

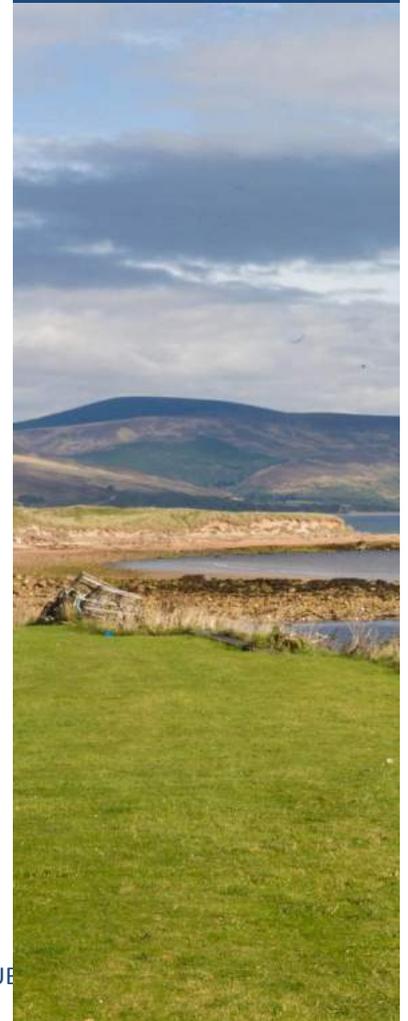
SCOPING REPORT

August 2017

CREAG DHUBH WIND FARM

CREAG DHUBH RENEWABLES LLP
Muirden, Turriff,
Aberdeenshire,
AB53 4NH

www.creagdhubhwindfarm.co.uk



DUE



Preface

This Scoping Report for a proposed wind farm at Creag Dhubh, near Strachur in Argyll and Bute, provides information on the proposal in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. The purpose of the report is to request that Argyll and Bute Council adopt a Scoping Opinion in relation to the proposal at Creag Dhubh.

The aims of this report are to:

- Provide a description and plan of the location of the development;
- Describe the nature and purpose of the development;
- Summarise the environmental baseline conditions of the site;
- Identify where there could be likely significant effects on the environment;
- Set out the approach to the Environmental Impact Assessment, including the proposed content of the EIA Report; and
- Allow for consultation of statutory and non-statutory consultees.

Document prepared by:

Angus Elder BSc (Hons) MSc AIEMA TechIOA

Contents

Preface	2
1 Introduction	5
1.1 Background.....	5
1.2 Legislation.....	5
1.3 Overall Approach to EIA	5
1.3.1 Scoping.....	5
1.3.2 Baseline Studies	5
1.3.3 Predicting and Assessing Impacts.....	5
1.3.4 Mitigation	6
2 Planning and Energy Policy Context.....	7
3 Project Description	9
3.1 Site Description	9
3.1.1 Location.....	9
3.2 The Proposed Development	9
3.2.1 Overview of the development	9
3.2.2 Turbine layout	9
3.2.3 Turbine Specification	10
3.2.4 Construction.....	10
3.2.5 Operation.....	11
3.2.6 Decommissioning.....	12
3.2.7 Shared Ownership.....	12
4 Scope of EIA Report	13
4.1 Introduction.....	13
4.2 Structure of the EIA Report	13
4.3 Landscape and Visual Assessment	13
4.3.1 Background.....	13
4.3.2 Guidance	13
4.3.3 Study Area.....	14
4.3.4 Proposed Methodology	14
4.3.5 Preliminary Baseline	15
4.3.6 Potential Mitigation Measures.....	18
4.4 Noise	18
4.4.1 Background.....	18
4.4.2 Proposed Methodology	19
4.4.3 Potential Mitigation Measures.....	21
4.5 Ecology and Ornithology	21
4.5.1 Background.....	21
4.5.2 Legislation and guidance.....	21
4.5.3 Preliminary Baseline	22
4.5.4 Proposed Methodology	24
4.5.5 Potential Mitigation Measures.....	25

4.6	Hydrology	25
4.6.1	Background.....	25
4.6.2	Guidance and legislation.....	25
4.6.3	Proposed Methodology	27
4.6.4	Preliminary Baseline	28
4.6.5	Potential Mitigation Measures.....	29
4.7	Cultural Heritage and Archaeology	30
4.7.1	Background.....	30
4.7.2	Proposed Methodology	31
4.7.3	Preliminary Baseline	31
4.7.4	Potential Mitigation Measures.....	32
4.8	Shadow Flicker.....	32
4.8.1	Background.....	32
4.8.2	Proposed Methodology	33
4.8.3	Preliminary Baseline	33
4.8.4	Potential Mitigation Measures.....	33
4.9	Cumulative Effect.....	33
4.9.1	Background.....	33
4.9.2	Proposed Methodology	33
4.9.3	Preliminary Baseline	34
4.9.4	Potential Mitigation Measures.....	34
4.10	Existing Infrastructure, Telecommunication Television, Aviation and Electromagnetic Safety	34
4.10.1	Background	34
4.10.2	Proposed Methodology	34
4.10.3	Preliminary Baseline	34
4.10.4	Potential Mitigation Measures.....	35
4.11	Other Issues	35
4.11.1	Socio-economic Effects	35
4.11.2	Traffic, Transport and Access.....	35
5	How to respond to the Scoping Report.....	36

1 Introduction

1.1 Background

Creag Dhubh Renewables LLP (hereinafter referred to as 'the Applicant') are looking at the opportunity to develop a wind farm at Creag Dhubh, near Strachur in Argyll and Bute. The exact number and generating capacity of the turbines is under consideration and will be influenced by the comprehensive technical and environmental studies being undertaken. However, it is considered that the wind farm will have a generating capacity of greater than 20MW. The wind farm will comprise wind turbines, access tracks, a substation, a temporary construction compound and possibly a borrow pit(s).

1.2 Legislation

As a 'Schedule 2 Development', it is expected that this project will require an Environmental Impact Assessment (EIA) following the adoption of a Screening Opinion by Argyll and Bute Council (ABC). This Scoping Report therefore forms part of a request from the Applicant to ABC to adopt both a Screening and Scoping Opinion under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

1.3 Overall Approach to EIA

A systematic approach to the EIA is being employed in accordance with EIA regulations, and as specified in Planning Circular 01/2017 (Scottish Government, 2017) and the Institute of Environmental Management and Assessment (IEMA): Guidelines for Environmental Impact Assessment (IEMA, 2004). The chosen approach will use the structure set out in the following sub-sections.

1.3.1 Scoping

The initial scoping process of the EIA aims to establish the likely significant effects relevant to the proposed development. This document therefore aims to provide information on the type of potential environmental effects that may arise because of the proposed development. This information will facilitate consultation with statutory and non-statutory consultees to allow for agreement on the most appropriate methods of assessment. The process will follow the guidelines set out by The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

1.3.2 Baseline Studies

Information on the baseline environmental conditions of the site and part of the surrounding area will be gathered to assess the sensitivity of the environment to the proposal. This information will be gathered from a variety of sources, including existing data records and preliminary or extensive field studies that are discussed in Sections 3 and 4 of this report.

1.3.3 Predicting and Assessing Impacts

The baseline studies provide the foundation for predicting and assessing effects that may result from the proposal. The source, pathways and receptor of an effect(s) will be considered over a variety of timescales. These effects may be positive, as well as negative, and will be identified during the construction, operation and decommissioning phases of the project. In addition, it may be appropriate to predict and assess any cumulative effects of projects of a similar type within the wider context. To ensure a comprehensive assessment, a variety of qualitative and quantitative methods will be employed and evaluated against topic specific criteria explained in Section 4.

1.3.4 Mitigation

Through the evolution of an iterative design process, the project design will be founded on site-specific constraints and this will therefore prevent the requirement for mitigation measures in many cases. The design process will be reported in the EIA Report and any necessary or additional mitigation measures and residual effects identified.

2 Planning and Energy Policy Context

The Applicant is seeking planning permission from ABC under the Town and Country Planning Act (Scotland) 1997. An application for the development of a wind energy project in Scotland should be assessed in the context of planning policy guidance contained within National, Structural and Local Development Plans. This body of information is contained within a wide range of documents.

The following summary contains relevant guidance and policies, which this project should accord.

1. National Planning Policy, Advice Notes and Guidance:

- **Scottish Planning Policy (SPP, 2014);**

SPP was published on 23 June 2014. The purpose of SPP is to set out national planning policies which reflect Scottish Government Ministers' priorities for the operation of the planning system, and for the development and use of land. SPP is a statement of Scottish Government policy on how nationally important land use planning matters should be addressed.

- **Scotland's National Planning Framework 3 (NPF3, 2014);**

The National Planning Framework 3 (NPF3) was published on 23 June 2014. NPF3 is a long term strategy for Scotland and is the spatial expression of the Government's Economic Strategy and plans for development and investment in infrastructure. Together, NPF3 and Scottish Planning Policy (2014) (SPP), applied at the strategic and local levels, are intended to help the planning system deliver the Scottish Government's vision and outcomes for Scotland and to contribute to the Government's central purpose.

- **Online Renewables Guidance (Scottish Government, 2014);**

The Scottish Government's online renewables guidance is dated May 2014 and it is currently under review to bring it in line with SPP. No conflict is identified with the national online guidance.

- **SPP – Some Questions Answered (Scottish Government, 2014); and**

The Scottish Government's online renewables guidance is dated May 2014 and it is currently under review to bring it in line with SPP. No conflict is identified with the national online guidance.

- **Spatial Planning for Onshore Wind Turbines – Natural Heritage Considerations – Guidance (Scottish Natural Heritage, 2015)**

SNH published a new document on the topic of spatial planning in June 2015 entitled 'Spatial Planning for onshore Wind Turbines – Natural Heritage Considerations – Guidance'. The document replaces the SNH 'Strategic Locational Guidance' for onshore wind farms. The guidance also makes the links between the SPP section on onshore wind (paras 161-172) and other parts of the policy which relate to natural heritage.

2. Local Planning Policy and Guidance:

- **Argyll and Bute Local Development Plan (2015)**

The Argyll and Bute Local Development Plan was adopted in March 2015 and sets out how the Council wants the area to develop to 2024 and beyond.

Policy LDP 6 is of particular relevance to this proposal and states:

'The Council will support renewable energy developments where these are consistent with the principles of sustainable development and it can be adequately demonstrated that there would be no unacceptable significant adverse effects, whether individual or cumulative, including on

local communities, natural and historic environments, landscape character and visual amenity, and that the proposals would be compatible with adjacent land uses.'

The policy also refers to the spatial framework, prepared as Supplementary Guidance, which will identify areas with potential for wind farm development, as well as areas that have significant protection and areas where wind farms are not acceptable.

Other policies that are relevant to the proposal include:

- Policy Policy LDP Strat 1– Sustainable Development;
- Policy LDP 3 – Supporting the Protection, Conservation and Enhancement of Our Environment;
- Policy LDP5 – Supporting the Sustainable Growth of Our Economy;
- Policy LDP 9 – Development Setting, Layout and Design;
- Policy LDP 10 – Maximising our Resources and Reducing Our Consumption;
- Policy LDP 11 – Improving our Connectivity and Infrastructure.

Argyll and Bute Council has issued the following supplementary planning guidance and policy interpretation documents:

- **Argyll and Bute Local Development Plan: Supplementary Guidance (2016)**

The Supplementary Guidance provides an explanation of policy objectives and provides guidance on how to undertake policy tests, where possible. The Supplementary Guidance also contains a Spatial Framework for all wind turbines where the blade tip exceeds 50 metres in height. The proposed site is categorised as 'Group 3', which indicates an 'area where wind farms are likely to be acceptable'.

- **Renewable Energy Action Plan (2017)**

The action plan has been developed to help Argyll and Bute realise its vision for the development of the renewable energy sector

3 Project Description

3.1 Site Description

3.1.1 Location

The site is located in Argyll and Bute, situated over 1km to the northeast of the village of Strachur, with the proposed wind turbines located approximately 3km from the village. The location of the site is shown in Figure 1 of the appended maps.

The wind farm would be located on the slopes of Creag Dhubh, 484m AOD at its summit, and partially below Creag an t-Suidheachain, in an area of commercial forestry and open moorland. There are several waterbodies within close proximity of the proposed turbine locations that drain the site to the River Cur, with the most notable entitled the Allt Mor.

