater dependent terrestrial ecosystems (GWDTEs);
- disturbance of watercourse bed and banks from the construction of culverts;
- potential pollution impacts to public and private water supplies; and
- Potential blockage of existing forestry drainage channels or culverts during forestry clearance or construction activities.

Potential Impacts during Operation

The impacts that will be considered in the EIA are:

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

- pollution impacts on surface water quality from maintenance work.

Method of Assessment and Reporting

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

Desk Study

An initial desk study will be undertaken to determine and confirm the baseline characteristics by reviewing available information relating to soils, geology, hydrology, and hydrogeology such as groundwater resources, licensed and unlicensed groundwater and surface water abstractions, public and private water supplies, surface water flows, flooding, rainfall data, water quality and soil data. This will include review of published geological maps, OS maps, aerial photographs and Site-specific data such as site investigation data, geological and hydrogeological reports, digital terrain models (slope plans) and geological literature.

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

Field Surveys

The SLR hydrological assessment specialists will liaise closely with the project ecologists (MacArthur Green) and geology/geotechnical specialists (SLR) to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed.

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

- verify the information collected during the desk and baseline study;
- undertake a visual assessment of the main surface waters and identify private water supplies, including their intakes;
- identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;
- visit any identified GWDTEs (in consultation with the project ecologists);
- prepare a schedule of potential watercourse crossings;
- inspect rock exposures, establish by probing an estimate overburden thicknesses (a probe is pushed vertically into the ground to refusal and the depth is recorded);
- confirm underlying substrate, based on the type of refusal of the probe (solid and abrupt refusal-rock, solid but less abrupt refusal with grinding or crunching sound-sand or gravel, rapid and firm refusal-clay, gradual refusal-dense peat or soft clay);
- allow appreciation of the Site, determining gradients, possible borrow pits, access routes, ground conditions, etc., and to assess the relative location of all the components of the proposed Development;

- complete a probing exercise using a 100m grid that will identify areas of thick peat that will help to inform the design of the proposed Development (by inserting a probe into the ground and pushing into the peat to refusal then the depth is recorded); and
- confirm the distribution and depth of peat across areas of the Site being considered for development only.

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

The peat probing completed as part of the initial field surveys will be developed further as part of the as part of the assessment of effects. The following works will be completed:

- peat depths within the proposed turbine area will be obtained using a 50m grid where access is possible (the probing will also provide information of the substrate below the peat);
- a limited (in terms of aerial extent) geomorphological mapping exercise will be undertaken to link the topographic features with the underlying geology and to visit those areas of the Site that may be identified as potentially 'at risk from peat slide';
- the thickness of the peat will be established by probing and the underlying sub-strata confirmed by inspection of watercourses
- the investigation will look at turbine locations, access routes and borrow pits for signs of existing or potential peat instability
- output from the field survey will comprise a record of investigation locations and summary of peat depths recorded

Once the design layout has been finalised SLR Consulting will return to the site and peat probe along the infrastructure (including within the forestry) at 50 m centres and undertake 10 m crosshair probing at turbine locations.

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

Mitigation

Given both SPR's commitment to, and prior experience of, implementing accepted good practice during construction and operation, and the current regulatory context, any potential effects on soils, geology and the water environment identified by the assessment will be addressed and mitigated by the conceptual site design and the application of best practice guidance to prevent, reduce or offset effects.

As a consequence, a number of measures are not considered to be mitigation as such, but rather an integral part of the design/construction process; and it is proposed that these will be taken into account prior to assessing the likely effects of the proposed Development. However, where appropriate, more tailored mitigation measures will be identified prior to determining the likely significance of residual effects. Specific measures will also be detailed within the Draft Construction Environmental Management Plan (CEMP) and will include as a minimum:

- Adoption of best practice pollution prevention, drainage control and waste management procedures;

- Control of drainage and sediment runoff from excavation areas and access tracks;
- Control of drainage and sediment runoff during the construction of watercourse crossings;
- Control of concrete pouring; and
- Appropriate design of foundation installation, taking into account the presence of peat across the site, the management of soil water levels and the potential to generate excessive quantities of groundwater contaminated sediments.

Drainage control will involve treatment and discharge of water into surrounding vegetation and siltation ponds so that no increase in runoff to surrounding watercourses is experienced. These measures will reflect current best practice in the industry and will serve to prevent an increase in flood risk or decrease in downstream water quality. Consideration will also be given to discharges to areas of peat so as not to increase peat slide risk or change peat hydrology. Standard construction practices adopted on windfarm developments will be assessed, and modified where necessary, to ensure that predicted effects are able to be controlled. Guidance on the protection of the water environment including relevant SEPA and CIRIA guidance will also be used to assist with the development mitigation.

Assessment of Effects

The purpose of this assessment will be to:

- identify any areas susceptible to peat slide, using peat thickness and Digital Terrain Model (DTM) data to analyse slopes;
- assist in the design and micrositing of turbines and tracks into areas of shallower or no peat;
- assess potential effects on soils, peat and geology;
- determine what the likely effects of the proposed Development are on the hydrological regime, including water quality, flow and drainage;
- allow an assessment of potential effects on identified licensed and private water supplies;
- assess potential effects on water (including groundwater) dependent habitats;
- determine suitable mitigation measures to prevent significant hydrological and hydrogeological effects;
- assist in the design and micrositing of turbines in the least hydrogeologically and hydrologically sensitive areas by applying buffer zones around watercourses and other hydrological features; and
- develop an acceptable code for working on the Site that will adopt best practice procedures, effective management and control of on Site activities to reduce or offset any detrimental effects on the geological, hydrogeological and hydrological environment.

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

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

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

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

The assessment will consider potential cumulative effects associated with other windfarm developments within 5km of the site and within the same surface water catchments.

Technical Reports / Appendices to the EIA Report

Peat Management Plan & Peat Landslide Hazard and Risk Assessment

A draft Peat Management Plan will be prepared as a supporting technical appendix in line with the SEPA Regulatory Position Statement: Developments on Peat (2012). The Waste Framework Directive (WFD) 2008/98/EC, transposed into National Law under The Waste Management Licensing (Scotland) Regulations 2011, sets out a requirement to apply a waste hierarchy. In terms of this project, this hierarchy should be considered as follows:

- prevent excavation;
- reduce volumes of peat excavated; and
- reuse excavated peat in a manner to which it is suited.

If significant peat deposits are proven, a Peat Landslide Hazard and Risk Assessment will be completed using the Site survey data and slope analysis (using DTM data), highlighting areas that may be impacted by a peat slide so that appropriate mitigation measures and can be identified.

Borrow Pit Assessment

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

Consultation

As part of the consultation phase of the project environmental data and views of the proposed Development will be sought from:

- AM Geomorphology (Peat)
- SEPA;
- Scottish Natural Heritage (SNH),
- River Stinchar District Salmon Fishery Board;
- SAC; and
- D&GC.

Matters Scoped Out

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

- *Detailed Flood Risk Assessment*. Published mapping confirms that most of the Site is not located in an area identified as being at flood risk. It is proposed, therefore, that a simple screening of potential flooding sources (fluvial, coastal, groundwater, infrastructure etc.) is presented in the EIA Report and measures that would be used to control the rate and quality of runoff will be specified in the CEMP.
- *Water Quality Monitoring*. Classification data is available from SEPA for the watercourses at Site and, other than forestry, there are no known sources of potential water pollution at Site that might give rise for the need for water quality monitoring as part of the EIA Report. Water quality monitoring may be required and undertaken prior to, during and post construction if the project were to be granted planning permission.
- *Detailed Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment*. As the Site is currently used for commercial forestry it is not expected that a standalone or detailed GWDTE assessment will be required or warranted. National Vegetation Classification (NVC) data will be used to assess for potential areas of GWDTE, but at this stage no detailed assessment is expected.
- *Priority 1 Peat Habitat*. The extent of the priority Peatland habitat identified on Site is located in the north eastern corner of the Site and as a consequence of its sensitivity and in conjunction with a number of other constraints will not be considered as part of the developable area.

References and Standard Guidance

The soils, geology and water environment Chapter will be prepared with reference to best practice guidance and legislation, including the following key references:

Geology, Peat and Soils

- SEPA Regulatory Position Statement, Developments on Peat, Scottish Environment Protection Agency, 2012.
- Good Practice during Windfarm Construction, Ver1, a joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland and Historic Environment Scotland, Version 3, September 2015.
- 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 (FCS), Scottish Natural Heritage (SNH), 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, 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.

Hydrology and Hydrogeology

- EC Water Framework Directive (2000/60/EC).
- Scottish Planning Policy (SPP), Scottish Executive, June 2014.
- Water Environment and Water Services (Scotland) Act 2003.
- Water Environment (Controlled Activities) Regulations 2011.
- 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.
- Good Practice during Windfarm Construction, Ver1, a joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland and Historic Environment Scotland, Version 3, September 2015.
- The SuDS Manual C753, CIRIA, 2015.
- Environmental Good Practice on Site C692, CIRIA, 2010.

QUESTIONS

Q14: Is the spatial extent of the study area considered to be appropriate?

Q15: Are the survey methods for assessing likely effects on hydrology, hydrogeology, geology and peat considered to be suitable?

Q16: Are there any other relevant consultees who should be contacted with respect to the soils, geology and water environment assessment?

10. ARCHAEOLOGY AND CULTURAL HERITAGE

Introduction

The 'cultural heritage' of an area comprises archaeological sites, historic buildings, GDL's, historic battlefields and other historic environment features. It also includes features or places in the landscape that have the capacity to provide information about past human activity, or 'intangible' aspects which have cultural significance due to associations with, for example, literary or artistic works, folklore or historic events. The 'setting' of an asset within the wider landscape may contribute to its cultural heritage significance.

The cultural heritage impact assessment will identify cultural heritage assets that may be subject to significant effects, both within the Site and within 5km of the proposed turbines. It will establish the potential for currently unknown archaeological assets that lie within the Site, assess the predicted effects on these assets, and propose a programme of mitigation where appropriate. It will consider direct effects (such as physical disturbance), indirect effects (such as caused by change within the settings of assets), and cumulative effects (where changes to an asset setting which would result from the proposed Development are also affected by other developments).

This Section of the Scoping Report has been prepared by SLR Consulting Ltd., who will undertake the cultural heritage assessment for the EIA.

Environmental Baseline and Potential Sources of Impact

Cultural heritage assets are a finite and non-renewable resource. Direct physical impacts on assets are permanent and irreversible. Some indirect setting impacts are reversible: for example turbines may be removed when a windfarm is decommissioned. Scottish Government policy states that *"actions taken in respect of Scotland's historic environment should secure its conservation and management for the benefit and enjoyment of present and future generations"*.

Baseline Conditions

There are no designated heritage assets within the Site.

Within 5km of the Site there are 23 scheduled monuments (Figure 2.2), including a concentration of 14 prehistoric sites in the area of Corly Craig, including hut circles, field systems, cairns, a chambered cairn and a burnt mound. There are a few other prehistoric scheduled monuments within this area, including standing stones and other chambered cairns. Scheduled monuments dating from historic periods include three castles to the north west of the proposed Development, a church and graveyard and a crannog.

There are 23 listed buildings within 5km of the redline boundary (Figure 2.2), one of which is a category A listing, Kildonan House near Barrhill. There are 10 category B listed buildings, mostly scattered around the north of the proposed Development, with three in or near the conservation area at Colmonell.

Within the Site there are at least 27 non-designated heritage assets. Many of these assets relate to the post-medieval agricultural landscape, including sheepfolds, field systems and buildings. There are also a number of assets of prehistoric date including a possible cup marked stone, a long cairn, a standing stone and a hut circle.

Potential Sources of Impact

Potential effects on cultural heritage associated with the construction and/or operation of the proposed Development include:

- direct effects through partial or total removal during ground breaking operations on known or currently undiscovered buried remains of archaeological interest;
- indirect effects on the settings of cultural heritage assets including those resulting from intervisibility between an asset and the proposed Development; and
- cumulative effects on settings of cultural heritage assets with other existing or proposed Developments.

Method of Assessment and Reporting

Study Area

There is no guidance from HES which defines a required study area for the archaeological and cultural heritage assessment of windfarms. Two study areas are proposed:

- an Inner Study Area which would comprise land within the Site and an area buffer zone 250m from the Site boundary; and
- an Outer Study Area of land beyond the Inner Study Area and up to 5km distance from the proposed turbines, with theoretical intervisibility with the proposed turbines.

