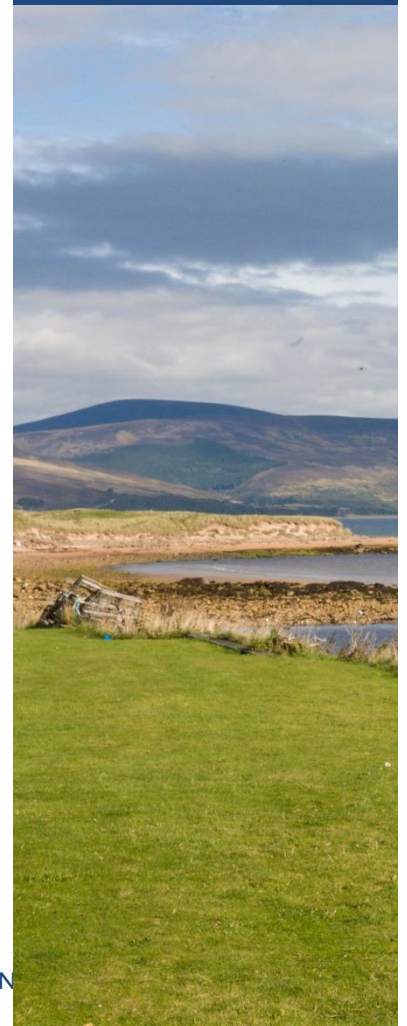


COGLE MOSS WIND FARM REPOWERING AND EXTENSION

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Preface

This Scoping Report for a proposed wind farm at Cogle Moss, near Watten in Highland, 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 The Highland Council adopt a Scoping Opinion in relation to the proposal at Cogle Moss.

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.

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1 Introduction

1.1 Background

Cogle Moss Renewables LLP (hereinafter referred to as 'the Applicant') are looking at the opportunity to develop a wind farm at Cogle Moss, near Watten in Highland. It is considered that the wind farm will have a generating capacity of greater than 20MW. The wind farm will comprise wind turbines, crane hardstandings, access tracks, a substation, and a temporary construction compound.

Previously Cogle Moss Wind Farm (15/02769/FUL) was granted permission by the Scottish Government in July 2017 ('the permitted scheme'). The Applicant is now investigating the opportunity to extend and repower the permitted scheme with a development comprising 14 larger wind turbines and associated infrastructure, including a revised access track ('the proposed development'). The larger wind turbines would take advantage of the improvements to wind turbine technology since the projects inception and consequently they will maximise the potential of the site.

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 The Highland Council (THC). This Scoping Report therefore forms part of a request from the Applicant to THC 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 proposed development. 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 proposed development. 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 THC 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:

- **Caithness Local Development Plan (As continued in force, 2012)**

The Caithness Local Development Plan should be read in conjunction with the Highland-wide Local Development Plan; however, the majority of the Caithness Local Plan has been replaced by the Highland Wide Local Development Plan.

- **Highland wide Local Development Plan (2012)**

The Highland wide Local Development Plan (HwLDP) which was adopted on 5 April 2012 includes the following notable policies that are relevant to the proposal:

- Policy 28: Sustainable Design;
 - Policy 29: Design, Quality and Place Making;
 - Policy 30: Physical Constraints;
 - Policy 51: Trees and Development;
 - Policy 52: Principle of Development in Woodland;
 - Policy 55: Peat and Soils;
 - Policy 56: Travel;
 - Policy 57: Natural, Built and Cultural Heritage;
 - Policy 58: Protected Species;
 - Policy 59: Other Important Species;
 - Policy 60: Other Important Habitats;
 - Policy 61: Landscape;
 - Policy 63: Water Environment;
 - Policy 64: Flood Risk;
 - Policy 66: Surface Water Drainage;
 - Policy 67: Renewable Energy Developments;
 - Policy 72: Pollution;
 - Policy 77: Public Access.
- **The Caithness and Sutherland Local Development Plan (CaSPlan) – Modified Proposed Plan (September, 2016)**

The Caithness and Sutherland Local Development Plan (CaSPlan) will set out The Highland Council’s vision and development strategy for the area over the next 20 years. Once formally adopted it will replace the Caithness Local Plan and Sutherland Local Plan and will be used as a material consideration to guide decisions on planning applications.

The plan refers to the vision of the region to be an internationally renowned centre for renewable energy in 2035, as well as a place where high quality environment and heritage are celebrated and valued assets are safeguarded.