The site is located approximately 10km south of the operational Clachan Flats wind farm.

3.2 The Proposed Development

3.2.1 Overview of the development

The main components of the proposed Creag Dhubh wind farm comprise:

- 9 turbines up to 139m to blade tip and each with a rated output of at least 3MW, giving a total generating capacity of at least 27MW;
- 9 crane hardstandings;
- Permanent access tracks;
- Electrical and communication underground cables running along most of the access track;
- A substation and control building;
- Possible on-site borrow pits.

In addition to these components that will be present for the life of the development there will be:

- A temporary construction compound with storage facilities and welfare facilities.

3.2.2 Turbine layout

The current plans for the proposed development consists of 9 wind turbines. The site layout is shown in Figure 2 of the appended maps.

Preliminary turbine coordinates are tabulated below.

Table 1 Wind turbine co-ordinates

Turbine Number	Easting	Northing
T1	212435	702435
T2	212718	703187
T3	212841	703655
T4	213061	704008
T5	213316	704336
T6	213550	704642
T7	213835	704931
T8	214227	705069
T9	214614	705198

3.2.3 Turbine Specification

The number of turbines to be proposed on the site will be determined through an iterative design process, which will be informed by the EIA. The turbine model will be subject to a tendering process; however, at this stage the candidate turbine is the Enercon E82 model. This turbine model will be used as a basis for the EIA.

3.2.3.1 Turbine geometry

It is likely that the proposed wind turbines will utilise a range of tower heights to reduce landscape and visual impacts and improve energy yields. The proposed turbine specifications are provided below:

Blade Number:	3
Rotor Diameter:	82m
Hub Height:	Circa. 69m-98m
Blade Tip Height:	Circa. 110m-139m
Rated Power:	3MW

3.2.3.2 Turbine colour

Where parts or entire wind turbines are likely to be viewed from sensitive viewpoints against a landform backdrop, it is considered that the choice of turbine colour is important. The wind farm design process, which will be informed by the landscape and visual assessment, will consider the precise colour tone that should be selected for the wind turbines. The choice of colour will consider the advice provided in SNH's 'Siting and Designing Wind Farms in the Landscape' (2017). It is possible that visualisations could be provided as part of the planning application illustrating the different colour options.

3.2.4 Construction

Construction of the proposed wind turbines is estimated to take place over a period of 9-12 months. However, the duration of the construction period may potentially be altered due to the final details of the scheme, weather or ground conditions at the site.

The wind farm construction is effectively split into two separate phases:

Phase 1

- Site survey and preparation;
- Remedial works;
- Construction of the wind turbine harstanding, foundations and access tracks;
- Excavation of the cable trenches and electricity and communication cable laying; and
- Construction of control housing.

Phase 2

- Delivery and erection of turbines;
- Testing and commissioning of wind turbines; and
- Site restoration.

Where possible a number of the construction processes will occur simultaneously in order to minimise the length of the construction programme. Full details of each stage will be described in the EIA Report.

3.2.4.1 Access Tracks

It is currently proposed that access to the site will utilise an existing access track from Strachurmore to the southwest of the site, which joins the A815 to the southeast of Strachur. The existing tracks would require to be improved so that they comply with the specifications detailed in the EIA Report. The principles that will be adhered to during construction will also be detailed in the EIA Report. New access tracks would be constructed to extend from the existing track to reach the turbine locations. The new tracks will form a 4m wide track resurfaced using hard-core with bell mouths where necessary.

3.2.4.2 Turbine Foundations

The design specification for the foundation of the turbines would depend on the following factors:

- Site geology;
- Turbine location;
- Turbine manufacturer and type; and
- Turbine manufacturer's foundation stiffness criteria.

By carrying out a study of these factors, it will be possible to determine the feasibility of the proposed location of the turbines and the need to microsite.

An area of hardstanding will be required to support the cranes used for the erection of the wind turbines.

3.2.4.3 Construction Traffic

The components of the proposed wind turbines will be transported to the site on articulated lorries. The articulated lorries would have extended trailers in order to deliver the turbine blades. Each turbine delivery is expected to be undertaken in 10 articulated low loader deliveries: one for the nacelle, three for the blades, five for the tower, and one for the generator/controller.

The proposed route and number of deliveries required for the duration of the construction period will be detailed in the EIA Report and is dependent on the final proposed turbine model and numbers. However, it is currently envisaged that the access route to the site will use the public road network from King George V Port in Glasgow. An abnormal indivisible load assessment will be undertaken to determine whether any upgrades will be required to the existing road network. Swept path analysis for any pinch points along the route will be provided in the EIA Report.

3.2.4.4 Grid Connection

Grid connection studies with SSE and National Grid are currently being undertaken to evaluate the most appropriate method of grid connection at the site. It is envisaged that the connection would be made by underground cable. Trenches would be created for the cabling and an on-site substation building will be required. The final location of the substation building is still being considered with input from SSE. The building will contain the main high voltage electrical switchgear and will be constructed out of conventional building materials with a finish colour to be agreed with ABC. Domestic wiring from the wind farm circuit will be used to provide all necessary heating and lighting associated with the building. Features within the substation building will include the computer base for controlling and monitoring the wind turbines.

3.2.5 Operation

Dependent on the final proposed turbine model, the details of operation may vary. The candidate Enercon wind turbines would begin generating electricity when wind levels reach approximately 2.5

m/s and they would cut-out as a result of Enercon Storm Control at wind speeds between 28-34 m/s. The turbine would reach its maximum output at a wind speed of approximately 17 m/s and would continue to generate at the rated output until the cut-out wind speed is experienced.

3.2.6 Decommissioning

The operational lifespan of the proposed turbines is 25 years, after which decommissioning would occur if the turbines were to cease operation. Details and/or conditions of decommissioning would be agreed with Argyll and Bute Council prior to consent being granted.

3.2.7 Shared Ownership

The Applicant is providing an opportunity for shared ownership of the proposal with local communities, and welcomes discussions at these early stages of the project's development. The approach to shared ownership will follow the Government's guidance on 'Good Practice Principles for Shared Ownership'. Contact details for the Applicant are provided in Section 5 of this report for interested parties.

4 Scope of EIA Report

4.1 Introduction

This section presents the relevant background and proposed methodology that will form the basis of the environmental assessment. Preliminary studies have been undertaken to identify the baseline of the proposed site and identify any areas that require further consideration within the EIA Report. The proposed methodology is provided and any potential mitigation measures identified.

4.2 Structure of the EIA Report

Table 2 outlines the chapters that will be included within the EIA Report. The list of chapters may be refined throughout the EIA process.

Table 2 EIA Chapters

Chapter	Title
1	Introduction
2	EIA Process and Methodology
3	Planning Policy
4	Site Selection, Design Process and Alternatives
5	Project Description
6	Climate Change and Carbon Emissions
7	Landscape and Visual
8	Noise
9	Shadow Flicker
10	Ecology
11	Protected Mammals
12	Ornithology
13	Hydrology, Hydrogeology and Soils
14	Cultural Heritage
15	Access, Transport and Traffic
16	Socio-economics
17	Communications Infrastructure and Electromagnetic Interference
18	Mitigation

4.3 Landscape and Visual Assessment

4.3.1 Background

The landscape assessment will consider the effects of the proposal on existing areas of landscape character, patterns and elements within or close to the site. The visual assessment will consider the effects of the proposal on the views and the overall effect on visual amenity within the study area. Visual effects are of key concern to any wind turbine development.

4.3.2 Guidance

- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Landscape Institute and Institute of Environmental Management and Assessment, 2013;
- Visual Assessment of Wind Farms: Best Practice, University of Newcastle, Scottish Natural Heritage Report No. F01AA303A, 2002;

- Landscape Character Assessment: Guidance for England and Scotland, The Countryside Agency and SNH, 2002;
- Siting and Designing Windfarms in the Landscape, Scottish Natural Heritage, 2017;
- Assessing the Cumulative Impact of Onshore Wind Energy Developments, Scottish Natural Heritage, 2012;
- Constructed tracks in the Scottish Uplands, Scottish Natural Heritage. Land Use Consultants, 2005;
- Good practice during windfarm construction. Scottish Renewables, Scottish Natural Heritage, Scottish Environmental Protection Agency and Forestry Commission Scotland, 2015;
- Wildness in Scotland's Countryside, Scottish Natural Heritage, 2002;
- Draft guidance: 'Assessing impacts on Wild Land Areas – technical guidance', 2017;
- Description of Wild Land Area – Final Report to SNH from Consultants, Caroline Stanton Landscape Architect and Buchan Landscape Architecture, 2015;
- Visual Representation of Windfarms: Good Practice Guidance, Scottish Natural Heritage, 2017;
- Photography and photomontage in landscape and visual impact assessment – Advice Note, Landscape Institute, 2011;
- The Landscapes of Scotland, Scottish Natural Heritage, 2012;
- Landscape assessment of Argyll and the Firth of Clyde, Scottish Natural Heritage, 1996;
- Loch Lomond and The Trossachs National Park Landscape Character Assessment, Scottish Natural Heritage, 2009;
- The Special Landscape Qualities of the Loch Lomond and The Trossachs National Park, Scottish Natural Heritage and Loch Lomond and The Trossachs National Park Authority, 2010;
- Argyll and Bute Landscape Wind Energy Capacity Study, Argyll and Bute Council and Scottish Natural Heritage, 2012.

4.3.3 Study Area

A 35km radius study area has been chosen in accordance with SNH guidance as the basis for the landscape and visual assessment. An initial 60km radius study area has been chosen for the cumulative landscape and visual assessment.

4.3.4 Proposed Methodology

The overall aims of the study will be to:

- Outline the assessment criteria and the significance thresholds, using established guidance and professional judgement;
- Describe and evaluate the existing landscape character of the site and the 35km study area, including designated landscapes, in particular the Loch Lomond and The Trossachs National Park and Areas of Panoramic Quality, in order to understand its susceptibility to change and value;
- List and illustrate on a basemap the existing, consented and proposed onshore and offshore wind developments within 60km, as well as those projects undertaking scoping;
- Illustrate the nature of effects using ZTV maps, photomontages and wirelines
- Describe the views of the proposed development from viewpoints selected by the scoping studies with input from Argyll and Bute Council, Scottish Natural Heritage and local Community Councils (see initial list in 4.3.5.3);

- Identify the potential landscape and visual effects of the proposed development on the landscape character and visual amenity of the surrounding area;
- If necessary, undertake an assessment of potential effects to key attributes and perceptual responses associated with particular Wild Land Areas in the study area (methodology to be agreed with SNH);
- Assess the visual and cumulative effects on local settlements;
- Assess within the LVIA the visual effects to users of key transport and recreational routes (e.g. Cowal Way);
- Identify and assess the cumulative effects introduced together with other wind farms that are existing, consented and currently in the planning system;
- Assess whether effects are significant and outline the residual effects;
- Identify the scope of any potential mitigation measures that will help avoid or limit potential effects.

Additionally, as the landscape and visual assessment progresses it will inform the wind farm size and design process throughout the pre-application stages.

4.3.5 Preliminary Baseline

4.3.5.1 Landscape Character

The Cowal and Bute landscape is described in SNH's descriptions of 'The Landscapes of Scotland' (2015):

'A picturesque area of well-wooded, steeply sloping hills and ridges which enclose a series of sea lochs. The long, low island of Bute nestles against the coast at the narrow Kyles of Bute. The interplay of land and sea occurs on an intimate scale, but there are also panoramic views of the Firth of Clyde, Kintyre and Argyll. Roads link the occasional settlements along the coastline and there are some larger estates on the flatter ground. Although only a short distance by ferry, the circuitous nature of landward journeys gives the area a feeling of being remote. It is possible to experience peace and quiet, especially in the area's many castles, gardens and walks, despite the proximity to large populations and the presence of major naval facilities, golf courses and holiday resorts.'