Inner Study Area

All known heritage assets will be assessed for their significance and potential to be affected by direct impacts from construction. The recorded historic environment within, and up to 250m beyond the Site, will be analysed to inform a predictive model of the probability for potential unknown buried archaeological remains to exist which might be directly affected by construction within the Inner Study Area. All regionally and nationally important heritage assets within the Inner Study Area will be considered for operational impacts upon their setting. Heritage assets of regional importance are understood to be: Category B Listed Buildings and Conservation Areas. Nationally important assets defined below.

Outer Study Area

All nationally important designated heritage assets within the Outer Study Area will be considered for operational impacts upon their setting. Nationally important heritage assets include: World Heritage Sites; Scheduled Monuments; Category A Listed Buildings; GDLs; and Designated Battlefields. This assessment will take into account particular sensitivity to long-distance visual impact, such as designed views, prospect towers and hill-top Sites.

Desk Study

The desk study will provide a synthesis of the historic environment based on layering of the data into a GIS and sorting information into chronological periods. This approach will identify any cultural heritage issues within the study areas using the following sources:

- consultation with the West of Scotland Archaeology Service (WoSAS) Historic Environment Record (HER) for the Inner and Outer Study Areas, for Site-specific information;
- consultation with Historic Environment Scotland (HES) as appropriate for designated assets;
- consultation of web-based facilities for other information;
- map regression using historic mapping sources to identify changes and development of the historic landscape;
- review of available Historic Landscape Characterisation for the Inner Study Areas;
- a review of aerial photographs of the Inner Study Area (National Collection of Aerial Photography, Edinburgh);
- review of any appropriate geotechnical data including peat probing and sampling data;
- relevant heritage assessments for nearby developments, particularly the ES for Arecleoch Windfarm;
- synthesis of published sources to establish historic landscape and archaeological context and any cultural heritage associations, including data from Canmore (the HES database); and
- on-line data on designated assets including scheduled monuments, listed buildings and gardens and designed landscapes.

Field Surveys

A targeted Site inspection will be carried out of the location of the recorded assets likely to be impacted by the proposed Development, and the readily accessible elements of the proposed infrastructure to establish the condition of recorded assets and identify the potential for the existence of additional assets not currently identified.

Inspections to assess settings will be made after comparison of mapped assets to ZTV data and aerial imagery to ensure that greatest potential effects are assessed. This would be followed by a detailed analysis of those Sites identified as potentially sensitive to impacts from setting change, including targeted field inspection.

The results of the desk study and the Site visit will be analysed in GIS and presented in an illustrated synthetic report, setting out the evidence for the development of the historic environment around the proposed Development.

Mitigation

Analysis of GIS layered data about the historic environment will be provided to the design team to assist with avoiding or minimising both direct and indirect effects on heritage assets.

Where adverse effects on cultural heritage are identified, measures to prevent, reduce and/or where possible offset will be proposed. Measures which may be adopted include:

- the micro-siting of proposed Development components away from sensitive locations;
- the fencing off or marking out of cultural heritage assets in proximity to working areas in order to ensure avoidance of disturbance;

- a programme of archaeological work where required, such as an archaeological watching brief during construction activities in or in proximity to areas of particular concern, or excavation and recording where damage is unavoidable; and
- a working protocol to be implemented should unrecorded archaeological features be discovered.

Assessment of Heritage Significance and the Contribution of Setting

The EIA Report will establish the heritage significance of the assets likely to be affected by the proposed Development. Criteria such as period, topographic location, function, design, conceptual frameworks, and group and community value would be employed to understand the heritage significance of the assets, and this would then be applied to identify the key contributions of setting to that heritage significance.

Assessment of Effects

The EIA will consider the potential direct effects from construction within the Site on known heritage assets and on potential unknown buried archaeological remains. It will also assess the potential indirect effects including those resulting from visual effect on the settings of statutorily designated historic assets of regional or national importance within the study areas as described previously in this Section. The assessment will detail whether effects upon heritage assets are considered temporary, short term, long term or permanent, and as to whether they would occur during construction and operation of the proposed Development.

The relevant aspects of parallel studies would be incorporated into the cultural heritage assessment, through liaison with the other specialist technical disciplines during the assessment process, and cross-referencing in the resulting EIA chapters, notably the Landscape and Visual Impact Assessment (Section 6).

Residual and Cumulative Effects

A residual impact assessment would identify the significance of effect of the proposed Development on the historic environment taking into account the mitigation strategy.

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

- an above negligible effect on an asset or group of assets due to changes which would be caused by the main development under assessment; and
- an effect on the same asset or groups of assets which would be caused by another development or developments.

Consideration of the other developments will be limited to:

- windfarm applications that have been submitted and have a decision pending; and
- windfarm applications which have been granted permission but not yet constructed.

Effects from operational windfarms would be included in the baseline. Cumulative effects would be addressed in two stages:

- assessment of the combined effect of the developments including the proposed Development; and

- assessment of the degree to which the proposed Development contributes to the combined effects from the other windfarm developments.

Consultation

Consultation with respect to the method of assessment employed and the cultural heritage assets will be undertaken with HES (scheduled monuments, category A listed buildings, inventorised gardens and designed landscapes), and SAC and WoSAS who provide archaeological advice to SAC and administer the South Ayrshire Historic Environment Record (HER)

Matters Scoped Out

On the basis of the work undertaken to date, the professional judgement of the cultural heritage team, and experience from other similar projects, it is considered that indirect and cumulative impacts of the proposed Development on Category C Listed Buildings can be scoped out. Scotland's Listed Buildings by Historic Scotland (2014), described Category C Listed Buildings as of local rather than national or regional importance.

References and Standard Guidance

Relevant legislation and national policy documents include:

- The Ancient Monuments and Archaeological Areas Act 1979;
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997;
- The Historic Environment (Amendment) (Scotland) Act 2011 (this includes amendments to the above);
- Planning Advice Note Planning and Archaeology PAN 2/2011;
- Scottish Planning Policy 2014 (Scottish Government 2014);
- Historic Environment Scotland Policy Statement (HESPS 2016);
- Historic Environment Circular 1, HES 2016; and
- PAN2/2011 Planning and Archaeology (Scottish Government 2011).

A number of relevant pieces of guidance have been published by the national heritage agency, HES, and the professional archaeological body, the Chartered Institute for Archaeologists (CIfA). These publications are:

- HES's 'Managing Change in the Historic Environment: Setting' (HES 2016). This document provides guidance on how to assess what constitutes the setting of historic structures or places. This is the key document available to assist in managing change;
- CIfA's 'Standard and Guidance for Historic Environment Desk Based Assessment' (CIfA 2014a), which gives best practice for the execution of desk based assessments; and
- CIfA's Code of Conduct (CIfA 2014b).

QUESTIONS

Q17: Confirmation is requested that the cultural heritage study areas are considered appropriate for the assessment.

Q18: Are there any other relevant consultees who should be contacted with respect to the cultural heritage assessment?

11. ACCESS, TRAFFIC AND TRANSPORT

This section considers the scope of work required to assess potential significant effects associated with access, traffic and transport during the construction and operational phases of the proposed Development. The previous EIA Transport Chapters prepared to support the application for the Kilgallioch and Arecleoch Windfarms, submitted in 2006 and 2010 respectively, have been reviewed to inform the scope of the transport assessment.

Environmental Baseline and Potential Sources of Impact

Access to the Site would be via an existing entrance at Wheeb Bridge on the A714, via an existing entrance at Bents Farm and from the unclassified Barrhill to Glen Luce road. The access track and bell mouth junction on the A714 close to Wheeb bridge, approximately 7km south east of Barrhill, is to be used as the main entrance for turbine deliveries and the majority of the construction traffic.

The assessment is required to evaluate the effects of the proposed Development and to determine the scale of the impacts on the identified sensitive receptors. The main sensitive receptors to increased traffic levels and environmental impacts are anticipated to be located along the A714 between Girvan and Newton Stewart, with residential properties and sensitive non-residential properties such as schools considered. This assessment will not consider the impacts associated with the transportation of turbine components as the routes are considered to be relevant and suitable for the proposed Development.

Consultation will be undertaken with the local community with respect of traffic management proposals. The scope of the study and assessment for the proposed Development in relation to access, traffic and transport will seek to identify potential issues which may result from the construction of the proposed Development.

Baseline Conditions

All abnormal indivisible loads (AILs) would travel along the A714 to the main Site access at Wheeb Bridge from Newton Stewart. The proposed route has been used for turbine delivery for Arecleoch and Kilgallioch and has been proven to be capable of turbine deliveries. The study area will be defined as:

- A714 south from Wheeb Bridge access to Newton Stewart and the roundabout junction with the A75;
- A714 north from Wheeb Bridge to the access at Bents Farm; and
- A714 north of the access at Bents Farm to the roundabout junction with the A77.

Traffic survey data has been obtained so that existing traffic flows and vehicle types using the key routes can be understood. An ATC survey was commissioned on the A714, south of the Site access point at Wheeb Bridge and also south of the access at Bents Farm. A 12 hour turning count has also been completed at the junction of Gowlands Terrace and Main Street.

Injury accident data for the roads within the study area will be obtained to ensure any road safety issues are identified.

Potential Sources of Impact

The potential sources of impact have been divided into the two development phases: construction and operation. The impacts associated with each of these phases are discussed in further detail below. In

summary the main potential sources of impact are likely to relate to the impact of construction traffic on the residential properties and areas along the network route.

Construction Phase

The construction phase of the proposed Development is likely to create the greatest environmental impact however the proposed extension is expected to have fewer impacts than the operational Arecleoch site (60 turbines) and the nearby Kilgallioch Windfarm (96 turbines) which both used the same delivery and access routes. This is due to the reduced number of HGVs and light goods vehicles (LGVs) required to transport the materials onto Site (this site will likely be around 15 turbines, compared with 156 already consented, delivered and constructed). As such there would be reduced traffic impacts associated with the proposed extension through the community and on roads to and from Site.

A Traffic Management Plan (TMP) will be prepared to include appropriate control measures to manage the level of effects.

Operational Phase

The proposed Development, once operational, would have negligible traffic/transport related impacts, caused by maintenance vehicles travelling to the Site.

Cumulative Assessment

The cumulative impacts from the other local windfarm developments would normally be identified to highlight the possible accumulation of construction traffic in the local area. As it is anticipated that any combination of construction traffic would be below previously permitted numbers, this will not be necessary.

Method of Assessment and Reporting

The EIA Chapter will include a detailed assessment of the current conditions and will focus on the potential effects during the construction phase. This will include a brief construction works programme, a description of the type of vehicles used during the construction phase and an estimate of the number of trips anticipated to be generated by HGVs, LGVs and other vehicles.

The assessment of the construction phase impacts will include a comparison of the possible impacts associated with the proposed extension against the permitted and accepted impacts generated by the much larger Arecleoch and Kilgallioch Windfarms. The current base traffic flows will be described, the previous assessments will be reviewed in full and any changes from previous assessments discussed.

Mitigation measures to deal with the known local traffic issues arising from windfarm construction traffic will not be identified, with the exception of preparation of a Traffic Management Plan prior to the commencement of development and the assessment will not include a review of impacts associated with AIL.

Desk Study

The following data collection and analysis will be undertaken:

- a review of available Arecleoch and Kilgallioch Windfarm development application documents;
- analysis of commissioned traffic count data and accident data;

- assessment of traffic impacts of previous developments to understand identified effects;
- a comparison between likely traffic flows on potentially affected roads against previous windfarm generated traffic, reported as percentage increases; and
- identification of the reduced impacts.

Field Surveys

A Site inspection will not be required and it is expected that a route to port inspection will not be undertaken as it is believed that the access is suitable and will not require improvements.

24 hour automatic traffic counts (ATCs) have been commissioned covering a period of seven days on the A714 road, with one ATC near each Site access. Speeds have also been taken in order to determine the 85%ile speeds. A junction turning count has also been undertaken to provide traffic flow data for the Gowlands Terrace/Main Street junction.

Mitigation Measures

Mitigation measures will not be required, however a Traffic Management Plan (TMP) would be prepared prior to the commencement of development.

Consultation

The proposed Development will continue to be discussed with the following bodies/ organisations:

- SAC – Consultation to discuss the potential impacts of the development on the local road network and cumulative traffic effects;
- D&GC – Consultation to discuss the potential impacts of the development on the local road network and cumulative traffic effects;
- Ayrshire Roads Alliance - Consultation to discuss the potential impacts of the development on the local road network and cumulative traffic effects;
- Transport Scotland – Consultation to discuss the potential impact of the development on the trunk roads used for the transport of abnormal loads; and
- Sustrans – Consultation in relation to potential impacts on pedestrians and cyclists.