THC has issued the following supplementary planning guidance and policy interpretation documents:

3. Supplementary planning guidance

- **Supplementary Guidance: Onshore Wind Energy (2016) (including Addendum (2017));**

The Highland Council ‘Onshore Wind Energy Supplementary Guidance’ (SG) was adopted by the Council in November 2016 and now forms part of the Development Plan. The Guidance makes it clear at the outset that the aspects of it related to various land use planning topics are informative and not exhaustive, and proposals will continue to be assessed by all relevant policies in the HwLDP.

The SG groups areas into three categories based on desktop constraints:

- Group 1: Areas where windfarms will not be acceptable
- Group 2: Areas of significant protection
- Group 3: Areas with potential for wind farm development

The site is a Group 2 area due to it being located within the Wick Airport safeguarding surfaces. A detailed aviation assessment will therefore be produced to illustrate that there would be no unacceptable effects to Wick Airport.

3 Project Description

3.1 Site Description

3.1.1 Location

The proposed development would be located on Cogle Moss – farmland situated approximately 3km north east of Watten and 9km west of Wick. The site boundary borders the B874 road to the south, the Moss of Killimster to the east, and farmland to the west. The location of the site is shown in Figure 1 of the appended maps.

The character of the majority of the site is typical of the Sweeping Moorland landscape character type that is generally free from dominant visual foci and instead mostly comprises a horizontal or gentle sloping uninterrupted skyline. In addition to the site of the permitted scheme, the site has been extended to include Kirk Wood to the east of Cogle Moss. The proposed development would therefore be set within a low-lying area of moorland that has historically been used for peat extraction in the southern section of the site, and a small area of forestry in the north east.

The site is bounded to the south by the B874 and by a commercial coniferous forestry plantation to the south-east. The moorland area extends beyond the site boundary to the north east and to the west of the proposed development site the land use is predominantly agricultural fields used for both crop and livestock grazing.

The site is located approximately 4km north of the cluster of operational wind farms comprising Bilbster, Achairn and Wathegar.

3.2 The Proposed Development

3.2.1 Overview of the development

The main components of the proposed development comprise:

- 14 turbines up to 115m to blade tip and each with a rated output of up to 3MW, giving a total generating capacity of up to 42MW;
- 14 crane hardstandings;
- Permanent access tracks;
- Electrical and communication underground cables running along most of the access track;
- A substation and control building.

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 plan for the proposed development consists of 14 wind turbines. Eleven of the fourteen turbines are located within the permitted micro-siting allowance (50m) for the turbines included in the permitted scheme, whilst T5 from the permitted scheme has been removed. The remaining three turbines (the extension) are located within the additional area of Kirk Wood. The site layout is shown in Figure 2 of the appended maps.

Preliminary turbine coordinates are tabulated overleaf.

Table 1 Wind turbine co-ordinates

Turbine Number	Easting	Northing
T1	327687	957000
T2	327511	956657
T3	327124	956433
T4	327820	956380
T5	328347	956157
T6	327905	956710
T7	328149	956432
T8	327699	956019
T9	327423	956321
T10	327826	955671
T11	327471	955647
T12	327291	955946
T13	328294	955822
T14	328593	955761

3.2.3 Turbine Specification

The turbine model will be subject to a tendering process; however, at this stage the candidate turbine is the Enercon E92 model. This turbine model will be used as a basis for the EIA.

3.2.3.1 Turbine geometry

The proposed turbine specifications are provided below:

Blade Number:	3
Rotor Diameter:	92m
Tower Height:	68m
Blade Tip Height:	Circa. 115m
Rated Power:	2.3-3MW

3.2.3.2 Turbine colour

Where parts or entire wind turbines are likely to be viewed from sensitive viewpoints against a landform or forestry 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).

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

A different access to the site is proposed in comparison to the permitted scheme. The access to the site will be from the B874 using the existing access to Bilbster Forest to the southeast of the site. The existing tracks would require to be improved so that they comply with the specifications detailed in the EIA Report. The principles to 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 be 4m wide and 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 12 abnormal loads.

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 selected turbine model. However, it is currently envisaged that the access route to the site will use the public road network from Wick harbour. 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 from conventional building materials with a finish colour to be agreed with THC. 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 selected 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 14 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 development 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 THC prior to consent being granted.

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 development 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 proposed development on existing areas of landscape character, patterns and elements within or close to the site. The visual assessment will consider the effects of the proposed development 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.