The proposed wind farm is partially situated in an area of 'Forested Glen' landscape character type (LCT) and an area of 'Open Upland Hills' LCT in Cowal and Bute, according to Scottish Natural Heritage's Landscape Character Assessment dataset. However, the site area is not included in one of SNH's landscape character assessments (it is excluded from the Argyll and Firth of Clyde and Loch Lomond and The Trossachs LCAs). As part of SNH's response to this Scoping request, it is therefore requested that the omission of this area from assessment is confirmed and any additional relevant guidance provided to the applicant.

The Argyll and Bute Landscape Wind Energy Capacity Study categorises the broader area surrounding the site as 'Steep Ridgeland & Mountains'. The capacity study provides a summary of the sensitivity, cumulative issues, constraints and opportunities for development within the landscape character type. The LVIA will consider the analysis provided in the capacity study and it will inform the design of the wind farm. At this preliminary stage, it is considered that the site's location provides an opportunity to design a small wind farm that would limit significant effects to key sensitivity criteria.

4.3.5.2 Landscape Designations

Areas of Panoramic Quality

Argyll and Bute Council has designated areas of regional importance in terms of their landscape quality, which are referred to in the local development plan as Areas of Panoramic Quality. One of the proposed wind turbines is located in the North Argyll Area of Panoramic Quality and the other wind turbines are located in close proximity to the border of this designated area. The North Argyll Area of Panoramic Quality extends over 40km to the north of the proposal and covers an area of 698 square

kilometres. There is no citation detailing the special qualities of this Area of Panoramic Quality; however, an assessment of effects to the area's key sensitivities will be undertaken as part of the LVIA.

The West Loch Fyne (Coast) and East Loch Fyne (Coast) Areas of Panoramic Quality are located approximately 2km and 5km from the proposal and are also predicted to experience partial theoretical visibility of the current proposal. An assessment of effects to the two areas key sensitivities will be undertaken as part of the LVIA.

National Parks

The Loch Lomond and The Trossachs National Park is located slightly over 1km to the east of the nearest proposed wind turbine. The National Park is nationally protected by the National Parks (Scotland) Act 2000 and was designated in 2002. Scottish Natural Heritage have identified the special qualities of the National Park's landscape, which will enable an assessment of landscape and visual effects to its special qualities to be undertaken. An assessment of the special qualities of the Loch Lomond and The Trossachs National Park, in particular the 'Argyll Forest' landscape area, will therefore be included as part of the LVIA.

Wild Land Areas

There are four Wild Land Areas in the study area. The closest Wild Land Area (WLA) to the proposal is the 'Ben Lui' WLA, which is situated approximately 11km to the north of the proposed wind turbine locations. The 'Ben More – Ben Ledi', 'Loch Etive mountains' and 'Breadalbane – Schiehallion' WLAs are also situated approximately 19km, 23km and 32km from the proposal respectively.

Where potentially significant effects are predicted, the sensitivities of the WLAs will be assessed in accordance with the latest guidance that is available from SNH (currently the draft document 'Assessing impacts on Wild Land Areas – technical guidance' (2017)). The proposed methodology for the assessment will be provided to SNH to enable comment prior to work being undertaken.

Gardens and Designed Landscapes

The closest designated Garden and Designed Landscape is located at Ardkinglas and Strone, approximately 3km from the proposal at its closest reaches. The designed landscape at Ardkinglas and Strone is of outstanding horticultural interest for its woodland garden collections. It provides the setting for Robert Lorimer's Ardkinglas House and was valued as a work of art in its own right by 18th-19th century tourists and travellers to the Highlands. It is predicted that there would be no visibility of the current wind farm proposal and therefore no assessment of effects to the landscape will be undertaken.

The Garden and Designed Landscape of Inverary Castle is approximately 4km from the proposal at its closest reaches. Inverary is a designed estate landscape with castle focal point incorporating an 18th-century improvement landscape (parklands, garden buildings and vast woodland plantations) and planned town. The designed landscape covers an area of 1851 hectares, with some areas predicted to receive theoretical visibility of the wind farm. An assessment of effects to the landscape will be included in the LVIA.

Within the study area, one further Garden and Designed Landscape is predicted to receive theoretical visibility of the wind farm: Crarae. A Himalayan-style woodland garden containing many rare and unusual plants, Crarae is also notable for its forestry planting, displaying the shape and growth habits of many interesting trees. An assessment of effects to the landscape will be included in the LVIA.

A number of other Gardens and Designed Landscapes are located within the proposed study area; however, they are not predicted to receive theoretical visibility of the proposed wind farm in its current form.

4.3.5.3 Visual Receptors

A blade tip Zone of Theoretical Visibility (ZTV) (see Figure 4) shows the predicted visibility of the proposed wind farm to 35km when no screening from the built or natural environment is taken into consideration. ZTVs have informed the scope for the viewpoint assessments, with viewpoint locations to be agreed with Argyll and Bute, SNH and Community Council/s.

Table 3 shows a number of settlements and their predicted visibility of the proposed turbines tips as informed by the ZTV.

Table 3 Closest settlements and the predicted theoretical visibility of the proposal

Settlement	Distance from Site	Predicted Theoretical Visibility
Strachur	3km	None
Inverary	5km	Blade tips theoretically visible and 1-2 hubs theoretically visible in some areas to the west of The Avenue.
Lochgoilhead	7km	None
Furnace	10km	Extremely limited theoretical visibility of 1-4 hubs and blade tips
Arrochar	15km	None
Garelochhead	16km	None
Dalmally	22km	None
Helensburgh	25km	None
Dunoon	27km	None
Greenock	28km	None
Gourock	29km	None
Taynuilt	29km	None
Kilmelford	30km	None
Lochgilphead	30km	None
Crianlarich	32km	None
Alexandria	34km	None

In addition to the small number of settlements identified in Table 3, a number of individual homes, farms and hamlets may experience visibility of the wind farm.

It is proposed that in order to confirm the findings of the ZTV and to aid landscape and visual assessment, viewpoint locations will be agreed with ABC and SNH. The following viewpoints in Table 4 are proposed, and are shown in Figure 5.

Table 4 Proposed viewpoints

Viewpoint		Easting	Northing	Distance (km)	Description
VP1	Cowal Way	210932	701225	2.2km	Taken from a section of the Cowal Way unaffected by woodland screening. Representative of views received by recreational users of the Cowal Way and the Core Path.
VP2	A815	210171	700008	3.7km	Taken from a section of the A815 between Strachur and Glenbranter on the boundary of the Loch Lomond and The Trossachs National Park. Representative of views received by road users.

VP3	Inverary (Front Street East)	209697	708503	5.4km	Taken from the car park at the shore of Loch Fyne. Representative of views received by local residents, workers and tourists.
VP4	Beinn Bheula	215403	698270	5.5km	Taken from summit of Beinn Bheula in the Loch Lomond and The Trossachs National Park. Representative of views received by recreational users of the National Park.
VP5	Inverary Castle	209582	709227	6.1km	Taken from lawn in front of south west façade of the castle in the West Loch Fyne (Coast) Area of Panoramic Quality. Representative of views received by tourists.
VP6	Ben Donich	221844	704302	7.3km	Taken from the summit of Ben Donich in the Loch Lomond and The Trossachs National Park. Representative of views received by recreational users of the National Park.
VP7	Newton	204344	698416	9.2km	Taken from the edge of the hamlet in the East Loch Fyne (Coast) Area of Panoramic Quality. Representative of views received by local residents.
VP8	Ben Arthur	226138	706036	11.6km	Taken from the northern summit of Ben Arthur. Representative of views received by recreational users of the National Park.
VP9	A83 (Minard)	197820	696196	16.1km	Taken from the A83 road in the village of Minard, which is located in the West Loch Fyne (Coast) Area of Panoramic Quality. Representative of views received by road users and tourists.
VP10	Ben Lui	226637	726281	24.3km	Taken from the summit of Ben Lui. Representative of views received by recreational users of the Loch Lomond and The Trossachs National Park.
VP11	Ben Cruachan	206963	730410	26.3km	Taken from the summit of Ben Cruachan in the North Argyll Area of Panoramic Quality. Representative of views received by recreational users.

4.3.6 Potential Mitigation Measures

The assessments proposed in this scoping report will inform the site layout through an iterative design process and detailed micro siting of the turbines. Using guidelines from SNH's 'Siting and Designing Windfarms in the Landscape' it is anticipated that to minimise visual and landscape impacts resulting from the wind farm, a variety of turbine tower heights will be considered to create a visual structure sensitive to the landscape. Various stages of the design process will include consultation with Argyll and Bute Council to reach an optimum site layout that would have the minimum impact to the surrounding area.

Several measures will be undertaken to reduce the landscape and visual impact during construction of the wind farm. It is anticipated that the following mitigation methods would be undertaken:

- Temporary storage of materials and required security fencing will be sensitively located;
- Designated routes will be followed by construction vehicles to transport loads around the site;
- Contractors will be required to show relevant methodologies when working close by to significant landscape resources.

4.4 Noise

4.4.1 Background

This section will consider the potential noise impacts and effects associated with the operation and construction of the proposal. Noise can have an effect on the environment and on the quality of life enjoyed by individuals and communities. The impact of noise can therefore be a material consideration

in the determination of planning applications. Noise impacts can arise from three distinct areas of the wind farm's development:

- The construction of the wind farm;
- During the operation of the wind farm; and
- Resulting from increased traffic flow during the construction and operation stages.

4.4.2 Proposed Methodology

4.4.2.1 Guidance

Guidance for assessing operational and construction noise from wind turbines is given in:

- 'ETSU-R-97: the Assessment and Rating of Noise from Wind Farms' (1997), The Department of Trade and Industry (usually referred to as the Noise Working Group Recommendations).
- 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' Institute of Acoustics (May, 2013)
- BS5228:2009 Code of practice for noise and vibration control on construction and open sites

4.4.2.2 Construction Noise Assessment

Noise sensitive receptors surrounding the site should be protected from the potential noise and vibration associated with the construction of wind turbines and as such; the noise levels of various construction activities will be assessed. Noise levels will be assessed against acceptable limits so that they do not affect the amenity of residential properties surrounding the site. It is anticipated that the construction of the access tracks, the excavation of foundations, the turbine foundation build and turbine erection will make up the basis of the construction noise assessment. The construction noise assessment methodology will be carried out in accordance with the British Standard BS 5228-1:2009 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise'.

4.4.2.3 Operational Noise Assessment

The site is situated in a reasonably remote area and therefore it is expected that there will be few dominant noise sources, whilst the nearest noise sensitive receptor (Succothmore) is located over 1km from the closest proposed wind turbine.

Assessment Methodology

Consultation

Consultation will be carried out with ABC to establish the requirements of the assessment in relation to baseline noise monitoring and cumulative noise considerations.

Propagation Model

In accordance with recommendations made in 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (GPG), the propagation method used in this assessment is 'The General Calculation Method' of the International Standard ISO9613-2. The ISO9613-2 Standard allows noise levels to be predicted for short-term downwind conditions (i.e. wind blowing from the proposed turbines towards the noise sensitive receptors). This method therefore presents a worst-case scenario as all receptors will not be downwind of the turbines at the same time. Noise levels would therefore be significantly reduced in reality when the wind is blowing in the opposite direction.

The ISO9613-2 propagation model takes into account reduction in noise due to distance, atmospheric absorption, screening effects (if present) and other miscellaneous noise losses. Importantly, noise levels can be increased or reduced by the interaction of sound waves with the ground. Sound pressure levels at specific locations can be measured in octave frequency bands by subtracting several attenuation factors.

The noise level in each octave band can be represented by the following equation:

$$\text{Predicted Noise Level } L_{90} = L_{W(\text{eq})} - \text{Attenuation factors } (A_{\text{div}} + A_{\text{atm}} + A_{\text{gr}} + A_{\text{bar}} + A_{\text{misc}}) - 2\text{dB}$$

Where A_{div} is geometrical divergence, A_{atm} is atmospheric absorption, A_{gr} is ground effect, A_{bar} is the effects of barriers and A_{misc} is miscellaneous other effects.

It is also stated that windfarm $L_{A90,10\text{min}}$ values are typically 1.5dB to 2.5dB lower than $L_{A\text{eq},10\text{min}}$ and therefore they can be converted to their $L_{A90,10\text{min}}$ values by subtracting 2dB, so this also accounted for in the equation.

The ISO9613-2 model inputs will be specified with the following included in the methodology:

1- The turbine sound power levels used as input.