Matters Scoped Out

A full environmental assessment of the traffic impacts is not required as it will be demonstrated that the proposed will have significantly reduced traffic flows when compared to the much larger, permitted and constructed local wind farms (eg Kilgallioch and Arecleoch), with reduced environmental impacts.

Due to the negligible environmental effects during the operational and decommissioning phases of the proposed Development, it is proposed that operational effects are scoped out of the access, traffic and transport assessment for the EIA.

Given the presence of the existing windfarms and the established knowledge of the routes to port, it is assumed that there is an approved route to the Site from port of delivery to the Site access. Therefore a

review of previous assessments or an evaluation of abnormal load routes is not included within the scope of the EIA Report.

References and Standard Guidance

The access, traffic and transport assessment will be carried out in accordance with the following policy and guidance documents:

- Scottish Planning Policy (SPP);
- Institution of Highways and Transportation (IHT) publication 'Guidelines for Traffic Impact Assessment';
- 'Guidelines for the Environmental Assessment of Road Traffic' (1993) from the Institute of Environmental Management and Assessment (IEMA);
- Transport Scotland "'Transport Assessment and Implementation: A Guide'; and
- Department for Transport (DfT) 'Design Manual for Roads and Bridges' (DMRB).

QUESTIONS

Q19: Confirmation is sought on the acceptability of the proposed transport route to the site.

Q20: Are there any other relevant consultees who should be contacted with respect to the access, traffic and transport assessment?

Q21 Confirmation that a full environmental assessment of the traffic impacts is not required as it will be demonstrated that the proposed will have significantly reduced traffic flows when compared to the much larger, permitted and constructed local wind farms (eg Kilgallioch and Arecleoch), with reduced environmental impacts.

12. NOISE

Introduction

Noise can arise from both the construction and the operation of windfarms. The noise assessment will therefore evaluate the effects of construction and operational noise of the proposed Development on nearby noise sensitive receptors. This Section of the Scoping Report has been prepared by Hoare Lea Acoustics, who will also undertake the noise assessment for the EIA.

Environmental Baseline and Potential Sources of Impact

Baseline Conditions

The proposed Development Site is located in an area of low population density, with a settlement at Barrhill to the north-east. 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 local roads and water courses in some cases.

For the EIA, the baseline environment will be assessed by measuring background noise levels as a function of Site wind speed at the nearest 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'[16].

The baseline measurements previously made as part of the application for neighbouring windfarms, such as for example the Arecleoch, Mark Hill and Altercannoch Windfarms, will be considered. This may avoid the need for baseline measurement at locations which could be influenced by the turbines of the Arecleoch and Kilgallioch Windfarms when operating, which must be avoided under the requirements of ETSU-R-97. Consideration will also be given to new measurements using wind direction filtering to minimise the influence of existing operating windfarms in the area.

The exact measurement locations and survey methodology are to be discussed and agreed in consultation with the Environmental Health Department at SAC. It is likely that noise monitoring at around 5 properties will be proposed to provide appropriate representative data.

Potential Sources of Impact

During construction, noise could arise from both on Site activities, such as, the construction of on Site access tracks, turbine foundations, the control building (substation) etc., and also from the movement of construction related traffic both on Site and travelling on public roads to and from the proposed Development.

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 windfarm and distances to neighbouring dwellings, the risk of significant effects relating to ground borne vibration during construction is generally very low. These potential impacts will however be assessed as set out below.

During their operation, windfarms 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

[16] The Working Group on Noise from Wind Turbines, (1996). ETSU-R-97, the Assessment and Rating of Noise from Windfarms, Final Report for the Department of Trade & Industry.

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.

Method of Assessment and Reporting

Construction Noise

In assessing the impact of construction noise and vibration, it is usual to accept that the associated works are of a temporary nature. The assessment of potential impacts due to noise emissions during construction 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[17]. This standard is referenced in Technical Advice Note to PAN 1/2011: Planning and Noise[18]. This standard can be used to predict noise levels associated with the different construction activities used throughout the construction programme. Part 2 of the BS 5228 standard[19] considers construction vibration and this will also be referenced.

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 Access, Traffic and Transport chapter of the EIA Report (refer to Section 12 of this report), the impact of traffic along the Site access route will be assessed on the basis of the methodology within BS 5228-1, as well as the 'Calculation of Road Traffic Noise'[20] publication, where appropriate.

The assessment of the temporary effects of construction 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.

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 area. For construction traffic, the criteria set out in the Design Manual for Roads and Bridges[21] are also likely to be referenced. Construction noise management procedures will also be determined.

Cumulative construction noise effects are generally unlikely to be significant but will be assessed if there is a likelihood that the construction programmes and the location of the works (and/or access tracks) is likely to overlap significantly.

Operational Noise

The methodology for the assessment of operational noise from windfarms in Scotland recommended in planning guidance is that documented in ETSU-R-97. In summary, the assessment shall:

- identify the nearest noise sensitive receptors;

[17] BS 5228-1:2009 (amended 2014)'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise'
[18] Planning Advice Note (PAN) 1/2011 and associated Technical Advice Note.
[19] BS 5228-2:2009 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration'
[20] Calculation of Road Traffic Noise, HMSO Department of Transport, 1988.
[21] Design Manual for Roads and Bridges, Volume 11, section 3, Part 7, Traffic Noise and Vibration, The Highways Agency, Transport Scotland, Transport Wales, The Department for Regional Development (Northern Ireland).

- 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 proposed for the Site;
- 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 windfarm noise emission levels with the derived noise limits.

When considering neighbouring cumulative windfarm noise, the potential noise emissions from the adjacent windfarm sites will be considered by examining the potential level of noise emission allowed under the respective consent for each of the Sites, in line with current best practice (see guidance referenced below).

The baseline environment will be assessed by measuring background noise levels as a function of Site wind speed at a representative sample of the nearest neighbours. The good practice guidance referenced below will be taken into account, including advice on baseline survey, wind shear assessment and noise prediction methodology.

Mitigation of operational noise would be achieved through the design of the project, such that the relevant ETSU-R-97 noise limits can be achieved at the surrounding properties with commercially available wind turbines, taking into account the noise emissions from cumulative windfarms in the area.

The calculated windfarm noise emission levels will be compared with the noise limits derived in accordance with ETSU-R-97 and assessed in the light of relevant planning requirements. The noise limits derived according to ETSU-R-97 guidance, for each noise-sensitive receptor, apply to the total noise produced by all windfarms. Therefore, potential cumulative operational noise levels, including existing, consented and application wind turbines in the area, must be assessed relative to these limits. As the proposed Development represents an extension of the existing Arecleoch Windfarm, both windfarms can operate within the same noise limits from a cumulative point.

Consultation

The proposed baseline measurement locations will be selected in consultation with the Environmental Health Department at SAC. The assessment methodology, in particular with regards to cumulative impacts, will also be discussed with SAC.

Matters Scoped Out

It is recognised that vibration resulting from the operation of windfarms 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.

References and Standard Guidance

The following policies are of relevance to the noise assessment:

- Scottish Planning Policy (SPP);
- Planning Advice Note PAN1/2011;

- Onshore Wind Turbines (web-based planning advice note)[22]; and
- South Ayrshire Council Local Plan (2014).

SPP requires consideration of potential noise impacts for developments such as this 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 windfarms.

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

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'[23]. This includes guidance on the assessment of cumulative operational noise impacts from windfarms, and on this point, further guidance set out in a recent article in the Institute of Acoustics Noise Bulletin[24] will also be considered.

PAN1/2011 and the Technical Advice Note accompanying PAN1/2011 provide further advice on construction noise and make reference in particular to British Standard BS 5228.

QUESTIONS

Q22: Confirmation is sought from the Environmental Health Officer on the scope of the cumulative assessment.

Q23: Are there any other relevant consultees who should be contacted with respect to the noise assessment?

Q24: Confirmation that operational vibration can be scoped out of the assessment is requested.

[22] https://beta.gov.scot/publications/onshore-wind-turbines-planning-advice/
[23] M. Cand, R. Davis, C. Jordan, M. Hayes, R. Perkins (2013). A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise, Institute of Acoustics.
[24] Wind farms cumulative impact assessment, Bowdler *et. al.*, Institute of Acoustics Noise Bulletin Vol.41 No. 1, Jan/Feb 2016.

13. LAND USE AND SOCIO-ECONOMICS

This Section considers the scope of work required to assess potential significant effects associated with land use and socio-economics during the construction and operational phases of the proposed Development. Socio-economic effects may occur as a result of direct or indirect interaction between the proposed development and socio-economic resources, and may be both positive and negative.

The assessment considers construction phase effects, during which time there may be temporary adverse effects on public access to the site and surrounding area but also beneficial effects on the local labour market and supply chain.

Once operational, impacts on the labour market and supply chain may be significant. Socio-economic benefits to the community would also arise from community benefit fund payments and any shared ownership initiatives. The assessment also considers any long term effects on land use and nearby recreational receptors including those that may have a value as tourism assets.

Environmental Baseline and Potential Sources of Impact

Study Area

A two-tiered study area is proposed for the assessment, defined as follows:

Wider Study Area (WSA)

The WSA is intended to encompass the area within which significant effects on employment and the local economy could occur. The WSA is required for certain receptor groups because the majority of the business and labour market effects that could occur would be experienced by population and business centres located across a wide area. The WSA area is primarily set at the boundary of the South Ayrshire and Dumfries and Galloway administrative area but effects are also considered within the rest of Scotland and the UK where relevant.

Local Area of Influence (LAI)

The LAI forms the focus for assessment of both direct and indirect effects on those receptors that are likely to experience effects at a more local level, specifically land use and tourism assets. The LAI for such projects is generally defined by the application boundary together with an area extending to 5km from the Site. A 5km LAI would encompass Barrhill and surrounding small communities such as Colmonell, and Pinwherry. As the proposed application boundary extends some way to the east to connect the access road with the A714 at Wheeb Bridge, the LAI would include the western edge of the Galloway Forest Park (including Galloway Forest Dark Skies Park).

Baseline

The baseline description will cover the following topic areas:

- demographic and labour market characteristics (covering the occupational profile and the availability of skills within the labour force);
- employment, economic activity and unemployment trends;
- commuting pattern;

- business demography: the number, size profile and sectoral representation of the business base, including the tourism sector and construction;
- recreational assets such as long distance routes and other local attractions and businesses that depend on visitors such as accommodation businesses;
- large scale outdoor events that are likely to introduce more visitors to the area; and
- land use, including public access.

Potential Sources of Impact

During construction there would be beneficial effects on the local and Scottish economy, including employment opportunities for construction businesses, supply chain and increased spend on local services and accommodation for workers. The proposed Development would lead to investment within the WSA and Scotland, and the assessment will identify the potential benefit to businesses and the local supply chain and seek to quantify the potential effect on the WSA.

Construction activities may also have a temporary adverse impact on certain local receptors including walkers and other users of recreational routes, however effects on local accommodation businesses would be beneficial if used by construction workers. There is potential for construction activities to cause disruption to planned outdoor events especially those using the construction traffic route or passing through the Site, and the assessment will identify whether this is likely to occur.

Socio-economic effects during operation of the proposed Development include employment on management and maintenance of the windfarm, spend on local services and supply chains and direct benefits to local businesses such as shops, accommodation providers, fuel and catering suppliers. This is potentially significant given the length of the operational period.

There is, however, potential for further beneficial effects on the local economy due to the proposal for shared ownership with the local community. The community's returns on their investment could be directly invested in the community for example in developing skills and training. These income streams could provide benefit to the local area for the lifetime of the windfarm and beyond, the significance of which will be reported in the EIA Report.

Method of Assessment and Reporting

There is no industry standard guidance for this assessment. The proposed method for assessment, based on experience on similar projects, is detailed below and will take into consideration any matters raised in this scoping exercise. The assessment will:

- consider the social and economic policy context at the local, regional and national level;
- review land use, socio-economic baseline conditions within the relevant study areas;
- assess the likely scale, scope, permanence and significance of identified effects, taking account of any embedded environmental or social measures proposed within the application;
- recommend mitigation measures, where appropriate; and
- assess cumulative effects of the scheme with other proposed schemes.

Receptor sensitivity will be based on the importance or scale of the receptor and the ability of the baseline to absorb or be influenced by the identified effects. For example, a receptor is considered less sensitive if there are alternatives with capacity within the study area. In assigning receptor sensitivity, consideration has been given to the following:

- the capacity of the receptor to absorb or tolerate change;
- the importance of the receptor e.g. local, regional, national, international;
- the availability of comparable alternatives;
- the ease at which the resource could be replaced; and
- the level of usage and nature of users (e.g. sensitive groups such as people with disabilities).