The LVIA for the permitted scheme will form part of the baseline assessment of the proposed development.

4.3.2 Guidance

- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Landscape Institute and Institute of Environmental Management and Assessment, 2013;
- 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, 2015;
- Good practice during windfarm construction. Scottish Renewables, Scottish Natural Heritage, Scottish Environmental Protection Agency and Forestry Commission Scotland, 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;
- Caithness and Sutherland landscape character assessment, Scottish Natural Heritage, 1998;
- Assessment of Highland Special Landscape Areas, The Highland Council and Scottish Natural Heritage, 2010;
- Landscape Sensitivity Appraisal: Black Isle, Surrounding Hills and Moray Firth Coast, and Caithness, 2017;
- Cumulative Landscape and Visual Assessment of Wind Energy in Caithness, Land Use Consultants, 2014;

4.3.3 Study Area

An initial 35km radius study area has been identified 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 study area, including designated landscapes, 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 the cumulative study area, 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 the agreed viewpoints (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 receptors, in particular any change in effect as a result of increased size and number of the turbines for this second proposal at Cogle Moss;
- Assess the visual and cumulative effects on local settlements;
- Assess within the LVIA the visual effects to users of key transport and recreational routes;
- 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.

4.3.5 Preliminary Baseline

4.3.5.1 Landscape Character

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

'A wide open landscape of gently rolling pastures with flagstone field boundaries and occasional pockets of bog and wood. There are extensive views inland to distant hills, in which the sky is often dominant. The coastal towns of Wick and Thurso encircle sheltered bays, while scattered farms and small villages are linked by a network of small roads. Chambered cairns and Iron Age brochs bear witness to the attraction of this area to prehistoric people. The more recent remains on the coast of large scale farms and mills indicate the progressive approach to agricultural improvement here in the 19th century, linked to overseas trade. Dounreay nuclear power station forms a prominent landmark. The rocky coast includes impressive cliffs that mark the most northern tip of mainland Scotland.'

The proposed development is primarily situated in an area of 'Sweeping Moorland', according to Scottish Natural Heritage's Landscape Character Assessment dataset, as well as a small area of 'Coniferous Woodland Plantation'. The *Sweeping Moorland* landscape character type (LCT) is a gently sloping, simple landscape that is common throughout Sutherland and Caithness. The landscape is generally free from dominant visual foci and instead mostly comprises a horizontal or gentle sloping uninterrupted skyline. Occasional foci comprise lochs and rivers that sit with shallow straths. The LCT is generally uninhabited and combined with its simplicity consequently draws the attention of an individual to more localised and experiential characteristics of the landscape.

THC's landscape sensitivity appraisal for the area surrounding Cogle Moss (CT6 Black Hill Mosses) indicates that there is no capacity for commercial wind farm development at this site. However, in the decision for the permitted scheme, the Scottish Government disagreed with this conclusion; considering that the sensitivity of the surrounding landscape was lower than indicated in the Council's appraisal. The Applicant agrees with this conclusion and considers that the site's location provides an opportunity to develop a wind farm.

4.3.5.2 Landscape Designations

Special Landscape Areas

THC has designated areas of regional importance in terms of their landscape quality, which are referred to in the local development plan as Special Landscape Areas (SLA). The study area includes three regionally important Special Landscape Areas (SLA): *Dunnet Head* SLA (12.5km northwest), *The Flow Country and Berriedale Coast* SLA (15km southwest), and *Duncansby Head* SLA (17km northeast).

4.3.5.3 Wind turbine developments

A list of operational, consented and proposed commercial wind turbine projects within 60km of the proposed development are listed in Table 3.

Table 3 A list of operational, consented and wind turbine projects within 60km of the proposal

Wind Turbine Development	Size of Project	Distance to Wind Turbine Development
OPERATIONAL PROJECTS		(km)
Bilbster	3 turbines	4
Achairn	3 turbines	4
Wathegar	14 turbines	5
Camster	25 turbines	7
Stroupster	13 turbines	10

Lochend	4 turbines	12
Burn of Whilk	9 turbines	13
Causeymire	21 turbines	15
Boulfrouich	15 turbines	23
Baillie	20 turbines	25
Hill of Lybster	1 turbine	28
Forss 1&2	6 turbines	28
Gordonbush	35 turbines	56
CONSENTED PROJECTS		
Halsary	15 turbines	10
Bad a' Cheo	13 turbines	12
Achlachan	5 turbines	13
Achalachan 2	3 turbines	13
Rumster Forest	3 turbines	16
Tigh Na Muir	1 turbine	16
Lychrobbie	3 turbines	25
Strathy South	46 turbines	46
Gordonbush Extension	16 turbines	58
PROPOSED PROJECTS		
Golticlay	19 turbines	16
Limekiln	24 turbines	28
Drum Hollistan	17 turbines	32
Strathy Wood	26 turbines	44
Navidale	5 turbines	44
West Garty	17 turbines	50

4.3.5.4 Visual Receptors

A blade tip Zone of Theoretical Visibility (ZTV) (see Figure 4) shows the predicted visibility of the proposed wind turbines 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 THC and SNH.