Expressed in decibels to a reference sound power of one picowatt (1 pW).

2- The atmospheric conditions assumed.

An atmospheric attenuation coefficient should be used that depends strongly on the frequency of the sound, the ambient temperature and the relative humidity of the air. Values should be based on the average ambient weather of the locality.

3- The ground factors G_s , G_m , G_r assumed.

An attenuation value representative of local ground surface, which takes into account the different effects of sound, reflected on varying surfaces should be utilised. Hard ground, including all surfaces with a low porosity (e.g. paving, water and concrete), should be given the value $G=0$. Porous ground, including ground covered by grass or other vegetation or ground suitable for farming, according to the International Standard ISO 9613-2 would have a value $G=1$.

4- The effects of barriers.

Barrier attenuation should generally not be used within wind turbine calculations using ISO 9613-2, unless there is no line of sight between the receptor and the highest point of the rotor. Where there is no line of sight a 2dB barrier attenuation can be assumed. A higher barrier attenuation of more than 2dB should be fully justified.

Baseline noise surveys

Background noise measurement surveys will be conducted in accordance with ETSU-R-97 and the more recent IOA (2013) good practice guide. The surveys will incorporate long-term measurements of at least two weeks at noise sensitive receptors. The number and the locations of the noise meters will be agreed with ABC prior to carrying out the surveys. The measurements will comprise of 10-minute noise measurements correlated to 10-minute wind speed and rain level measurements over a range of wind speeds between 3-12m/s. Wind speeds will be normalised to a height of 10m above ground level using the data recorded on an onsite meteorological mast or sodar/lidar. If a met mast is proposed to record wind measurements then planning permission would be obtained from ABC prior to its erection.

An assessment of independent and cumulative wind turbine noise levels against background noise levels will then be carried out to identify the level of effects to noise sensitive receptors.

Submissions

The following information will be submitted as part of the operational noise assessment:

- 1:10,000 base map of the proposed wind farm turbine locations, neighbouring wind turbine developments and noise sensitive receptors (including distance from nearest turbine);
- Make, model and hub height of proposed wind turbine model;
- The sound power levels of the proposed wind turbines and neighbouring wind turbines, including manufacturer warranties;
- Assessment results displayed as both tabulated data and in the form of noise contour plots that show the noise emissions of the wind turbines in relation to noise sensitive receptors.

4.4.3 Potential Mitigation Measures

During the construction period, the following measures would be undertaken to reduce noise levels:

- Construction activities carried out on site will adhere to best practice guidance presented by BS 5228
- Activities that may give rise to noise at noise sensitive receptors will be limited to periods between 07.00 and 19.00 on Monday to Fridays and 07:00 and 13:00 on Saturdays. The only exception to this measure would be for the delivery of the turbines and exceptional loads, which only occur with prior consent of the Council and the Police.
- If possible, activities will be separated from residential properties by the maximum distance possible.
- Construction equipment will be maintained in good working order and any associated noise attenuation, such as engine casing and exhaust silencers, will not be removed at any time.
- Plant will be selected with consideration to their noise emissions and their cumulative effects.

4.5 Ecology and Ornithology

4.5.1 Background

This section will consider the potential effects of the proposed wind farm on the nature conservation interests within and around the site, and sets out a scope of work required to assess these effects. Ecological consultants from Neo Environmental have been commissioned by the Applicant to undertake the required surveys and assessment.

Neo Environmental initially consulted Liz Pryor at SNH to agree on the scope of the survey effort in November 2016. It was considered that the efforts proposed at that time were reasonable, and the importance of following the latest guidance was highlighted to ensure that future submissions are assessed in a timely manner.

4.5.2 Legislation and guidance

Relevant wildlife legislation and guidance will be considered in the EIA Report to inform the overall assessment methodology and will include the following:

- EU Habitats Directive (Annex I, II, IV);
- EU Birds Directive (Annex I, II);

- The Conservation (Natural Habitats, &c.) Regulations 1994;
- Bonn Convention;
- Wildlife & Countryside Act 1981 (Schedules 1, 5, 8, 9) (as amended by the Nature Conservation (Scotland) Act 2004);
- Protection of Badgers Act 1992;
- Guidelines for Ecological Impact Assessment, (Institute of Ecology and Environmental Management, 2006);
- Preparation of Environmental Statements for Planning Projects that Require Environmental Assessment: A Good Practice Guide;
- Guidelines for Selection of Biological SSSI's (Nature Conservancy Council (1989), and as updated by Joint Nature Conservancy Committee (JNCC));
- Local and National Biodiversity Action Plans.

4.5.3 Preliminary Baseline

4.5.3.1 Nature Conservation Designations

Within 20km of the proposed wind farm, there are sites with international and national ecological and ornithological designations. The initial desk-based assessment has identified eight SACs, five SPAs and one RAMSAR site within 20km of the proposed development, and five SSSIs within 10km of the proposed development. The sensitivities of each of the designated sites will be considered to inform survey work. A list of the designated sites identified and their qualifying features are provided in the table below. Figure 3 also illustrates the location of designations located within 10km of the site.

Table 5 SACs within 20km of the proposed development

Site No.	Site Name	Qualifying Features	Distance (km)	Direction
8638	Glen Shira	<ul style="list-style-type: none"> • Western acidic oak woodland 	9.76	N
8298	Loch Lomond Woods	<ul style="list-style-type: none"> • Otter <i>Lutra lutra</i> • Western acidic oak woodland 	14.27	E
8203	Ben Lui	<ul style="list-style-type: none"> • Acidic scree • Alpine and subalpine calcareous grasslands • Base-rich fens • High-altitude plant communities associated with areas of water seepage • Montane acid grasslands • Mountain willow scrub • Plants in crevices on acid rocks • Plants in crevices on base-rich rocks • Species-rich grassland with mat-grass in upland areas 	18.39	NNE

		<ul style="list-style-type: none"> • Tall herb communities • Wet heathland with cross-leaved heath 		
--	--	--	--	--

Table 6 SPAs within 20km of the proposed development

Site No.	Site Name	Qualifying Features	Distance (km)	Direction
10113	Glen Etive and Glen Fyne	<ul style="list-style-type: none"> • Golden eagle <i>Aquila chrysaetos</i>, breeding 	5.45	NE

Table 7 RAMSARs within 20km of the proposed development

Site No.	Site Name	Qualifying Features	Distance (km)	Direction
	Inversnaid	<ul style="list-style-type: none"> • Black grouse <i>Tetrao tetrix</i> • Pied flycatcher <i>Ficedula hypoleuca</i> • Redstart <i>Phoenicurus phoenicurus</i> • Twite <i>Carduelis flavirostris</i> • Wood warbler <i>Phylloscopus sibilatrix</i> 	17.91	NEE

Table 8 SSSIs within 10km of the Proposed Development

Site No.	Site Name	Qualifying Features	Distance (km)	Direction
163	Beinn an Lochain	<ul style="list-style-type: none"> • Siliceous scree (includes boulder fields) • Tall herb ledge • Upland assemblage 	2.39	NE
771	Hells Glen	<ul style="list-style-type: none"> • Bryophyte assemblage • Lichen assemblage • Upland oak woodland 	2.96	E
1500	Strone Point, North Loch Fyne	<ul style="list-style-type: none"> • Dalradian (Earth Sciences) 	4.51	NNW
980	Loch Eck	<ul style="list-style-type: none"> • Arctic charr <i>Salvelinus alpinus</i> • Bryophyte assemblage • Common whitefish <i>Coregonus lavaretus</i> • Fish assemblage 	5.89	S

		<ul style="list-style-type: none"> Flood-plain fen Oligotrophic loch 		
70	Ardchylne Wood	<ul style="list-style-type: none"> Upland oak woodland 	2.48	NW

4.5.4 Proposed Methodology

Potential ecological and ornithological constraints have been identified early within the process, and therefore it is proposed that the following surveys and assessments will be undertaken as a minimum:

- 24 months of vantage point (VP) ornithological surveys (3 VP locations: NN 13998 03997, NN 14400 05365 and NN 12300 04870);
- Diurnal raptor survey over 2 years;
- Breeding wader survey for 2 Years;
- Bat surveys (static and transect);
- Phase 1 habitat survey (to inform National Vegetation Classification Survey) and species scoping survey (to inform further protected/notable species survey).
- Ecological EIA Chapter;
- Ornithological EIA Chapter, including collision risk assessments).

Additional surveys/assessments may include:

- National vegetation classification (NVC) survey;
- Ground Water Dependant Terrestrial Ecosystem (GWDTE) assessment;
- Otter survey;
- Water vole survey;
- Pine marten survey;
- Wildcat survey;
- Freshwater fish assessment (salmon);
- Freshwater pearl mussel assessment.

All surveys and reporting shall follow current standard guidance, in particular the 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (Chartered Institute of Ecology and Environmental Management, 2016) and relevant SNH guidance. Surveys will be carried out at appropriate times of the year by appropriately qualified and experienced surveyors. Further consultation will be undertaken with the Argyll District Salmon Fisheries Board, SNH and SEPA to inform the methodology of aquatic surveys.

Information on nest locations of protected species will be treated as sensitive and will be incorporated into the EIA Report under the principles set out in the SNH guidance document (2009) 'Environmental Statements and Annexes of Environmentally Sensitive Bird Information'.

A survey of peat depths and peat characteristics will also be undertaken with the aid of a team of hydrologists and the results incorporated into the EIA Report.

Where required, suitable mitigation and/or restoration measures will be presented within a Habitat Management Plan. If necessary, a Deer Management Plan will also be produced.

4.5.5 Potential Mitigation Measures

Dependent on the results of the full ecological and ornithological surveys, any proposed mitigation measures are to be agreed with SNH and ABC before submission of the EIA Report.

4.6 Hydrology

4.6.1 Background

This assessment will consider the effects of the proposed wind farm on the hydrology of the existing site and surrounding area. In addition to assessing any potential hydrological effects to the site, areas outside the site boundary will be considered where necessary.

4.6.2 Guidance and legislation

The assessment will be undertaken in accordance with environmental legislation and statutory and general guidance relating to the water environment.

6.6.2.1 Legislation

Key legislative drivers relating to the water environment which will be considered within this assessment are listed below:

- Control of Pollution Act 1974;
- Environmental Protection Act 1990;
- Environment Act 1995;
- Groundwater Regulations 1998
- Water Framework Directive 2000/60/EC (WFD) 2000;
- Groundwater Directive 80/68/EEC;
- Groundwater Daughter Directive 2006/118/EC;
- Water Environment and Water Services (Scotland) Act (WEWS Act) 2003;
- Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended (CAR));
- The Environmental Liability (Scotland) Regulation 2009;
- The Private Water Supplies (Scotland) Regulations 2006;
- Flood Prevention and Land Drainage (Scotland) Act 1997;
- The Flood Risk Management (Scotland) Act 2009;
- Waste Management Licensing Regulations 1994; and
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011.

4.6.2.2 Statutory and general guidance

The Pollution Prevention Guidelines (PPGs), include the documents referred to below, which are the principal documents used for guidance on preventing contamination of surface water from construction activities. Those relevant to this wind farm development include:

- PPG1: General guide to the prevention of pollution (EA, SEPA & EHSNI);
- PPG2: Above ground oil storage tanks (EA, SEPA & EHSNI, 2004);
- PPG4: Treatment and disposal of sewage where no foul sewer is available (EA, SEPA & EHSNI, 2006);

- PPG5: Works and maintenance in or near water (EA, SEPA & EHSNI, 2007);
- PPG6: Working at construction and demolition sites (EA, SEPA & EHSNI);
- PPG8: Safe storage and disposal of used oils (EA, SEPA & EHSNI, 2004);
- PPG21: Pollution incidence response planning (EA, SEPA & EHSNI, 2004); and
- PPG26: Storage and handling of drums and intermediate bulk containers (EA, SEPA & EHSNI, 2006).