In order to aid clear and robust identification of significant effects, specific and targeted criteria for defining the magnitude of impacts have been developed for this assessment based on experience on other similar projects. The following four levels of magnitude will be adopted using professional judgement: high; medium; low and negligible. These reflect the level of change relative to baseline conditions and /or whether the change would affect a large proportion of the existing resident population and /or would result in a major change to existing patterns of use. Impacts can be beneficial, adverse or neutral.

The level of effect of an impact on socio-economic receptors is initially assessed by combining the sensitivity of the receptor and the magnitude of the impact. Where an effect is classified as major, this is considered to represent a 'significant effect' in terms of the EIA Regulations. Where an effect is classified as moderate, this may be considered to represent a 'significant effect' but would be subject to professional judgement and interpretation, particularly where the sensitivity or impact magnitude levels are not clear or are borderline between categories or the impact is intermittent.

Effects can be beneficial, neutral or adverse and these would be specified where applicable. It should be noted that significant effects need not be unacceptable or irreversible.

A statement of residual effects, following consideration of any specific mitigation measures, will be provided.

A review of policy and guidance (national and local) that is relevant to land use, socio-economics, recreation and tourism will be prepared for the EIA Report. This will cover community/shared ownership and benefits.

Consultation

The assessment will use desk-based information sources to assess the likely effects, supplemented by consultation with stakeholders if necessary. Information to inform the baseline will be sought from various sources, including:

- SAC;
- D&GC;
- Galloway Forest Park (Forest Enterprise Scotland);
- Ayrshire Economic Partnership;
- British Horse Society Scotland;

- Cycling Scotland;
- Community Councils, including Barrhill, Pinmore and Pinwherry, Colmonell and Lendalfoot, Ballantrae, Cree Valley and New Luce;
- Scottish Association for Country Sports;
- Scottish Rights of Way and Access Society;
- Sustrans Scotland; and
- Visit Scotland.

Any consultation would have three key objectives:

- to verify published information;
- to identify potential effects; and
- to help assess significance of potential impacts.

Matters Scoped Out

As the construction phase of the windfarm would be relatively short term (16 months) it is not expected that construction workers from outside the WSA would have a significant effect on the demand for housing, health or educational services. Effects on demand for these services are therefore scoped out.

Recreational activities out with the Site are scoped out unless they are promoted regionally/nationally and are therefore likely to draw in visitors from outside the area. Recreational use of the Site will be considered under land use effects.

Effects on the tourism economy due to the presence of the windfarm (operational phase) are scoped out as a number of published studies have examined whether there is a link between the development of windfarms and changes in patterns of tourism spend and behaviour, and the consistent conclusion is that there is little or no adverse effect. Two of the most recent studies were undertaken by ClimateXChange for Scottish Government in 2012 and BiGGAR Economics in 2016; both studies found that despite a large increase in installed onshore wind capacity over their respective study periods, tourism had also increased and there was little or no adverse impact on tourism in Scotland.

The presence of the windfarm is only likely to affect individual recreation and tourism receptors through visual impacts and would be viewed in the context of the existing Arecleoch Windfarm; these will be assessed in the Landscape and Visual Impact Assessment (refer to Section 6 of this Report).Land use effects during the operational phase are scoped out as the operation of the windfarm would have minimal effect on agricultural or recreational uses.

References and Standard Guidance

The assessment will follow current best practice guidance as set out in the following documents:

- Scottish Planning Policy (2014), in particular paragraph 169;
- National Planning Framework 3 (2014);

- Scottish Natural Heritage (2013), A Handbook on Environmental Impact Assessment.
- Scottish Government (2015), Good Practice Principles for Shared Ownership of Onshore Renewable Energy Developments;
- Scottish Government (2014), Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments;
- Scottish Government (2016), Draft Advice on Net Economic Benefit and Planning; and
- Scottish Natural Heritage (2015). Good Practice During Wind Farm Construction.

QUESTIONS

Q25: Confirmation that the proposed study area is considered appropriate for the assessment is requested.

Q26: Are there any other relevant consultees who should be contacted with respect to the socio-economic assessment?

14. FORESTRY

Introduction

This Section of the Scoping Report sets out the approach which would be used to integrate the proposed Development into the existing woodland structure. A Windfarm Forest Plan would be prepared and included as a technical appendix to the EIA Report, which would detail felling and replanting proposals, illustrating the forestry requirements associated with the construction and operation of the proposed Development.

This Section of the Scoping Report has been prepared by DGA Forestry.

Environmental Baseline and Potential Sources of Impact

Baseline Conditions

The proposed Development is located in an area with extensive commercial woodlands, which form part of the National Forest Estate managed by Forest Enterprise Scotland (FES). The land available for the proposed Development is largely forested, with the remainder comprising small areas of open ground for management boundaries, roads, unplantable land and margins beyond the woodland edge. The woodlands within the land available for the proposed Development consist primarily of commercial conifers.

A desk based assessment reveals no woodland designations affecting the woodlands. Areas are identified as Primary and Secondary Zones for potential native woodland expansion under the Native Woodland Integrated Habitat Network. The associated core areas of the Native Woodland Integrated Habitat Network are located out with the application boundary. The commercial conifer crops are now moving into the second rotation, with ongoing felling and replanting of mature woodlands.

The timber from the Site would be despatched via the Barrhill Strategic Timber Haul route to the A714 at Wheeb Bridge, which is an agreed route for timber traffic.

The forestry baseline will describe the crops existing at the time of preparation of the EIA Report. This will include current species; planting year; felling and restocking plans contained within the existing FES Land Management Plan; and other relevant woodland information. It will be prepared from existing forest records; desk based assessments; site visits; and aerial photographs.

Potential Effects and Assessment

There is potential for changes to the forest structure resulting from the proposed Development, with consequential implications for the wider felling and restocking plans across the forest area. Areas of woodland may need to be felled for the construction and operation of the proposed Development including for access tracks, turbine locations and other infrastructure.

The potential effects would be changes to the structure of the woodlands, which may result in a loss of the total woodland area, e.g. to windfarm infrastructure. This would be addressed through a redesign of the existing forest including, for example, the use of designed open space; alternative woodland types; changing the management intensity; or the provision of compensation planting on or off Site. The changes to the forests for a particular development are regarded as Site specific and it is considered that there are no cumulative forestry issues to be addressed.

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Method of Assessment and Reporting

Guidance and Legislation

In the UK there is a strong presumption against permanent woodland removal, unless it addresses other environmental concerns or where it would achieve significant and clearly defined additional public benefits (eg restoration of a Priority Phase 1 Habitat). In Scotland, such woodland removal is dealt with under the Scottish Government's *'Control of Woodland Removal Policy'* (2009). The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. It is essential that the requirements of the Policy are addressed and reported in the EIA Report. The integration of the proposed Development into the existing Land Management Plan will be a key part of the development process.

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

- Dumfries and Galloway Council (2014): The Dumfries and Galloway Forestry and Woodland Strategy, D&GC: Dumfries.
- Forestry Commission (2017). The UK Forestry Standard: The Government's Approach to Sustainable Forestry, Forestry Commission: Edinburgh.
- Forestry Commission Scotland (2009). The Scottish Government's Policy on Control of Woodland Removal, Edinburgh.
- Forestry Commission Scotland (2015): Guidance to Forestry Commission Scotland staff on implementing the Scottish Government's Policy on Control of Woodland Removal.
- The Scottish Government (2006). The Scottish Forestry Strategy, Scottish Government: Edinburgh.
- The Scottish Government (2011). Scottish Land Use Strategy, Scottish Government: Edinburgh.
- The Scottish Government (2012): Waste (Scotland) Regulations 2012.
- The Scottish Government (2014a). Scotland's Third National Planning Framework (NPF3, Scottish Government: Edinburgh.
- The Scottish Government (2014b). Scottish Planning Policy, Scottish Government: Edinburgh.
- SEPA (2013): SEPA Guidance Notes WST-G-027 Management of Forestry Waste.
- SEPA (2014): LUPS-GU27 Use of Trees Cleared to Facilitate Development of Afforested Land.
- UKWAS (2018). The UK Woodland Assurance Standard, 4th Edition, UKWAS: Edinburgh.

Assessment

Forestry does not fit well into the standard EIA process. Commercial forests are dynamic and constantly changing through landowner activities, market forces and natural events such as windblow, pests and diseases.

The forestry report would not, therefore, be presented as a formal EIA chapter, rather it would be a factual report describing the changes to the forest structure resulting from the incorporation of the proposed Development into the forest. This would include the changes to, for example, the woodland composition and felling programmes. The forestry report would be presented in a Technical Appendix to the EIA

Report. The effects of the proposed Development related arising from forest felling and restocking would be assessed in the relevant chapters of the EIA Report, including Ecology; Landscape and Visual; Hydrology, Hydrogeology, Geology and Peat; Ornithology; and Traffic and Transport.

The principal output would be the preparation of the Windfarm Forest Plan. This would include a felling plan to show which woodlands would be felled and when they are to be felled during the life of the proposed Development. It would further include a restocking plan showing which woodlands are to be replanted and when during the life of the proposed Development. The changes to the woodland structure would be analysed and described including changes to species composition, age class structure, timber production, traffic movements and the felling and restocking plans. It would also be presented as an appendix to the EIA Report.

The resulting changes to the woodland structure and any requirement for compensation planting to mitigate against any woodland loss would be considered in the context of the Control of Woodland Removal Policy and in consultation with FCS.

Consultation

The main forestry consultee is Forestry Commission Scotland (FCS), South Scotland Conservancy.

FCS will be consulted throughout the development of the proposals and the EIA to ensure that the proposed changes to the woodlands are appropriate and address the requirements of the Control of Woodland Removal Policy and other guidance. In addition, there may be interrelated issues raised by other consultees which would be addressed within the forestry report, for example from SEPA on forestry residues, and D&GC on timber transport.

15. AVIATION

Introduction

The operation of wind turbines has the potential to cause a variety of adverse effects on aviation during turbine operation.

These include but are not limited to:

- Physical obstructions;
- Generation of unwanted returns on Primary Surveillance Radar (PSR); and
- Adverse effects on overall performance of Communications, Navigation and Surveillance (CNS) equipment.

Baseline Conditions

The Site is approximately 45 km south west of Glasgow Prestwick Airport and over 87km south west of Glasgow Airport, the two major airports in the west of Scotland. From previous assessments it has been deemed that the proposed Development is not within radar line of sight of either airport.

Furthermore, the Site is understood to have no visibility from any NATS (En Route) plc (NERL) radar or any other airport radars.

The Development is located on the edge of a little used Ministry of Defence (MoD) low flying area but the developable area is out with the MoD low flying zone. The MoD will be consulted during planning but no objection is anticipated. It is noted that the MoD may request some infra-red turbine lighting to be installed on the turbines as part of the Development. There have been no previous objections from the MoD in regards to the West Freugh range in the case of the operational Kilgallioch or Arecleoch Windfarms.

As the proposed turbines would exceed 150m to tip height it is understood that Civil Aviation Authority Article 222 requires aviation lighting 2000 candela on the hub of the turbines and 32 candela on the towers of the turbines.

It is anticipated that the proposed Development will not cause a significant effect on aviation interests.

Consultation

The scope of any aviation impact assessment, if required, will be based on the outcome of consultation discussions with the relevant aviation consultees, including:

- Civil Aviation Authority (CAA)
- Defence Estates (MoD)
- National Air Traffic Services (NATS) Safeguarding
- Prestwick Airports Ltd

16. OTHER ISSUES

Introduction

A single chapter will be prepared to draw together the implications of the proposed Development on other facets of the environment that have been scoped out of the EIA process, or to signpost readers to where they are dealt with within technical chapters of the EIA Report. It is anticipated that this Chapter would include discussion of the following issues:

- Infrastructure;
- Telecommunications;
- Television Reception;
- Shadow Flicker;
- Climate and Carbon Balance;
- Air Quality;
- Population and Human Health; and
- Waste and Environmental Management.

Infrastructure

Overhead power lines operated by Scottish Power Energy Networks cross the north of the Site from east to west. These power lines emanate from the existing Arecleoch Windfarm substation, which is also located within the Site red line boundary.

A road and railway line cross the Site and these will have to be considered during both design and construction.

Details and locations of other infrastructure will be checked and taken into account during the design of the proposed Development.

Telecommunications

Wind turbines have the capability of affecting electromagnetic transmissions by physically blocking or dispersing the transmission/signal. This means that telecommunications and/or broadcast signals could experience interference.