Settlements

Table 4 shows a number of settlements and their predicted visibility of the proposed turbines tips as informed by the ZTV.

Table 4 Closest settlements and the predicted theoretical visibility of the proposal

Settlement	Distance from Site	Predicted Theoretical Visibility
Watten	3.3	Full
Keiss	8	Full
Wick	10.2	Partial

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.

Viewpoints

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 THC and SNH. The following viewpoints in Table 5 were used to assess the permitted scheme, and an appraisal of which of these viewpoints should be included for the proposed application is provided below. In some instances, where a preliminary appraisal has identified that the level of effect will not increase significantly in comparison to the permitted scheme, a viewpoint has been scoped out of the LVIA. However, a range of viewpoints have been maintained that will illustrate the key changes to the proposed development.

Table 5 Proposed viewpoints

Viewpoint	Receptor	Appraisal	
VP1	Watten Caravan Park	Recreational users and tourists	The proposed extension would not increase the horizontal extent of the wind farm when seen from this viewpoint. Potential very slight increase to magnitude of effect of permitted scheme, which could result in a significant visual effect. <i>To be included in LVIA.</i>
VP2	B876, Black Hill	Road users	Illustrates potential effect of increased turbine size and number from the north east. To be included in LVIA.
VP3	B870, Livestock Market	Local residents, road users and workers	Illustrates potential effect of increased turbine size and number from the north west. <i>To be included in LVIA.</i>
VP4	B876, Reiss	Road users	Illustrates potential effect of increased turbine size and number from the north east. To be included in LVIA.
VP5	A882, Bylibster	Local residents and workers	Illustrates potential effect of increased turbine size and number from the south west. <i>To be included in LVIA.</i>
VP6	Wick	Local residents, road users and workers	The proposed extension would not increase the horizontal extent of the wind farm when seen from this viewpoint. At a distance of ~10km, it is not considered that the increase in turbine size or number will result in a significant increase to the level of effect assessed for the permitted scheme. <i>Scoped out of LVIA.</i>
VP7	Stemster Hill	Recreational users	No predicted increase to magnitude of effect of previous application primarily due to distance from viewpoint (~15km). <i>Scoped out of LVIA.</i>
VP8	Spittal Hill	Recreational users	The proposed extension would not increase the horizontal extent of the wind farm when seen from this viewpoint. At a distance of ~10km, it is not considered that the increase in turbine size or number will result in a significant increase to the level of effect assessed for the permitted scheme. <i>Scoped out of LVIA.</i>
VP9	Castle Sinclair Girnigoe	Recreational users and tourists	The proposed extension would not increase the horizontal extent of the wind farm when seen from this viewpoint. At a distance of ~10km, it is not considered that the increase in turbine size or number will result in a significant increase to the level of effect assessed for the permitted scheme. <i>Scoped out of LVIA.</i>
VP10	Alterwall	Local residents	The proposed extension would increase the horizontal extent of the wind farm when seen from this viewpoint. Potential slight increase in effect to permitted scheme to moderate, but it is not considered that would result in a significant effect. <i>Scoped out of LVIA.</i>
VP11	Dunnet Head	Recreational users and tourists	No predicted increase to magnitude of effect of permitted scheme primarily due to distance from viewpoint (~20km). <i>Scoped out of LVIA.</i>
VP12	A882, West Watten	Local residents and road users	Potential very slight increase to magnitude of effect of permitted scheme, which has potential to be significant. <i>To be included in LVIA.</i>
VP13	Keiss, A99	Local residents and road users	Potential very slight increase to magnitude of effect of permitted scheme, which has potential to be significant. <i>To be included in LVIA.</i>
VP14	A99, Loch Hempriggs	Road users	No predicted increase to magnitude of effect of permitted scheme primarily due to distance from viewpoint. <i>Scoped out of LVIA.</i>
VP15	Badlipster	Local residents and road users	No predicted increase to magnitude of effect of permitted scheme primarily due to distance from viewpoint. <i>Scoped out of LVIA.</i>