SEPA Guidelines

- Managing River Habitats for Fisheries, 2002.
- SEPA Indicative River & Coastal Flood Map (Scotland)
- Wastewater drainage position statement, 2008.
- Temporary Construction Methods, WAT-SG-29, 2009
- SEPA Flood Risk and Planning Briefing Note, 2009.
- Flood risk position statement, 2009.
- Technical flood risk guidance for stakeholders, SS-NFR-P-002, 2010.
- SEPA Regulatory Position Statement – Developments on peat, 2010
- Environmental Standards for River Morphology, WAT-SG-21, 2011.
- Land Use Planning System Guidance Note 4 (LUPS GU4), SEPA, May 2014.
- Land Use Planning System Guidance Note 147 (LUPS-GU14), SEPA 2014.
- Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, Land Use Planning System Guidance Note 31 (LUPS-GU31), SEPA 2014.
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011; A practical guide, 2011
- Managing River Habitats for Fisheries, SEPA, 2002.
- Methodology for the Water Framework Directive, Scotland and Northern Ireland Forum for Environmental Research, Project WFD 28 Final Report 2004.

Other Relevant Planning Policy and Guidance

- Control of water pollution from constructions sites. Guidance for consultants and contractors C532 (CIRIA, 2001);
- Environmental good practice on site C650 (CIRIA, 2005);
- Control of water pollution from linear construction projects: technical guidance C648 (CIRIA, 2006);
- SUDS Manual C697 (CIRIA, 697);
- Groundwater Control – design and practice C515 (CIRIA 2001);
- Good practice during windfarm construction (Scottish Renewables, SNH, SEPA & Forestry Commission Scotland, 2015);
- Planning Advice Note 61: Planning and SUDS, 2001;
- Planning Advice Note 79: Water and Drainage, 2006;
- Scottish Planning Policy ,2010;
- Draft Code of Practice for the sustainable use of soils on construction sites, DEFRA;
- Good practice guide for handling soil, DEFRA (MAFF 2000);

- UK (UKCP09) climate projections, DEFRA (2009);
- Guidance on Road Construction and Maintenance (Forests and Water Guidelines Fifth Edition 2011, Forestry Commission);
- A Handbook of Environmental Impact Assessment, SNH, 2005;
- Design Guidance on River Crossings and Migratory Fish, Scottish Executive, 2000;
- Argyll and Bute Local Development Plan, Policy LDP 3 – Supporting the Protection, Conservation and Enhancement of our Environment;
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments, 2006;
- Private Water Supplies: Technical Manual, Scottish Executive, 2006;
- Special Requirements for Civil Engineering Contracts for the Prevention of Pollution, Version 2, SEPA, 2006;
- UK Technical Advisory Group on the WFD, UK Environmental Standards and Conditions (Phase 2), Final, March 2008; and
- SNH Carbon and Peatland Map, 2016.

4.6.3 Proposed Methodology

The following tasks are proposed as part of the hydrology, hydrogeology and geological impact assessment:

- A desk based survey to assess the baseline site hydrological features and identify any Private Water Supplies. This will include consultation with SEPA, ABC, and Scottish Water;
- A site visit to examine the specific detail related to the design of the proposed development, to confirm the findings of the desk study, adding detail where appropriate, and to examine areas of uncertainty, such as the source of private water supplies and the proximity of water dependent habitats. Properties identified within the catchments of concern that may be reliant on private water supplies will be interviewed during the site visit, if this is not possible, a letter and questionnaire will be provided to these properties. Initial peat depth probing will be undertaken to confirm the presence of peat and provide an indication of depths across the site;
- It is anticipated that a detailed peat survey will be required and this will comprise of the following:
 - A desk study to determine if peat is likely to be present on a site using existing soil survey and/or geological survey maps at 1:50,000 scale where available, complemented by aerial imagery.
 - A low resolution 'first pass' to identify the broad extent and depth of peat across the site and identify areas which require more detailed survey prior to outline design and infrastructure location. This will include a depth measurement every 100m across the area likely to be suitable for development. Areas of the application site which are unlikely to be developed (due to other constraints) do not need to be surveyed at this intensity. Peat probing will not be undertaken during the breeding season within the neighbouring SPA.
 - A more detailed survey of peat depth and physical characteristics, focussing on likely infrastructure locations and sensitive areas (e.g. deep peat, steep slopes at risk of slide, peat drainage features) which need to be avoided and included in the outline design of the development. This will require a depth measurement and site description every 10 to 50m and cores at each turbine location.
 - If the wind farm infrastructure cannot be designed to avoid areas of deep peat on steep slopes at risk of sliding further detailed surveys and assessment may be required for assessing the peat

characteristics, micro-siting options or designing appropriate mitigation. However, in line with EIA principles, avoidance by design will be the preferred method.

- Assessment of hydrological, hydrogeology and geological sensitivities e.g. local surface water and groundwater bodies (and therefore potential water dependent species and habitats). Specifically, a detailed site specific qualitative and/or quantitative risk assessment will be undertaken for proposed infrastructure within 250 m of GWDTE where the infrastructure will require excavation deeper than 1m, and within 100m of GWDTE if excavations are shallower than 1m;
- Identification and mitigation of potential impacts. Where necessary recommendations will be made as to how the works should be undertaken to minimise the impact on surface water and groundwater to reduce the significance of effect where possible. If required reference will be made to pollution prevention guidelines published by SEPA. These mitigation measures and management strategies will then input to the design process to avoid/mitigate impacts.
- Evaluation of the significance of the potential residual impacts of the proposed design. The report will focus on addressing any potential concerns from the council's and SEPA's scoping comments which will generally focus on the identification of sensitive receptors and construction management procedures to minimise pollution risks.
- Depending on the findings of the hydrological and ecological assessments and the final design layout, further investigation such as a flood risk assessment, peat assessment, detailed hydrogeological assessment for impacts on water abstractions and potential groundwater dependent terrestrial ecosystems may be required and will therefore be carried out if necessary. Where possible these will be addressed as much as possible through design and within the standard hydrological assessment.

4.6.4 Preliminary Baseline

4.6.4.1 Geology

The BGS 'Geology of Britain' Viewer shows that the project lies in an area of varied bedrock geology type, although primarily 'Argyll Group – Pelite, Semipelite and Psammite' (formed approximately 542 to 1000 million years ago). Other bedrock geology types found across the site include: 'Argyll Group - Metavolcaniclastic-igneous-rock', 'Argyll Group - Metalimestone And Pelite', 'Dalradian Supergroup - Metagabbro And Metamicrogabbro', and 'Glen Sluan Schist Formation - Pelite And Semipelite'. Bedrock is generally overlain by 'Hummocky (moundy) Glacial Deposits - Diamicton, Sand and Gravel', which was formed up to 3 million years ago in the Quaternary Period.

Hydrogeology

SEPA indicate that the site is located within the 'Loch Fyne and Loch Long' groundwater body which has been classified as having an overall status of Good with High confidence in 2008.

4.6.4.2 Hydrology

The main watercourses within and surrounding the site at Creag Dhubh include the tributaries of the River Cur, which discharges into Loch Eck and subsequently the River Eachaig. The site is hydrologically connected to River Eachaig catchment a freshwater fish protected area for salmonids and Loch Eck a Site of Special Scientific Interest (SSSI).

4.6.4.3 Flood Risk

The figure overleaf shows the flood risk associated with the application site and surrounds.

An explanation of the terms displayed on the maps is provided below:

- High likelihood: A flood event is likely to occur in the defined area on average once in every ten years (1:10). Or a 10% chance of happening in any one year.

- Medium likelihood: A flood event is likely to occur in the defined area on average once in every two hundred years (1:200). Or a 0.5% chance of happening in any one year.
- Low likelihood: A flood event is likely to occur in the defined area on average once in every thousand years (1:1000). Or a 0.1% chance of happening in any one year.

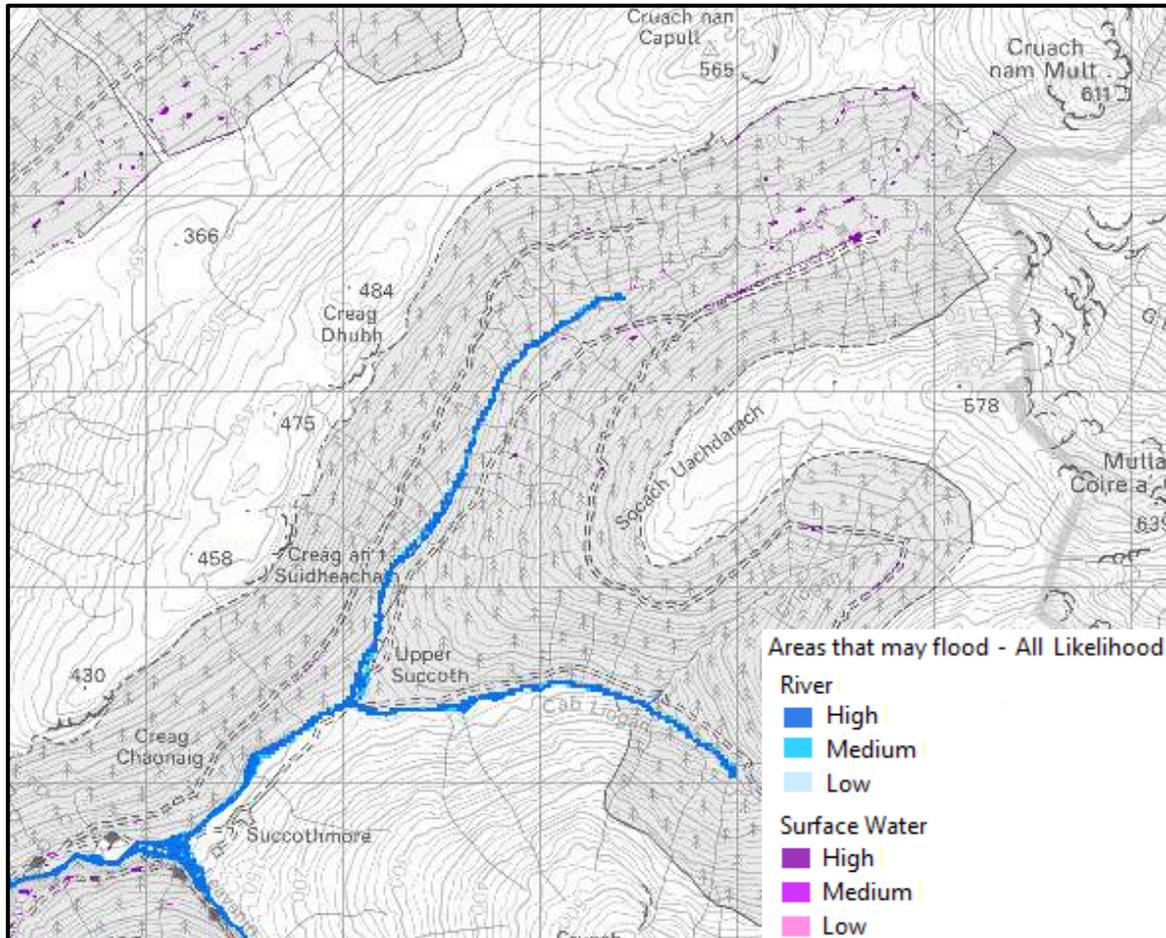


Figure 6 Scottish Environmental Protection Agency Indicative River and Coastal Flood Map. Accessed 2017.

4.6.4.4 Carbon-rich soil, deep peat and priority peatland habitat

The wind turbines would not be located in an area of Class 1 and 2 carbon-rich soil, deep peat and priority peatland habitat. However, it is proposed that where there is still potential for significant effects they will be reduced through siting, design and/or mitigation.

4.6.4.5 Private Water Supplies

It is requested that Argyll and Bute provide a list of private water supplies (PWS) located within 5km of the site. In accordance with SEPA guidelines if any PWS is located within 100m of a proposed access road, track or trench or 250m of a turbine, a full quantitative risk assessment will be carried out.

4.6.5 Potential Mitigation Measures

There is potential for a variety of impacts to hydrology because of the proposed wind farm at Creag Dhubh, which vary between stages of the project and can be categorised as construction, operational and decommissioning impacts.

4.6.5.1 Construction Phase

It is envisaged that mitigation measures will be required to control the potential for soil erosion and potential drainage issues. Consideration will be given to the potential effects on private water supplies during construction.

Consideration will be given to all hydrological features during the creation of access tracks, foundations, hard-standing, temporary site compound, control building and substation and during the laying of cables.