Consultation will be undertaken with Ofcom and key providers of these services in order to ascertain any potential Telecommunications issues.

Television Reception

Wind turbines have the potential to adversely affect analogue television reception through either physical blocking of the transmitted signal or, more commonly, by introducing multi-path interference where some of the signal is reflected through different routes.

The proposed Development is located in an area which is now served by a digital transmitter and, therefore, is unlikely to be affected by the development of the windfarm as digital signals are rarely affected. In the unlikely event that television signals are affected by the proposed Development, the mitigation measures will be considered by the applicant.

Television reception is, therefore, scoped out from further assessment in the EIA.

Shadow Flicker

Shadow flicker occurs when a certain combination of conditions prevail at a certain location, time of day and year. It firstly requires the sun to be at a certain level in the sky. The sun then shines onto a window of a residential dwelling from behind the wind turbine rotor. As the wind turbine blades rotate it causes the shadow of the turbine to flick on and off. This may have a negative effect on residents in affected properties. If shadow flicker cannot be avoided through design, technical mitigation solutions are available, such as shutting down turbines when certain conditions prevail.

In the UK, significant shadow flicker is only likely to occur within a distance of ten times the rotor diameter (of a wind turbine), from an existing residential dwelling and within 130 degrees either side of north[25].

The rotor diameter of the proposed turbines would not exceed 150m; so the potential area in which shadow flicker could occur would be up to 1,500m from the proposed turbine locations. Once the final turbine layout and parameters are fixed, the locations of residential properties in proximity to the Site will be verified and if any are situated within ten rotor diameters from the proposed turbine positions, a shadow flicker model will be run to predict potential levels of effect.

The location of all residential dwellings in proximity to the Site will be verified during the EIA to ensure no new dwellings have been built since the EIA was undertaken for Arecleoch Windfarm.

If no properties are located within 1,500m of proposed turbine locations then shadow flicker will be scoped out of the assessment.

Climate and Carbon Balance

The EIA Regulations 2017 include for consideration of potentially significant effects on climate which includes greenhouse gas emissions. As a renewable energy project, the proposed Development is likely to result in a significant saving in carbon and therefore benefit to the Scottish Government's Climate Change targets.

The main aims of the calculation are: to quantify sources of carbon emissions associated with the proposed Development (i.e. from construction, operation and transportation of materials, as well as loss of peat as relevant); to quantify the carbon emissions which would be saved by constructing the proposed Development; and to calculate the length of time for the project to become a 'net avoider', rather than a 'net emitter' of carbon dioxide emissions. The length of time is termed the 'payback time'.

A carbon balance assessment will be undertaken for the proposed Development using guidance Calculating Potential Carbon Losses and Savings from Wind Farms on Scottish Peatlands[26].

[25] Parsons Brinckerhoff Consultants on behalf of DECC (2010) Update of UK Shadow Flicker Evidence Base. Available at: http://www.decc.gov.uk/en/content/cms/meeting_energy/renewable_ener/ored_news/ored_news/uk_shad_flick/uk_shad_flick.aspx (Accessed on 28/03/2017)

[26] Calculating Potential Carbon Losses and Savings from Wind Farms on Scottish Peatlands, Nayak et al., 2008; Nayak et al., 2010 and Smith et al., 2011

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Air Quality

Given the relatively remote location of the Site, the generation of dust during construction activity is unlikely to have a direct impact on any human receptors and will be controlled by means of best practice to be described in the EIA Report.

Consideration will be given within the Ecology and Hydrology Chapters to the potential impacts that dust generation could have on any identified sensitive ecological or hydrological receptors. If required, detailed mitigation measures will be proposed within these EIA Report Chapters.

Population and Human Health

The EIA Regulations 2017 include a requirement to assess as part of the EIA process, the potential significant effects on population and human health resulting from the proposed Development. These new requirements will be addressed in the EIA and EIA Report, as appropriate, under each of the other topic headings e.g. noise or socio-economic effects. Where no significant effects are likely these are scoped out of the assessment.

Waste and Environmental Management

SPR is committed to pollution prevention and environmental protection. As such an environmental management strategy to minimise environmental effects of the proposed Development will be developed.

A draft Peat Management Plan will be prepared as a supporting technical appendix in line with the SEPA Regulatory Position Statement: Developments on Peat (2012). If significant peat deposits are proven, a Peat Landslide Hazard and Risk Assessment will be completed using the Site survey data and slope analysis (using DTM data), highlighting areas that may be impacted by a peat slide so that appropriate mitigation measures and can be identified.

If granted planning permission, a Site specific Waste Management Plan which addresses storage and final disposal of surplus material will be produced. All potential waste streams will be identified and what construction practices can be incorporated into the development to minimise the use of raw materials and maximise the use of secondary aggregates.

QUESTIONS

Q27: Are there any other relevant consultees who should be contacted with respect to the other environmental issues?

17. SUMMARY AND MITIGATION SCHEDULE

A Schedule of Mitigation will be included in the EIA Report. This Chapter will summarise the mitigation measures proposed in the preceding Chapters of the EIA Report to reduce or offset the effects of the proposed Development on the environment. These are the measures that have been agreed with the relevant stakeholders and will be applied during the construction and operation of the proposed Development. A number of these measures are embedded mitigation, undertaken through good practice and to adhere to relevant legislation during all stages of the proposed Development.

Table 17.1: Proposed Structure for Schedule of Mitigation

EIA Report Chapter	Matter / Effect Requiring Mitigation	Timing / Phase: Pre-construction / Construction / Pre-Operation / Operation / Decommissioning	Mitigation Measure

18. INVITATION TO COMMENT

You are invited to provide comment on this Scoping Report. Please send all Scoping responses to the Energy Consents Unit:

Energy Consents Unit
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU
Econsents_Admin@gov.scot

If you wish to discuss matters contained in this report in greater detail prior to responding to the scoping exercise, please contact:

Susie Playford
SLR Consulting Ltd
4 Woodside Place
Charing Cross
Glasgow
G3 7QF
splayford@slrconsulting.com

APPENDIX A – PROPOSED SCOPING CONSULTEES

Stakeholder Name	Address	Topics
Ayrshire Rivers Trust	1 Gibbsyard Auchincruive Estate Ayr KA6 5HW	Ecology, Hydrology
Ayrshire Roads Alliance	15 Strand St Kilmarnock KA1 1HU	Traffic and Transport
Ballantrae Community Council Contact: Mhari McKenna	Beachbank House Foreland Ballantrae KA26 0NQ	Socio-economic
Barrhill Community Council Contacts: Celia Strain, Ann Robertson	51 Main Street Barrhill Girvan KA26 0QP	Socio-economic
British Telecom (BT)	BT Business Accounts Providence Row Durham DH98 1BT	Telecommunications
British Horse Society	The British Horse Society Abbey Park Stareton Warwickshire CV8 2XZ	Socio-economic
Civil Aviation Authority (CAA)	45-59 Kingsway London WC2B 6TE	Aviation
Colmonell & Lendalfoot Community Council Contact: Heather O'Hare	6 Kirkhill Crescent Colmonell KA26 0SD	Socio-economic
Cree Valley Community Council Contact: Charles Marshall	6 Riverbank Minnigaff Newton Stewart DG8 6QU	Socio-economic

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Stakeholder Name	Address	Topics
Crown Estate Office	1 St James's Market London SW1Y 4AH	Land use, Access
Defence Estates (MoD)	DIO Headquarters Kingston Road Sutton Coldfield West Midlands B75 7RL	Aviation
Dumfries and Galloway Council	Council HQ English Street Dumfries DG1 2DD	General consultation, cultural heritage, private water supply information, flood risk, socio-economics, traffic and transport, ecology and ornithology.
Fisheries Management Scotland	Fisheries Management Scotland 11 Rutland Square Edinburgh EH1 2AS	Ecology
Forestry Commission Scotland	55/57 Moffat Road Dumfries DG1 1NP	Land use
Historic Environment Scotland	Longmore House Salisbury Place Edinburgh EH9 1SH	Cultural Heritage
John Muir Trust Contact: John Low	Tower House Station Road Pitlochry PH16 5AN	Land use, Landscape and Visual
Joint Radio Company	Joint Radio Company Ltd Friars House Manor House Drive Coventry CV1 2TE	Telecommunications
Marine Scotland	Marine Scotland Mailpoint 11 1B South Victoria Quay Edinburgh EH6 6QQ	Hydrology, Ecology

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Stakeholder Name	Address	Topics
Mountaineering Council of Scotland	Mountaineering Scotland The Granary West Mill Street Perth PH1 5QP	Recreation
National Air Traffic Services (NATS) Safeguarding	NATS 4000 Parkway Whiteley Fareham Hants PO15 7FL	Aviation
Network Rail	1 Eversholt Street London NW1 2DN	Traffic and Transport
New Luce Community Council Contact: Mary Hannay	By email	Socio-economic
Ofcom	125 Princes Street Edinburgh EH2 4AD	Telecommunications
Pinwherry & Pinmore Community Council Contacts: John Yellowlees Hal Maxwell	Pinmore Mains Pinmore Girvan KA26 0TD	Socio-economic
Prestwick Airports Ltd Contact: Alison Blackman	Glasgow Prestwick Airport Aviation House Prestwick Scotland KA9 2PL	Aviation
River Stinchar Salmon Fisheries Board	46 Dalblair Rd Ayr KA7 1UQ	Ecology
RSPB Scotland	South and West Scotland Regional Office 10 Park Quadrant Glasgow G3 6BS	Ornithology
Scottish Environment Protection Agency (SEPA)	Holmpark Industrial Estate New Galloway Road	Hydrology, Hydrogeology Carbon emissions

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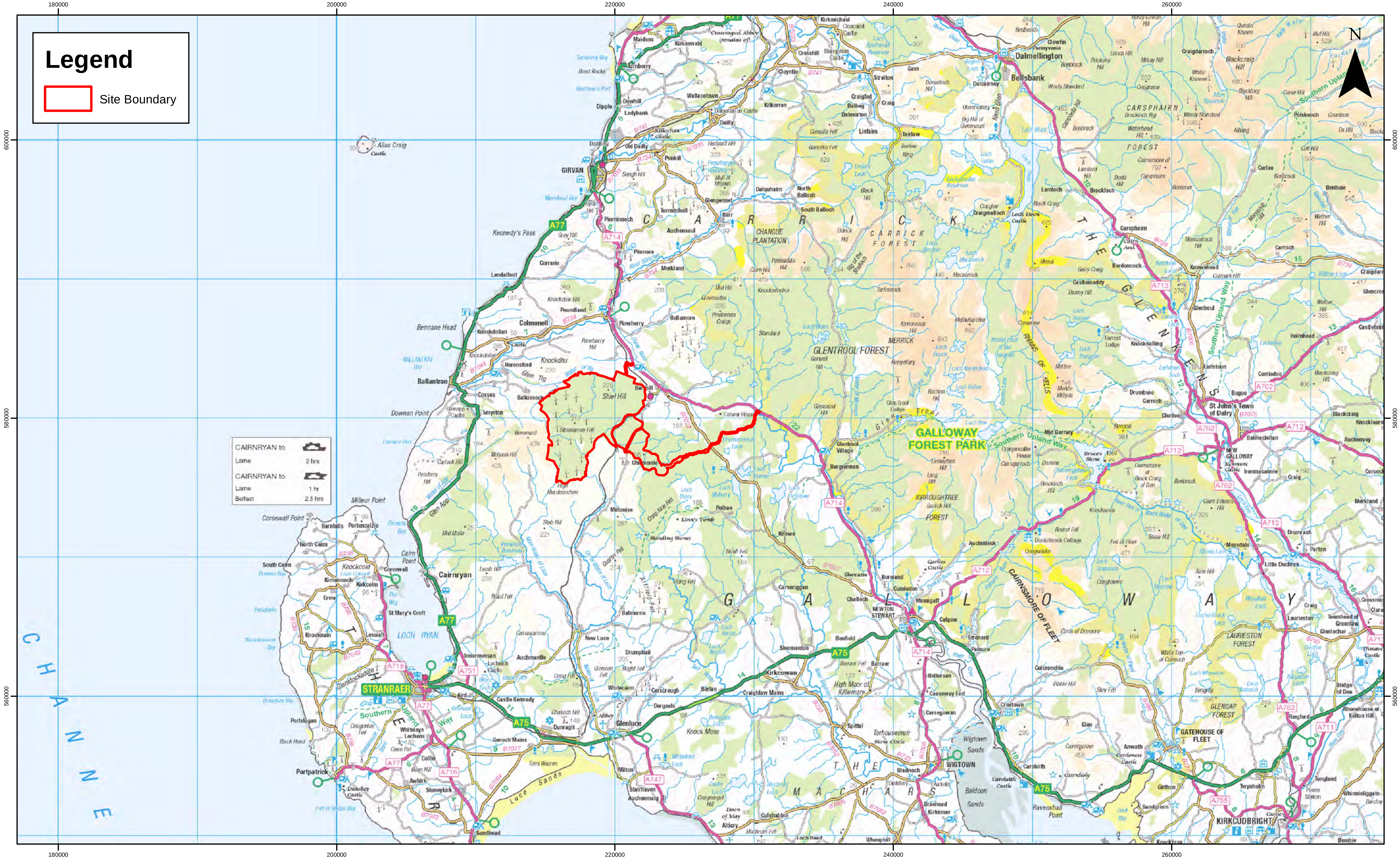
Stakeholder Name	Address	Topics
	Minnigaff Newton Stewart DG8 6BF	Peat Management (only if there is a concern regarding disposal of peat) Ecology
Scottish Government Energy Consents Unit Contact: Josh McCormack	Energy Consents Unit 5 Atlantic Quay 150 Broomielaw Glasgow G2 8LU	General consultation
Scottish Natural Heritage (SNH) Contact: Fiona Findlay	Holmpark Industrial Estate New Galloway Road Newton Stewart Wigtownshire DG8 6BF	Landscape and Visual Impact Assessment methodology and receptors Ecology and ornithology
Scottish Rights of Way and Access Society (Scotways)	24 Annandale Street Edinburgh EH7 4AN	Access
Scottish Water	Castle House 6 Castle Drive Carnegie Campus Dunfermline KY11 8GG	Public water supply infrastructure
Scottish Wild Land Group		Land use, Landscape and Visual
Scottish Wildlife Trust	Harbourside House 110 Commercial St Edinburgh EH6 6NF	Ecology and Ornithology
South Ayrshire Council Contact: David Love	South Ayrshire Council County Buildings Wellington Square Ayr KA7 1DR	General consultation, landscape and visual, noise methodology, cultural heritage, private water supply information, flood risk, socio-economics, traffic and transport, ecology and ornithology.
Transport Scotland	Transport Scotland Buchanan House 58 Port Dundas Road Glasgow G4 0HF	Traffic and Transport
Visit Scotland	Webpage: http://www.visitscotland.org/main/send_related_contacts	Socio-economic