VP16	Warth Hill	Recreational users and tourists	No predicted increase to magnitude of effect of permitted scheme primarily due to distance from viewpoint. <i>Scoped out of LVIA.</i>
VP17	A99, Wick (Tesco)	Road users and local residents	Very limited theoretical visibility of blade tips. <i>Scoped out of LVIA.</i>
VP18	A882, Stirroke House	Road users	Potential very slight increase to magnitude of effect of permitted scheme, which has potential to result in a significant effect. <i>To be included in LVIA.</i>
VP19	A882, Milton	Local residents and road users	Potential very slight increase to magnitude of effect of permitted scheme, which does not have potential to result in a significant effect. <i>To be included in LVIA.</i>

4.3.6 Potential Mitigation Measures

The iterative design process, including the design of the permitted scheme, will help to produce a sensitively designed wind farm.

Several measures will be undertaken to reduce the landscape and visual impact during construction of the proposed development. 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 proposed development. 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

Fourteen Enercon E92 wind turbines are proposed, which are able to operate in a range of operating modes, if required.

Assessment Methodology

Consultation

Consultation will be carried out with THC to establish the requirements of the assessment in relation to operational 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 is 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 $G=1$. 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 $G=0.5$.

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 were conducted in accordance with ETSU-R-97 and the more recent IOA (2013) good practice guide for the permitted scheme. The surveys incorporated long-term measurements of over two weeks at noise sensitive receptors. The number and the locations of the noise meters was agreed with THC prior to carrying out the surveys. The results comprised 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 were standardised to a height of 10m above ground level using the data recorded on an onsite meteorological mast.

An assessment of independent and cumulative (if required) wind turbine noise levels against the measured background noise levels will be carried out to identify the level of effects to noise sensitive receptors. Currently there are no cumulative noise considerations.

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;
- 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 THC 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 development 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 SAC Consulting have been commissioned by the Applicant to undertake the required surveys and assessment.

Ecological and ornithological surveys were undertaken for the permitted scheme, which will help to inform the assessment for the proposed development. The survey effort to date for the original application site has included:

- Breeding bird surveys in 2013 and 2016 (6 visits in total);
- Vantage point surveys in 2010/11 (117 hours), 2013/14 (66 hours) and 2015/16 (81 hours) recording flight activity within 500m of the proposed turbines sites;
- NVC and GWDTE survey in 2013;
- Protected mammals reconnaissance survey in 2013;
- Otter and Pine Marten surveys in 2014;
- Bats and herptiles surveys (April-June 2015).

These initial surveys will be supplemented by a suite of surveys for the extended site area that includes Kirk Wood.

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

No ecological designations cover the site area. However, within 20km of the proposed development, there are sites with international and national ecological and ornithological designations. The sensitivities of each of the designated sites will be considered to inform the assessment. A list of the designated sites identified, and their qualifying features are provided in the tables below. Figure 3 also illustrates the location of designations located within 10km of the site.

Table 6: Summary of ecological designations within 20km of Cogle Moss wind farm

Site Name	Designation	Distance to wind turbine development (km)
Loch of Winless	SSSI	1.1
Moss of Killimster	SSSI	1.7
Caithness and Sutherland Peatlands	RAMSAR, SPA, SAC	1.7
Loch Watten	SSSI, SAC	2.5
Caithness Lochs	RAMSAR, SPA	2.5
Wick River Marshes	SSSI	3.5
Shielton Peatlands	SSSI	3.6
Loch of Wester	SSSI, SAC	4.6
Loch of Wester	SSSI	4.6
Stroupster Peatlands	SSSI	6.4
Lower Wick River	SSSI	6.5
Loch Scarmclate	SSSI	8.1
Olidett	SSSI	9.3
Spittal Quarry	SSSI	9.8
Banniskirk Quarry	SSSI	10.2
Loch of Durran	SSSI	10.2
Loch Heilen	SSSI	10.9
Castle of Old Wick to Craig Hammel	SSSI	11.3
East Cliffs Cliffs	SPA	11.3
Long Berry Coast	SSSI	11.4
Easy Caithness Cliffs	SAC	11.5
Dunnet Links	SSSI	11.9
Achanarras Quarry	SSSI	12.0
Thrumster Mill Loch	SSSI	12.0
Craig Hammel ot Sgaps Geo	SSSI	12.6
Leavad	SSSI	13.4
Blar nam Faoileag	SSSI	13.4
Phillips Mains Mire	SSSI	13.8
North Caithness Cliffs	SPA	13.9
Hill of Warehouse	SSSI	14.5
Weydale Quarry	SSSI	15.3
Westerdale Quarry	SSSI	15.7
Dunnet Head	SSSI	15.9
Coire na Beinne Mires	SSSI	16.1
Loch of Mey	SSSI	16.1
Duncansby Head	SSSI	16.2
River Thurso	SSSI, SAC	16.5
Strathmore Peatlands	SSSI	17.5
Loch Calder	SSSI	18.8
Dunbeath to Sgaps Geo	SSSI	19.0
John o' Groats	SSSI	19.4
Pennylands	SSSI	19.8