Specific mitigation measures will be proposed following full site investigations during the EIA process. Where or if required, mitigation measures may include the following:

- A Water Quality Monitoring Plan (WQMP) would address the requirement to monitor water quality and quantity at any PWS considered at risk. Visits would be made to undertake measurements and visual inspections. Additionally, required environmental actions would be recorded. The visits would be undertaken 6 months prior to construction, during construction and 6 months afterwards.
- An Accident Management Plan (AMP) that would detail contingency for any PWS at risk and spillage plans.
- A Contingency Plan (CP) to ensure that there would be no interruptions to water demand to the PWS.
- Methods to control groundwater, such as dewatering or physical cut-off will be avoided in areas adjacent to the PWS. Additionally, lengths and depths of drainage ditches will be minimised to reduce any potential lowering of the water table.
- All construction plant and equipment's location would be identified in relation to the PWS.
- A map would be created to show the potential locations of chemical contamination sources, such as fuel, oil and chemical storage areas, vehicle compound areas, refuelling sites and on-site sewage systems.
- Construction workers would be informed of the necessity to protect and prevent pollution from impacting upon the PWS.

4.6.5.2 Operational Phase

During the operational phase of the wind farm development, there are few additional mitigation measures to those identified during the construction phase.

Mitigation measures proposed during the operational phase would cover all aspects of operations aside from the use of vehicles to the site during maintenance trips during which could potentially result in accidental spillages of substances, such as oils and greases.

4.6.5.3 Decommissioning

The potential effects of decommissioning would be likely to be similar to the construction phase. It is appropriate that similar precautions and actions are taken to mitigate the effects.

Exact details of hydrological impacts would be defined in a decommissioning method statement presented to the Council before the process commences.

4.7 Cultural Heritage and Archaeology

4.7.1 Background

This section will consider the potential effects of the proposal on the cultural heritage and archaeological interests of the application site and surrounding area. Cultural heritage is represented by a wide range of features, both above and below ground, which results from past human use of the

landscape. These include standing buildings, many still in use, sub-surface archaeological remains and artefact scatters. Earthwork monuments as well as landscape features, such as field boundaries and industrial remains, will also be investigated to establish the scope of the full investigation.

4.7.2 Proposed Methodology

In order to examine the wide range of features included within the scope of cultural heritage the following sources will be consulted with supplementary sources utilised if necessary:

- The Royal Commission for Ancient and Historic Monuments of Scotland Pastmap Database;
- The Inventory of Gardens and Designed Landscapes in Scotland;
- Statutory List of Buildings of Special Architectural or Historic Interest; and
- Historic Scotland GIS data.

Distance from a development is a contributing factor when determining the magnitude of an effect to the built or cultural heritage. In order to place the site within its local context three distinct study areas have been identified:

- A- 500m from each turbine;
- B- 500m-5km from each turbine; and
- C- 5km-10km from each turbine.

If considered necessary, this search boundary may be expanded, in particular where features of national importance such as Category A listed buildings or historic gardens and designed landscapes are identified beyond 10km.

A qualified archaeologist will perform a desk based assessment and a walkover survey. The area within the site boundary will be surveyed and a detailed recording of all archaeological sites will be conducted using high-resolution digital photography, sketch survey drawings and a GPS capable of sub-metre accuracy.

Both direct and indirect effects will be assessed where appropriate, with a focus on the potential indirect effects upon the settings of assets of cultural heritage. Any potential effect will be assessed in accordance with pre-defined criteria to ascertain the overall magnitude of effect and sensitivity with any significant effects fully considered.

Finally, the cumulative effect of other proposed and consented wind farms will be assessed with the aid of cumulative visualisations.

4.7.3 Preliminary Baseline

The initial assessment shows any archaeological or cultural heritage assets within the site boundary (Table 9) and a summary of the nearest archaeological or cultural heritage assets of national importance outside of the site boundary up to a distance of 5km (Tables 10 and 11). In the EIA Report, this distance would be increased to 10km.

Table 9 All archaeology and cultural heritage assets within wind farm site boundary

Site Name	Site Type	Distance from Closest Turbine
Creag Dhubh River Cur	Historic Environment Record	0.5km

Table 10 Scheduled Ancient Monuments within 5km of wind farm site

Site Name	Distance from Closest Turbine
An Dun, fort 360m N of Strachur Church	2.9km
Gleann Beag or Hell's Glen, deserted settlement	3.0km
Ardno, cairn 820m ESE of	3.1km
Tom nan Clach, cup & ring marked rock 550m NE of Hazel Bank	3.1km

Table 11 Listed buildings within 5km of wind farm site

Site name	Category	Distance from closest turbine
STRACHURMORE	B	2.8km
ST CATHERINES, ST CATHERINE HOTEL	C	3.1km
STRACHUR, THE SMIDDY	B	3.2km
STRACHUR, KILMAGLASH PARISH CHURCH AND SCULPTURED STONES	B	3.2km
STRACHUR, THE OLD INN	B	3.2km
STRACHUR HOUSE POLICIES, BETTY JENKINS'S BRIDGE	B	3.3km
STRACHUR HOUSE, HOME FARM, STABLES, SOUTH RANGE	B	3.6km
STRACHUR HOUSE, HOME FARM, STABLES, WEST RANGE	B	3.6km
STRACHUR HOUSE, HOME FARM, FARMSTEADING, SOUTH RANGE	B	3.6km
STRACHUR HOUSE, HOME FARM, STABLES, EAST RANGE	B	3.6km
STRACHUR HOUSE, HOME FARM, STABLES, NORTH WEST RANGE	B	3.6km
STRACHUR HOUSE, HOME FARM, STABLES, NORTH EAST RANGE	B	3.6km
STRACHUR HOUSE, HOME FARM, FARMSTEADING, EAST RANGE	B	3.6km
STRACHUR HOUSE, ORNAMENTAL BRIDGE	B	3.6km
STRACHUR HOUSE, LODGE AND GATEWAY	B	3.8km
BALLIEMORE COTTAGE	C	4.3km
BALLIEMORE	C	4.3km
DRUMSYNIEBEG FARM	C	4.4km
DUNDERAVE CASTLE	A	4.5km
POLE FARMHOUSE	C	4.6km
STEADING	C	4.6km
BRIDGEND, BRIDGE	B	5.0km

Consultation with Historic Environment Scotland and ABC during the scoping stage will further inform the investigation.

4.7.4 Potential Mitigation Measures

Historic Environment Scotland states that 'for developments such as wind farms...the only potential mitigation is likely to be good design and responsive site layout which avoids or minimises effects to an acceptable degree.' Therefore, it is considered that the final site layout that will follow an iterative design process will minimise the need for mitigation.

Mitigation measures will primarily be required where direct effects may occur such as during ground-breaking construction works. Following the final study, mitigation measures will be agreed with a Council Archaeologist. Measures may include physical barriers between construction operations and sensitive assets in addition to a watching brief during ground-breaking works.

4.8 Shadow Flicker

4.8.1 Background

Shadow flicker is the effect caused by the rotating blades of a turbine periodically casting a shadow over neighbouring properties as they turn. The magnitude of shadow flicker varies both spatially and temporally depending on a number of coinciding environmental conditions. The factors determining the occurrence of shadow flicker nuisance include:

- Sun- position, intensity, height and path;

- Wind- speed and prevailing direction;
- Cloud cover;
- Position of the receptor- distance from turbine, orientation, location of windows;
- Height of turbine and rotor diameter;
- Position of the turbine- rotor orientation;
- Time- of day and year;
- Intervening topography, buildings or vegetation.

Distance of the turbine from the property is one of the most crucial factors in determining potential shadow flicker effects. Shadow flicker effect decreases with distance as there are fewer times when the sun is low enough to cast a long shadow and there is more possibility for screening from intervening topography, buildings or vegetation. In addition to this, the centre of the rotor's shadow passes more quickly over the land, reducing the duration of the effect.

4.8.2 Proposed Methodology

The objectives of the assessment will be to identify whether any shadow flicker effects would occur at any sensitive receptors and to calculate the approximate times of day and year that these effects would occur.

In accordance with the Scottish Government's Renewables Advice – Onshore Wind Turbines (2011) all properties within 820m (10 rotor diameters) of the turbine locations will be taken into consideration in the assessment.

It is considered that throughout the UK due to the path of the sun across the sky that only properties within 130° either side of north, relative to the turbines can be affected.

4.8.3 Preliminary Baseline

All properties are located at a distance greater than 10 x rotor diameters (820m) from any proposed turbine.

4.8.4 Potential Mitigation Measures

It is expected that no mitigation measures will be required at any properties surrounding Creag Dhubh.

4.9 Cumulative Effect

4.9.1 Background

Cumulative effects of neighbouring wind farm developments will be considered within a variety of environmental aspects of the EIA Report, including the landscape and visual, noise and cultural heritage assessments.

4.9.2 Proposed Methodology

Cumulative studies are a component in many sections within the EIA Report and their methodology and results will be detailed in the relevant chapters. Consideration will be paid to commercial wind turbines and wind farms over 50m to blade tip that are operational, consented, or currently in the planning process. A 'wind farm' has been assumed to consist of a cluster of three or more turbines of commercial scale. At this stage, scoping projects have not been considered however, they will be included within the EIA Report, where appropriate. A baseline map of all relevant projects within 60km

will be produced to inform the studies. Data is to be collected from a variety of sources including ABC's planning records and other wind energy developers.

4.9.3 Preliminary Baseline

A list of operational, consented and proposed commercial wind turbine projects within 60km of Creag Dhubh is shown in Table 12.

Table 12 Operational, approved and proposed wind farms within 60km of Creag Dhubh

Wind Turbine Development	Distance to Creag Dhubh
OPERATIONAL PROJECTS	(km)
Clachan Flats	9
An Suidhe	12
Cruach Mhor	16
A Chruach	20
Carraig Gheal	23
Beinn Ghlas	26
Srondoire	40
Allt Dearg	41
CONSENTED PROJECTS	
A'Chruach 2	19
CURRENT APPLICATIONS	
Upper Sonachan	17

4.9.4 Potential Mitigation Measures

The cumulative assessment will inform the iterative design process with care taken to minimise any cumulative visual or landscape effects. Therefore, it is expected that mitigation measures will not be required.

4.10 Existing Infrastructure, Telecommunication Television, Aviation and Electromagnetic Safety

4.10.1 Background

This chapter will assess the possible effects of the proposed turbines at Creag Dhubh on existing communications infrastructure and aviation safeguarding facilities. Wind turbines have the potential to be a physical obstruction that could affect communication networks and aviation activities. Therefore, these issues need to be addressed and any effects that require mitigation will be detailed in this section.

4.10.2 Proposed Methodology

Guidance outlined by the BWEA has been followed and a wind turbine pro-forma has been issued to the MOD, CAA and BAA.

Consultation requests were also submitted to the main communication and utilities providers identified as potentially affected by the proposed wind farm development. A table with the consultees responses will be included in the EIA Report.

4.10.3 Preliminary Baseline

Results from the scoping exercise will inform the baseline of the assessment.

4.10.4 Potential Mitigation Measures

Mitigation measures will not be considered necessary in the EIA Report. All concerns that may arise from consultees will be dealt with appropriately through the iterative design process.

4.11 Other Issues

4.11.1 Socio-economic Effects

The proposed wind farm would result in the creation of jobs during the construction period in addition to permanent jobs in maintenance of the turbines. Where possible, all materials and labour would be sourced locally.

A socio-economic assessment will provide discussion and predictions on the effects to the area through various measures by:

- Providing a baseline socio-economic context to which the project is situated;
- Identifying socio-economic issues that may be relevant specifically to the local communities;
- Identifying the potential positive and negative effects of the wind farm;
- Provide detail on how any effects can be addressed.

4.11.2 Traffic, Transport and Access

Wynns Ltd will undertake a transport and access assessment to show the feasibility of the chosen access route to the wind farm.

The assessment will:

- Describe baseline road and traffic conditions;
- Provide an estimate of trips generated by the construction, operation and decommissioning of the wind farm;
- Assess the effects of the wind farm to the baseline conditions;
- Identify any appropriate mitigation measures.