Stakeholder Name	Address	Topics
	_email.aspx?id=17	
West of Scotland Archaeology Service (WOSAS)	231 George St Glasgow G1 1RX	Archaeology and Cultural Heritage



A	27/09/18	LM	First Issue.
Rev	**Date**	**By**	**Comment**

SCOTTISHPOWER RENEWABLES

1:250,000
Scale @ A3

0 5 10 Km

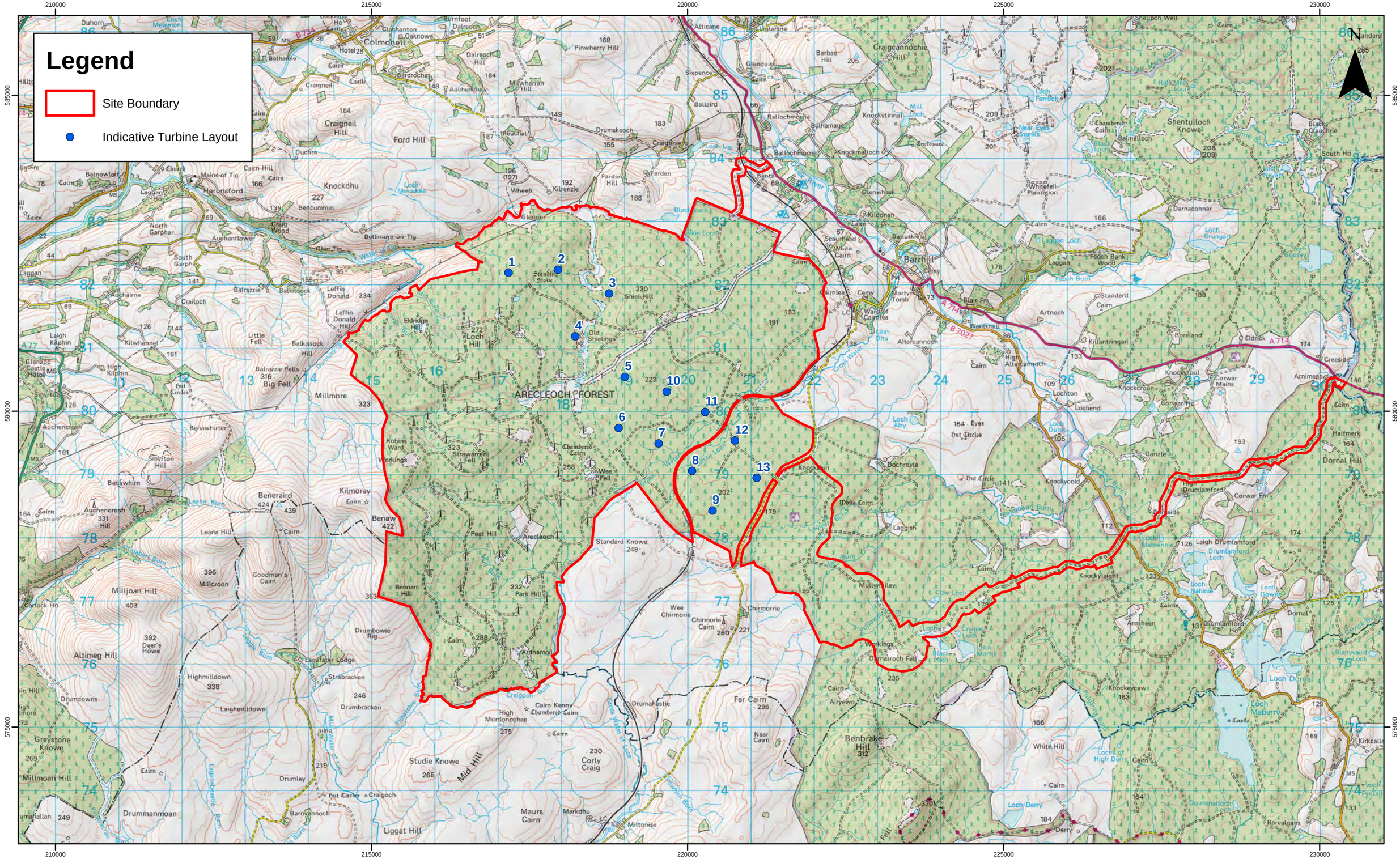
Arecleoch Windfarm Extension

Scoping Report

Site Location

Drg No	00481.00049.1.1.0
Rev	A
Date	09/10/18
Figure	1.1

Datum: OSGB36
Projection: TM



Rev	Date	By	Comment
B	08/10/18	BB	Second Issue.
A	27/09/18	LM	First Issue.

1:55,000 Scale @ A3

0 1 2 Km

Arecleoch Windfarm Extension

Scoping Report

Indicative Site Layout

Drg No	00481.00049.1.2.1
Rev	B
Date	09/10/18
Figure	1.2

Datum: OSGB36
Projection: TM

220000

580000

Legend

Site Boundary

Indicative Turbine Developable Area

N

ARECLEOCH FOREST

220000

Rev	Date	By	Comment
B	08/10/18	BB	Second Issue.
A	27/09/18	LM	First Issue.

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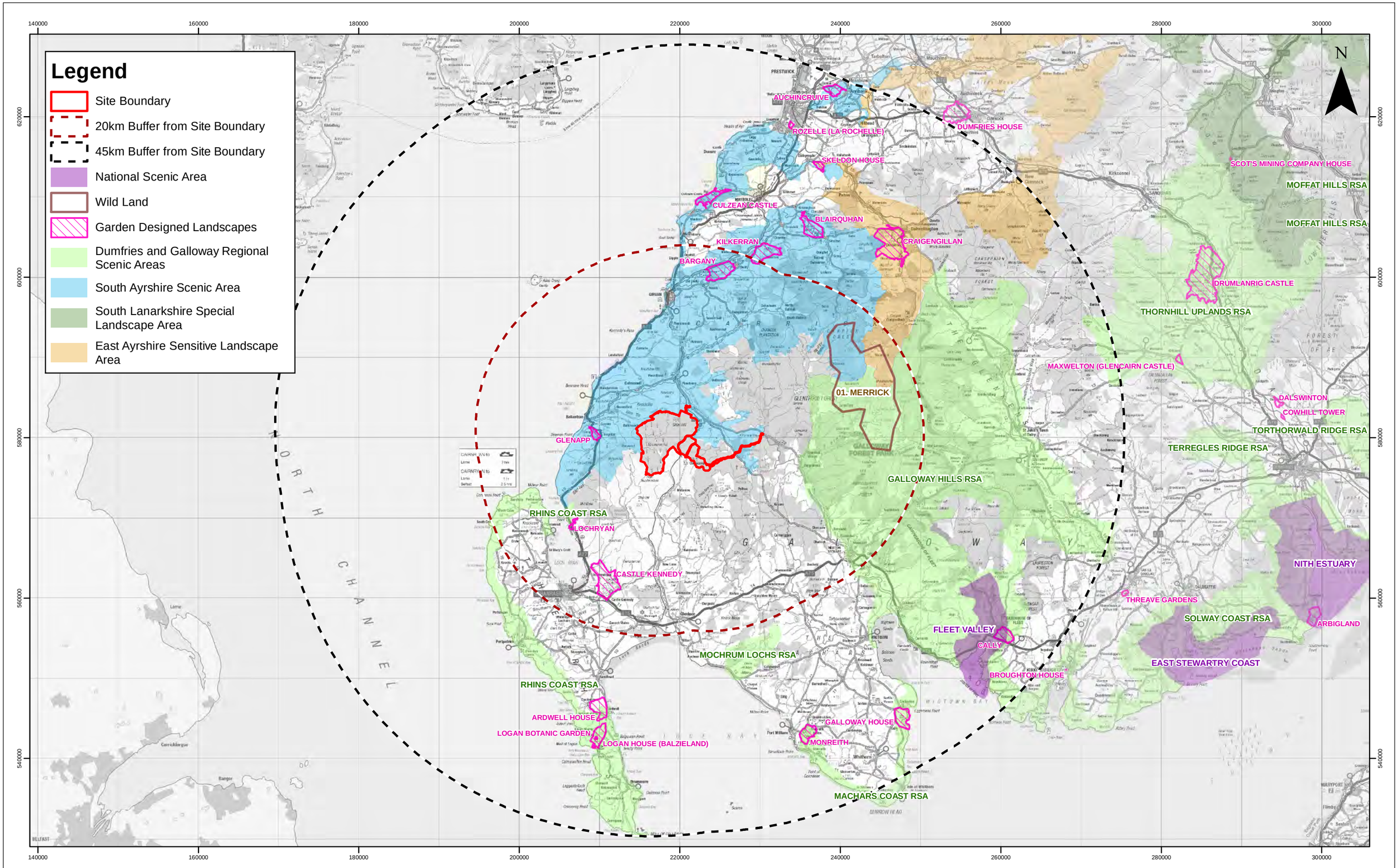
Arecleoch Windfarm Extension
Scoping Report
Proposed Turbine Area

Drg No	00481.00049.1.3.1
Rev	B
Date	09/10/18
Figure	1.3

Datum: OSGB36
Projection: TM



SCOTTISHPOWER RENEWABLES					1:425,000 Scale @ A3	0 10 20 Km
	A	27/09/18	LM	First Issue.	© Crown Copyright 2018. All rights reserved. Ordnance Survey Licence 0100031673.	
	Rev	Date	By	Comment		