5 How to respond to the Scoping Report

Responses to the Scoping Report should be sent to the following address:

Planning and Regulatory Services
1A Manse Brae
Lochgilphead
Argyll
PA31 8RD

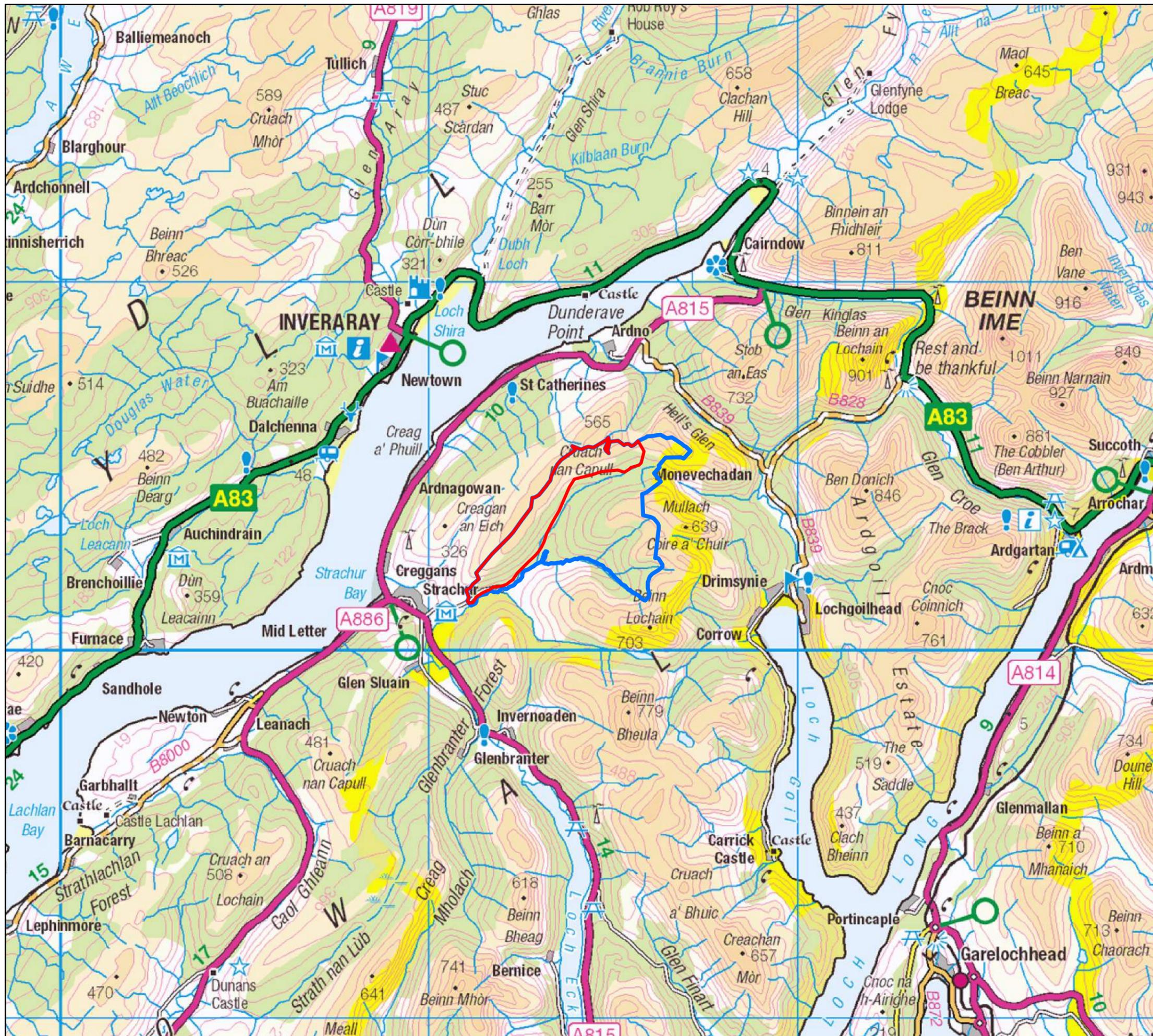
E-mail: centralvalidationteam@argyll-bute.gov.uk

Creag Dhubh Renewables LLP would also be grateful if a copy of the scoping response could be forwarded to the following address:

FAO Angus Elder
Creag Dhubh Renewables LLP
Muirden
Turriff
Aberdeenshire
AB53 4NH

E-mail: angus.elder@duncanfarms.co.uk

Copies of the Scoping Report are also available from the above address.



PROJECT: CREAG DHUBH

CLIENT: CREAG DHUBH RENEWABLES

FIGURE 1

Site location

Scale: 1:100,000

Checked by: AF

Drawn by: AE

Date: 28/08/2017

Key:



Site boundary



Land ownership boundary

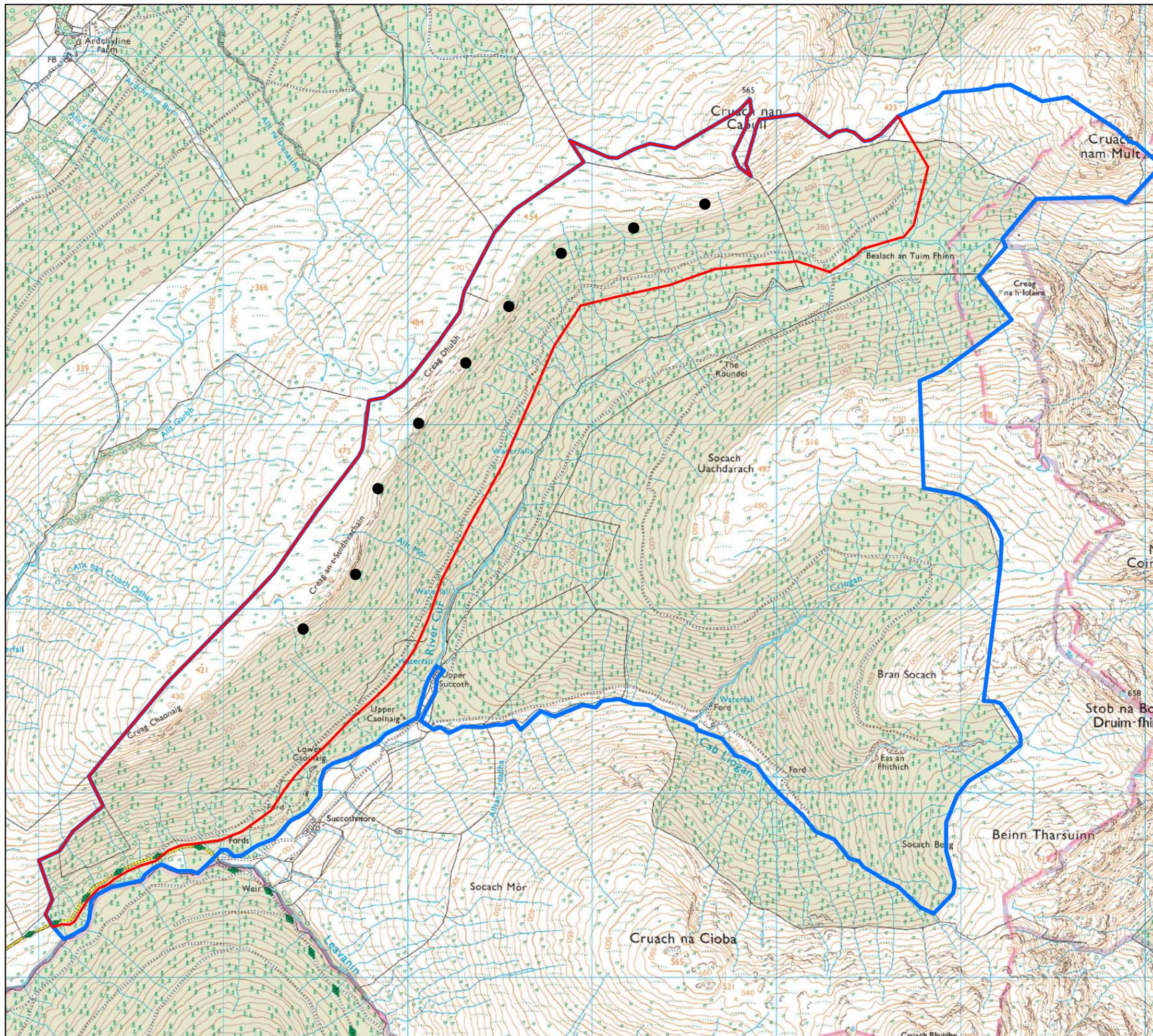


Crown copyright 2017. All rights reserved. Ordnance Survey licence number 100050155.



MURDEN ENERGY LLP
 Muirden
 Turriff
 Aberdeenshire
 AB53 4NH



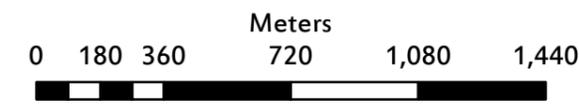


PROJECT: CREAG DHUBH
 CLIENT: CREAG DHUBH RENEWABLES

FIGURE 2
 Site Layout

Scale: 1:20,000
 Drawn by: AE
 Checked by: AF
 Date: 28/08/2017

- Key:**
- Wind turbine
 - ▭ Site boundary
 - ▭ Land ownership boundary

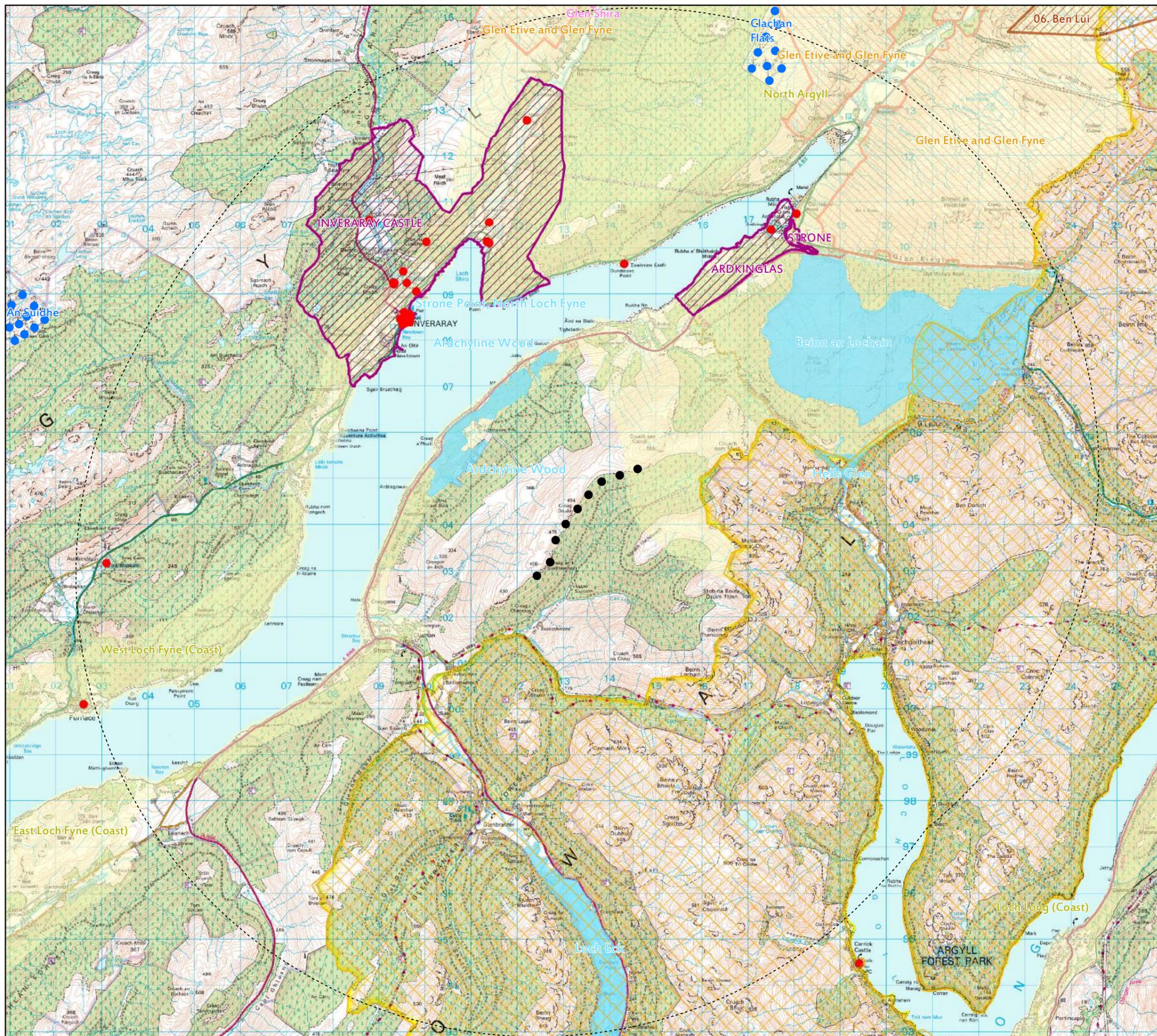


Crown copyright 2017. All rights reserved. Ordnance Survey licence number 100050155.