Arecleoch Windfarm Extension

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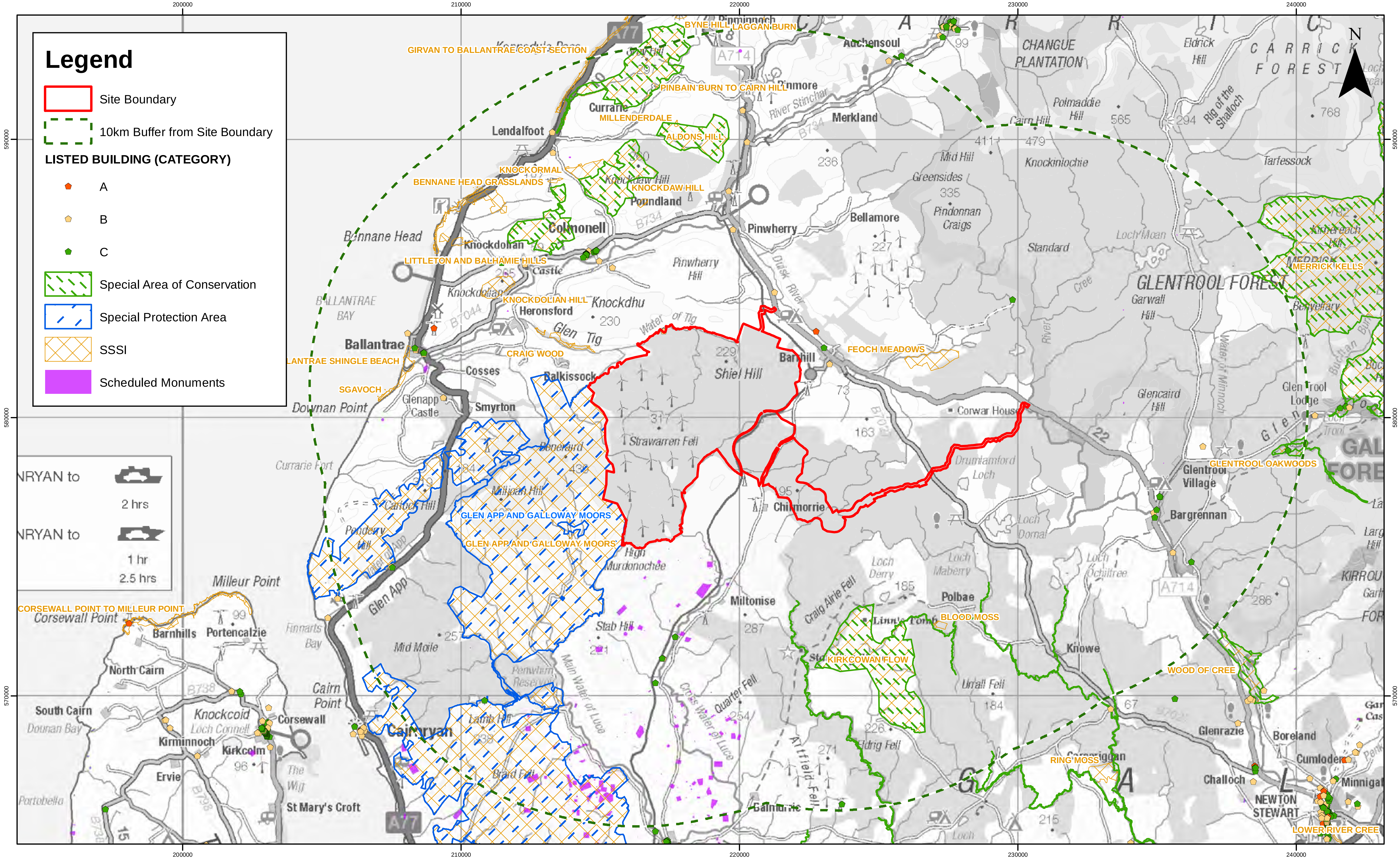
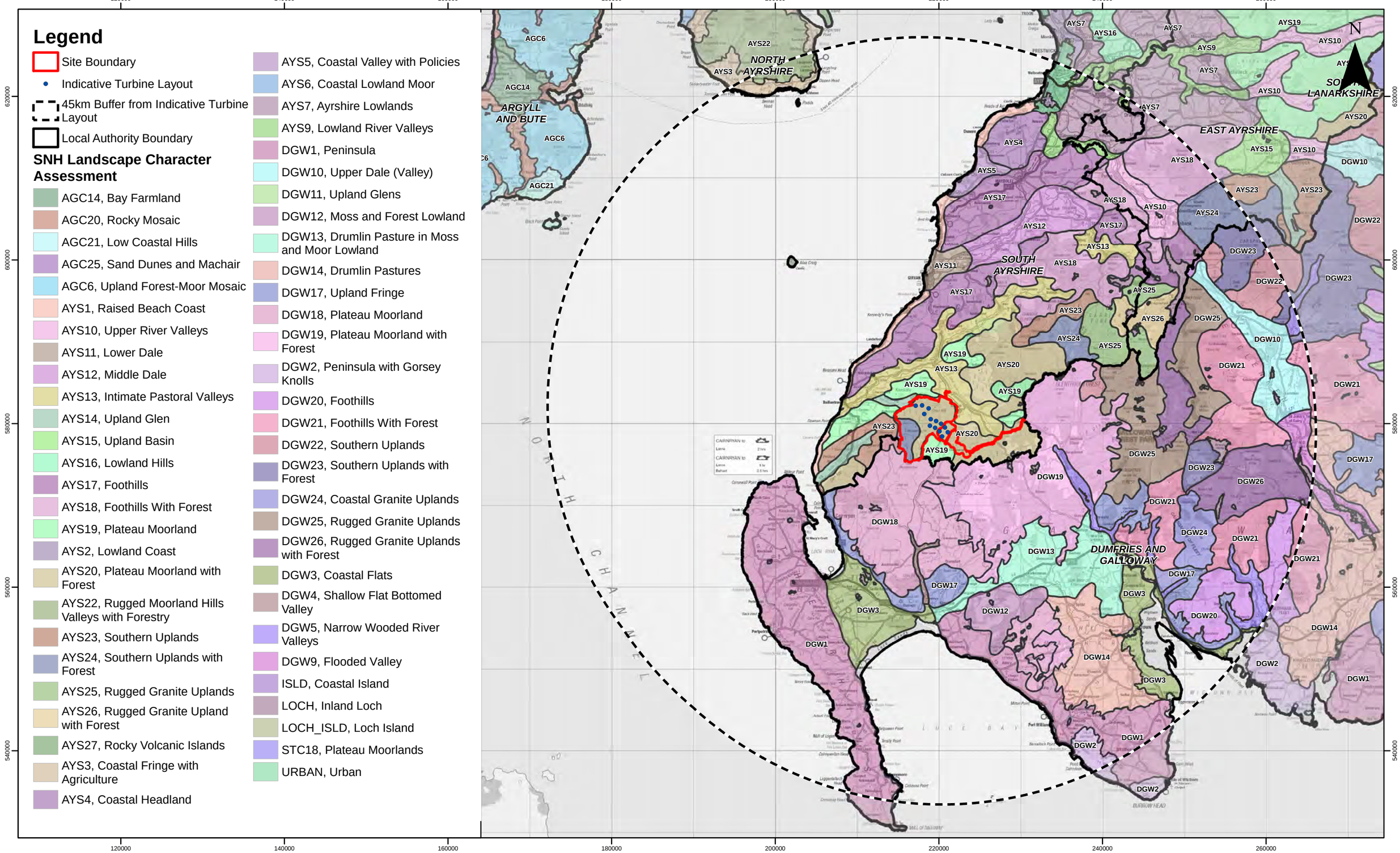
Landscape Designated Sites

Drg No	00481.00049.2.1.0	
Rev	A	Datum: OSGB36 Projection: TM
Date	27/09/18	
Figure	2.1	



				1:125,000 Scale @ A3	0 — 2.5 — 5 Km	**Arecleoch Windfarm Extension** Scoping Report Other Designated Sites	**Drg No**	00481.00049.2.2.0	
SCOTTISHPOWER RENEWABLES							**Rev**	A	Datum: OSGB36 Projection: TM
	A	27/09/18	LM	First Issue.			**Date**	09/10/18	
	Rev	**Date**	**By**	**Comment**			**Figure**	2.2	



Legend

- Site Boundary
- Indicative Turbine Layout
- 45km Buffer from Indicative Turbine Layout
- Local Authority Boundary

SNH Landscape Character Assessment

- AGC14, Bay Farmland
- AGC20, Rocky Mosaic
- AGC21, Low Coastal Hills
- AGC25, Sand Dunes and Machair
- AGC6, Upland Forest-Moor Mosaic
- AYS1, Raised Beach Coast
- AYS10, Upper River Valleys
- AYS11, Lower Dale
- AYS12, Middle Dale
- AYS13, Intimate Pastoral Valleys
- AYS14, Upland Glen
- AYS15, Upland Basin
- AYS16, Lowland Hills
- AYS17, Foothills
- AYS18, Foothills With Forest
- AYS19, Plateau Moorland
- AYS2, Lowland Coast
- AYS20, Plateau Moorland with Forest
- AYS22, Rugged Moorland Hills Valleys with Forestry
- AYS23, Southern Uplands
- AYS24, Southern Uplands with Forest
- AYS25, Rugged Granite Uplands
- AYS26, Rugged Granite Upland with Forest
- AYS27, Rocky Volcanic Islands
- AYS3, Coastal Fringe with Agriculture
- AYS4, Coastal Headland
- AYS5, Coastal Valley with Policies
- AYS6, Coastal Lowland Moor
- AYS7, Ayrshire Lowlands
- AYS9, Lowland River Valleys
- DGW1, Peninsula
- DGW10, Upper Dale (Valley)
- DGW11, Upland Glens
- DGW12, Moss and Forest Lowland
- DGW13, Drumlin Pasture in Moss and Moor Lowland
- DGW14, Drumlin Pastures
- DGW17, Upland Fringe
- DGW18, Plateau Moorland
- DGW19, Plateau Moorland with Forest
- DGW2, Peninsula with Gorsey Knolls
- DGW20, Foothills
- DGW21, Foothills With Forest
- DGW22, Southern Uplands
- DGW23, Southern Uplands with Forest
- DGW24, Coastal Granite Uplands
- DGW25, Rugged Granite Uplands
- DGW26, Rugged Granite Uplands with Forest
- DGW3, Coastal Flats
- DGW4, Shallow Flat Bottomed Valley
- DGW5, Narrow Wooded River Valleys
- DGW9, Flooded Valley
- ISLD, Coastal Island
- LOCH, Inland Loch
- LOCH_ISLD, Loch Island
- STC18, Plateau Moorlands
- URBAN, Urban

SCOTTISHPOWER RENEWABLES

Rev	Date	By	Comment
B	08/10/18	BB	Second Issue.
A	27/09/18	AB	First Issue.

1:425,000
Scale @ A3

0 10 20 Km

Arecleoch Windfarm Extension

Scoping Report

Landscape Character

Drg No	00481.00049.6.1.1
Rev	B
Date	09/10/18
Figure	6.1

Datum: OSGB36
Projection: TM

Legend

- Site Boundary
- Indicative Turbine Layout
- 20km Buffer from Indicative Turbine Layout
- 45km Buffer from Indicative Turbine Layout
- Viewpoint Location
- National Scenic Area
- Wild Land
- Garden Designed Landscapes
- Dumfries and Galloway Regional Scenic Areas
- South Ayrshire Scenic Area
- South Lanarkshire Special Landscape Area
- East Ayrshire Sensitive Landscape Area
- Local Authority Boundary

Blade Tip ZTV (200m)

- Visibility of Proposed Wind Farm

NORTH AYRSHIRE
BUTE
SOUTH AYRSHIRE
EAST AYRSHIRE
SOUTH LANARKSHIRE
DUMFRIES AND GALLOWAY
AUCHINCRUIVE
ROZELLE (LA ROCHELLE)
DUMFRIES HOUSE
SKELDON HOUSE
SCOT'S MINING COMPANY HOUSE
CULZEAN CASTLE
BLAIRQUHAN
KILKERRAN
CRAIGENGILLAN
BARGANY
DRUMLANRIG CASTLE
MAXWELTON (GLENCAIRN CASTLE)
01. MERRICK
DALSWINTON
COWHILL TOWER
GLENAPP
LOCHRYAN
CASTLE KENNEDY
NITH ESTUARY
THREAVE GARDENS
FLEET VALLEY
CALLY
EAST STEWARTRY COAST
BROUGHTON HOUSE
ARDWELL HOUSE
LOGAN BOTANIC GARDEN
LOGAN HOUSE (BALZIELAND)
GALLOWAY HOUSE
MONREITH

Rev	Date	By	Comment
B	08/10/18	BB	Second Issue.
A	27/09/18	LM BB	First Issue.

1:400,000 Scale @ A3

0 10 20 Km

Arecleoch Windfarm Extension

Scoping Report

Blade Tip ZTV - Landscape Designations

Drg No	00481.00049.6.2.1
Rev	B
Date	09/10/18
Figure	6.2

Datum: OSGB36
Projection: TM

Legend

- Site Boundary
- Indicative Turbine Layout
- 20km Buffer from Indicative Turbine Layout
- 45km Buffer from Indicative Turbine Layout
- Viewpoint Location (1)

Blade Tip ZTV (200m)

- Visibility of Proposed Wind Farm

N

140000 160000 180000 200000 220000 240000 260000 280000

620000 600000 580000 560000 540000

Rev	Date	By	Comment
B	08/10/18	BB	Second Issue.
A	27/09/18	LM BB	First Issue.