MUIRDEN ENERGY LLP
 Muirden
 Turriff
 Aberdeenshire
 AB53 4NH



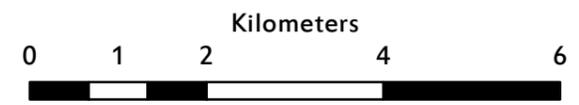


PROJECT: CREAG DHUBH
 CLIENT: CREAG DHUBH RENEWABLES

FIGURE 3
 Environmental designations with operational and consented wind farms

Scale: 1:80,000 Checked by: AF
 Drawn by: AE Date: 28/08/2017

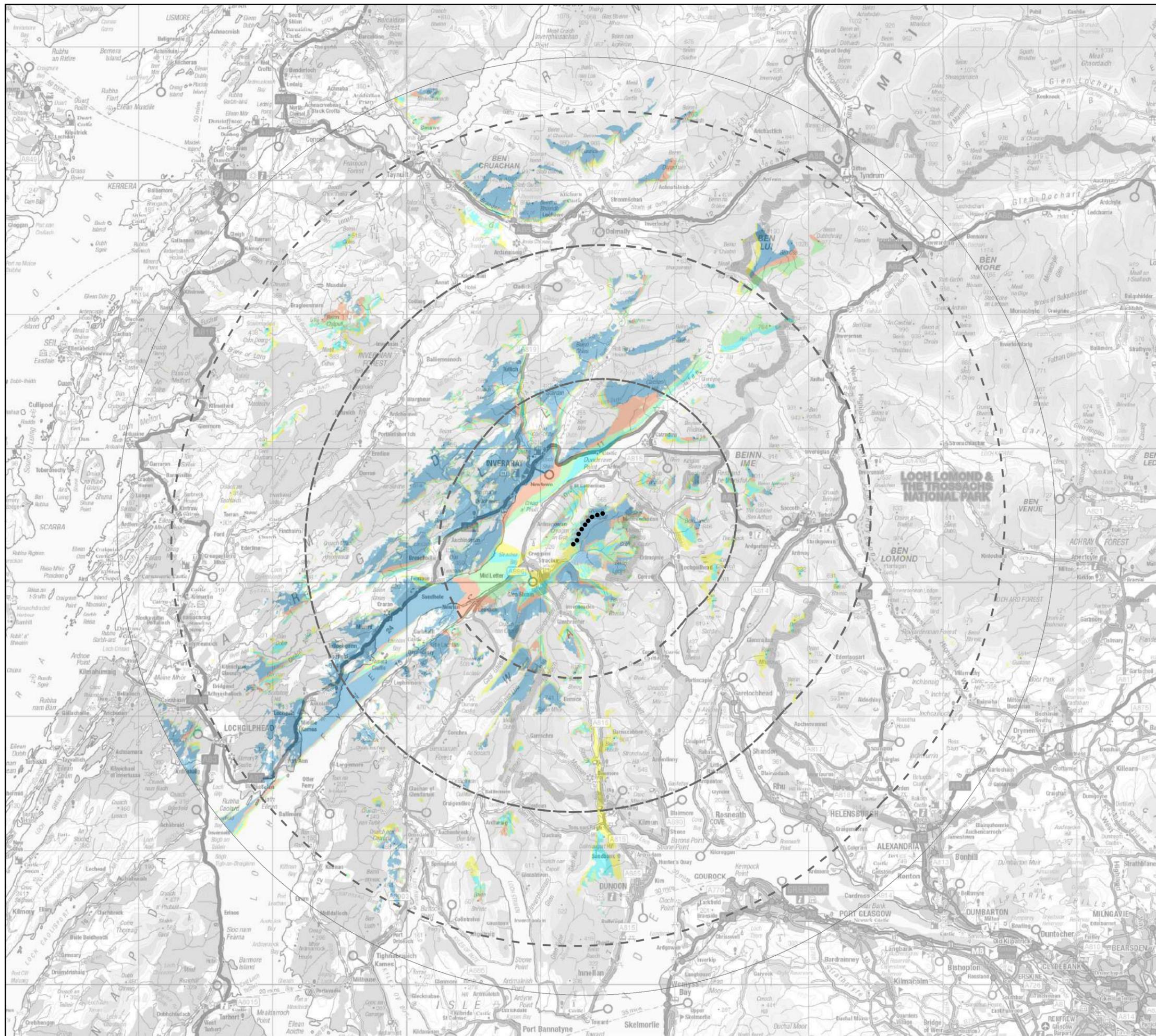
- Key:**
- Craig Dhubb wind turbine
 - ⊠ 10km buffer ring
 - ▨ LLaTT National Park
 - National Scenic Area
 - ▨ Wild Land Area
 - Category A listed buildings
 - National Nature Reserve
 - ▨ RAMSAR
 - Special Area of Conservation
 - ▨ Special Protection Area
 - Site of Special Scientific Interest
 - ▨ Gardens and Designed Landscapes
 - ABC Area of Panoramic Quality
 - Operational wind turbine
 - In planning wind turbine



Crown copyright 2017. All rights reserved. Ordnance Survey licence number 100050155.



MUIRDEN ENERGY LLP
 Muirden
 Turriff
 Aberdeenshire
 AB53 4NH

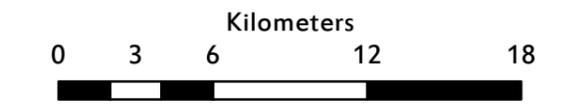


PROJECT: CREAG DHUBH
 CLIENT: CREAG DHUBH RENEWABLES

FIGURE 4
 Zone of theoretical visibility to blade tip height

Scale: 1:270,000 Checked by: AF
 Drawn by: AE Date: 28/08/2017

- Key:**
- Wind turbine
 - 35km study area
 - 10km buffer rings
 - 1 - 2 turbines visible
 - 3 - 4 turbines visible
 - 5 - 6 turbines visible
 - 7 - 8 turbines visible
 - 9 turbines visible

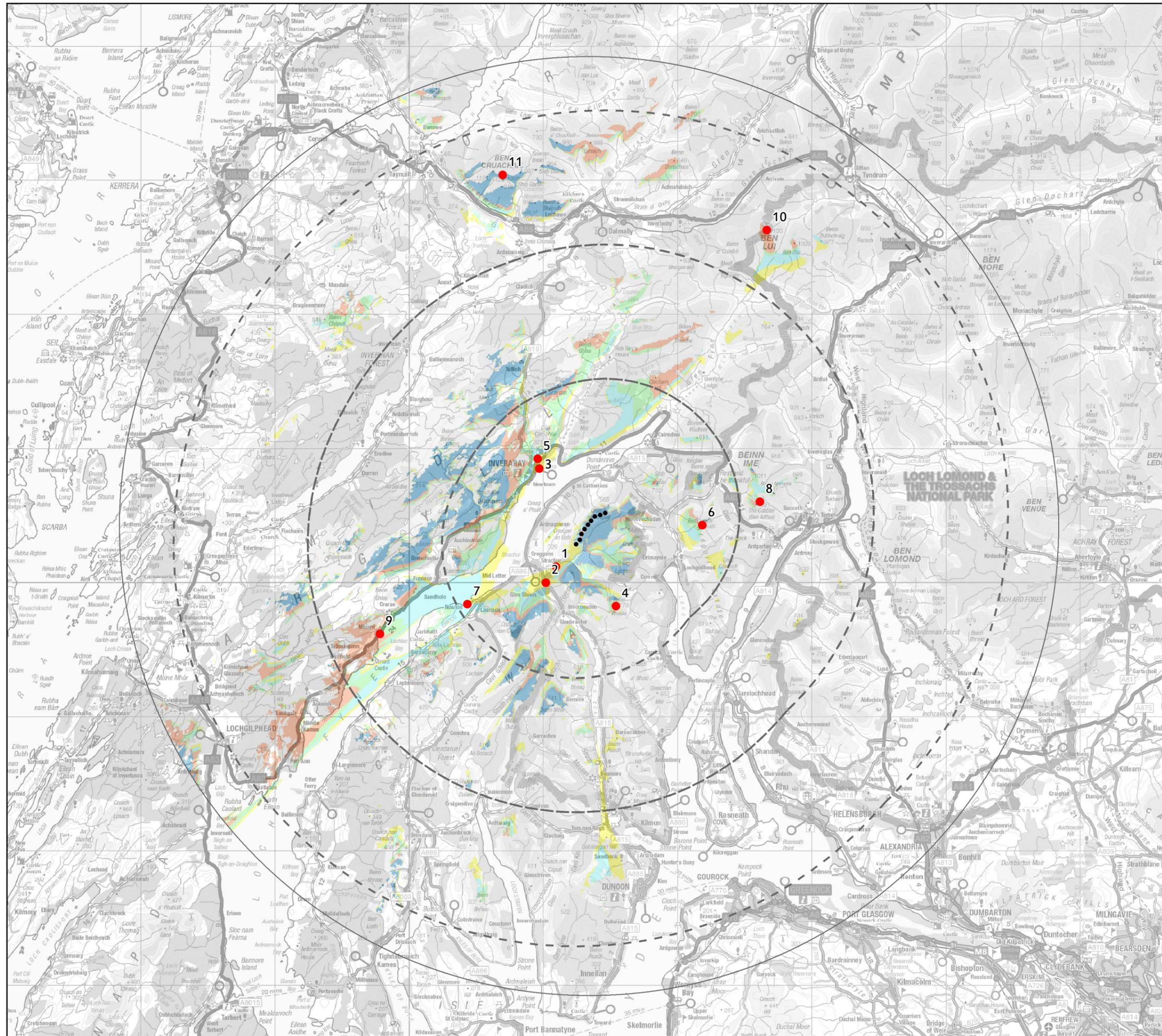


Crown copyright 2017. All rights reserved. Ordnance Survey licence number 100050155.



MURDEN ENERGY LLP
 Muirden
 Turriff
 Aberdeenshire
 AB53 4NH





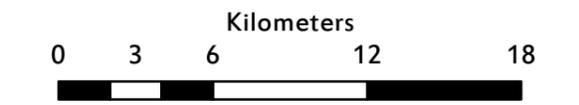
PROJECT: CREAG DHUBH
 CLIENT: CREAG DHUBH RENEWABLES

FIGURE 5
 Zone of theoretical visibility to hub height with proposed viewpoint locations

Scale: 1:270,000 Checked by: AF
 Drawn by: AE Date: 14/09/2017

- Key:**
- Proposed viewpoints
 - Wind turbine
 - 35km wind farm buffer
 - 10km buffer rings
 - 1 - 2 turbine hubs visible
 - 3 - 4 turbine hubs visible
 - 5 - 6 turbine hubs visible
 - 7 - 8 turbine hubs visible
 - 9 turbine hubs visible

- Viewpoint locations:**
- 1 - Cowal Way
 - 2 - A815
 - 3 - Inverary (Front Street East)
 - 4 - Beinn Bheula
 - 5 - Inverary Castle
 - 6 - Ben Donich
 - 7 - Newton
 - 8 - Ben Arthur
 - 9 - A83 (Minard)
 - 10 - Ben Lui
 - 11 - Ben Cruachan



Crown copyright 2017. All rights reserved. Ordnance Survey licence number 100050155.



MURDEN ENERGY LLP
 Muirden
 Turriff
 Aberdeenshire
 AB53 4NH