SCOTTISHPOWER RENEWABLES

1:400,000 Scale @ A3

0 10 20 Km

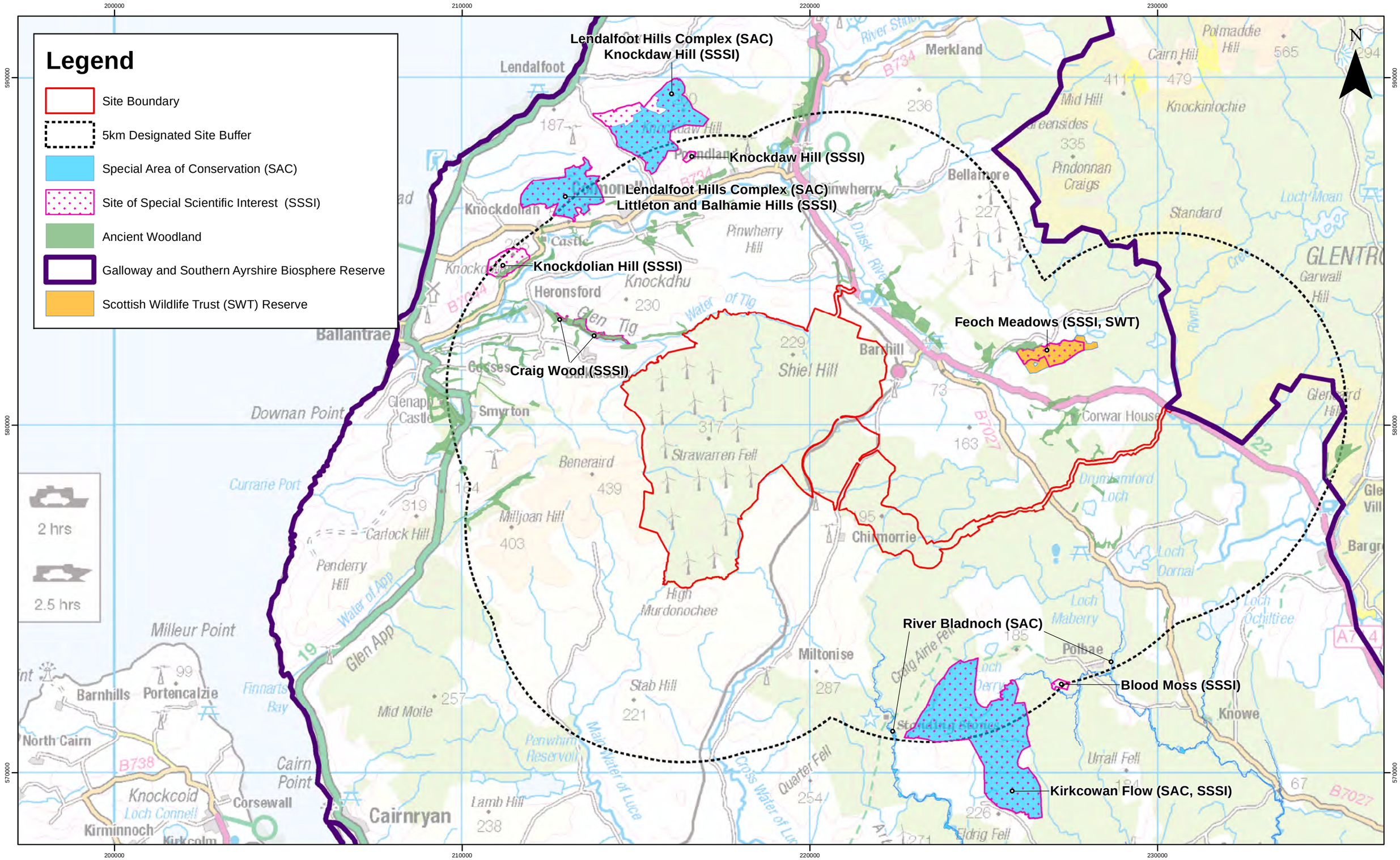
Arecleoch Windfarm Extension

Scoping Report

Blade Tip ZTV - Viewpoints

Drg No	00481.00049.6.3.1
Rev	B
Date	09/10/18
Figure	6.3

Datum: OSGB36
Projection: TM



Rev	Date	By	Comment
C	12/10/2018	BJF	Third Issue.
B	26/09/2018	BJF	Second Issue.
A	09/08/2018	BJF	First Issue.

1:100,000 Scale @ A3

0 2.5 5 Km

Arecleoch Windfarm Extension

Ecological (Non-Avian) Designated Sites Within 5km

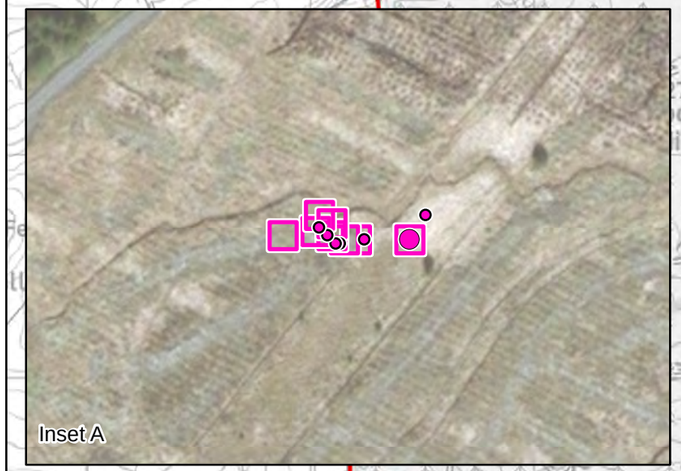
Drg No	E_ScopFig7.1_DS_AHE		
Rev	C	Datum:	OSGB36
Date	12/10/18	Projection:	TM
Figure	7.1		

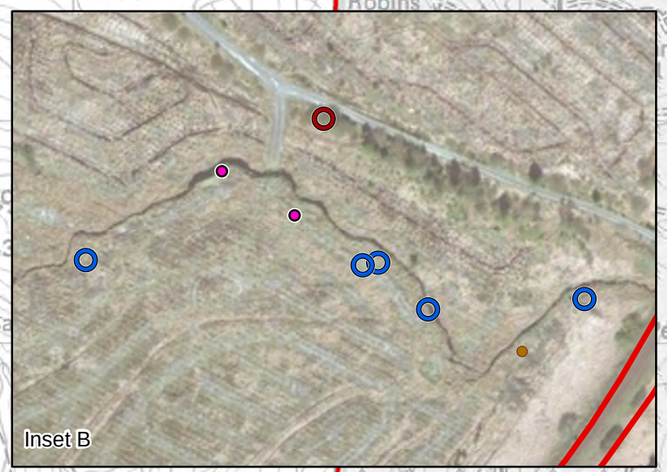
Legend

- Site Boundary
- Study Area

Species, Sign

- Badger, Footprint
- Otter, Spraint
- Otter, Resting site
- Pine Marten, Call
- Pine Marten, Call (Potential
- Pine Marten, Scat (Potential)
- Reptile, Sighting
- Reptile, Potential Hibernacula
- Squirrel, Sighting
- Squirrel, Feeding Signs
- Water Vole, Burrow
- Water Vole, Sighting
- Water Vole, Feeding Remains
- Water Vole, Latrine
- General, Mammal Hole
- General, Sighting
- Watercourse
- Watercourse Area





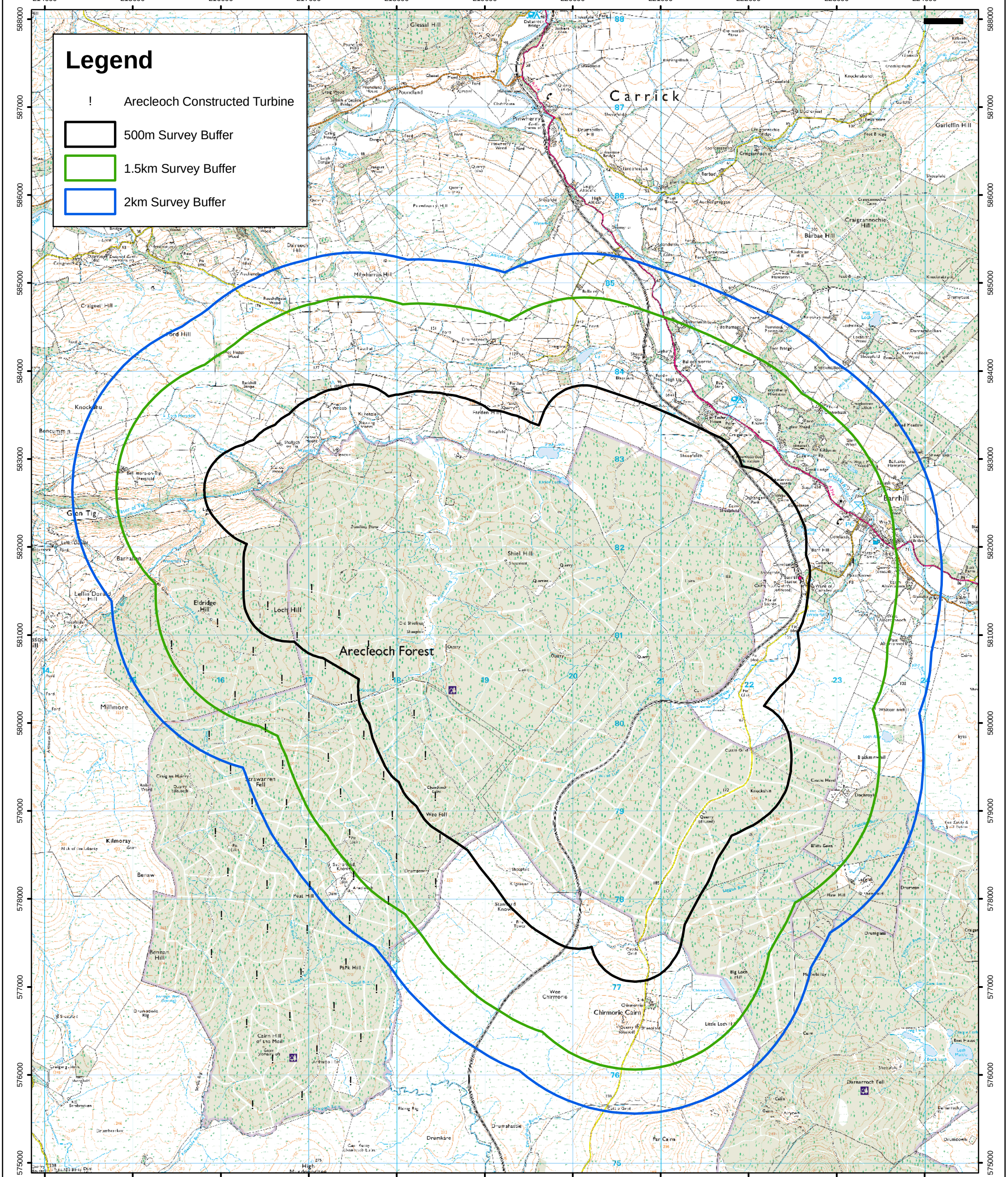
Rev	Date	By	Comment
C	12/10/2018	BJF	Third Issue.
B	26/09/2018	BJF	Second Issue.
A	09/08/2018	BJF	First Issue.

1:27,500
Scale @ A3

Arecleoch Windfarm Extension
Protected Species Survey Results

Drg No	E_ScopFig7.2_PS_2017_AHE
Rev	C
Date	12/10/18
Figure	7.2

Datum: OSGB36
Projection: TM



Arecleoch Windfarm Extension

Ornithology Survey buffers

1:40,000 Scale @ A3

0 0.25 0.5 1 Km

Rev	Date	By	Comment
1	09/10/18	DS	First Issue.

Figure	Date	Rev	Dwg No.	
8.1	09/10/18	2	000001	Datum: OSGB36 Projection:TM

Legend

!	Arecleoch Constructed Turbine
▭	500m Survey Buffer
#	Vantage Point Location

Arecleoch Forest

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		1:35,000 Scale @ A3	0 0.2 0.4 0.8 Km
1	09/10/18 DS First Issue.	**Figure** 8.2	**Date** 09/10/18 **Rev** 2 **Dwg No.** 000002 Datum: OSGB36 Projection:TM
Rev	**Date** **By** **Comment**		

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