Table 7 – Qualifying interests of Special Protection Areas (SPAs) within 20km of the proposed development that have potential to interact with wind turbines. Species where the known core foraging range is greater than the distance from the proposed turbine are highlighted in red.

Site Name (and distance from development)	Qualifying Interest	Core foraging range
North Caithness Cliffs (14.7km)	Fulmar (<i>Fulmarus glacialis</i>), breeding	n/a
	Kittiwake (<i>Rissa tridactyla</i>), breeding	n/a
	Guillemot (<i>Uria aalge</i>), breeding	n/a
	Puffin (<i>Fratercula arctica</i>), breeding	n/a
	Razorbill (<i>Alca torda</i>), breeding	n/a
	Peregrine (<i>Falco peregrinus</i>), breeding	2km
East Caithness Cliffs (11.6km)	Cormorant (<i>Phalacrocorax carbo</i>), breeding	n/a
	Shag (<i>Phalacrocorax aristotelis</i>), breeding	n/a
	Fulmar (<i>Fulmarus glacialis</i>), breeding	n/a
	Great black-backed gull (<i>Larus marinus</i>), breeding	n/a
	Herring gull (<i>Larus argentatus</i>), breeding	n/a
	Kittiwake (<i>Rissa tridactyla</i>), breeding	n/a
	Guillemot (<i>Uria aalge</i>), breeding	n/a
	Puffin (<i>Fratercula arctica</i>), breeding	n/a
	Razorbill (<i>Alca torda</i>), breeding	n/a
Peregrine (<i>Falco peregrinus</i>), breeding	2km	
Caithness and Sutherland Peatlands (1.6km)	Black-throated diver (<i>Gavia arctica</i>), breeding	10km
	Red-throated diver (<i>Gavia stellata</i>), breeding	8km
	Common scoter (<i>Melanitta nigra</i>), breeding	n/a
	Wigeon (<i>Anas penelope</i>), breeding	n/a
	Golden eagle (<i>Aquila chrysaetos</i>), breeding	6km
	Hen harrier (<i>Circus cyaneus</i>), breeding	2km
	Merlin (<i>Falco columbarius</i>), breeding	5km
	Golden plover (<i>Pluvialis apricaria</i>), breeding	3km
	Greenshank (<i>Tringa nebularia</i>), breeding	2km
	Wood sandpiper (<i>Tringa glareola</i>), breeding	n/a
	Dunlin (<i>Calidris alpina schinzii</i>), breeding	0.5km
	Short-eared owl (<i>Asio flammeus</i>), breeding	2km
Caithness Lochs (2.6km)	Greenland white-fronted goose (<i>Anser albifrons flavirostris</i>), non-breeding	8km
	Greylag goose (<i>Anser anser</i>), non-breeding	20km
	Whooper swan (<i>Cygnus cygnus</i>), non-breeding	5km

4.5.4 Proposed Methodology

It is considered that the historic surveys for the permitted scheme provide an adequate baseline to inform the ecological and ornithological assessment of all wind turbines and infrastructure located within the previous application boundary.

The additional forestry area (Kirk Wood) to the east of the previous application boundary, which includes the proposed location for three wind turbines and sections of access track, will be subject to the following surveys in 2018 (taking in to account SNH guidance):

- Breeding bird surveys (within 500m of proposed development);
- Raptor and diver surveys (within 2km of proposed development)
- NVC and GWDTE survey (within 500m of proposed development);
- Protected mammals surveys, including Pine Marten, Otter and Bats (within 500m of proposed development).

It is not proposed to undertake further vantage point surveys, due to the coverage of those carried out for the permitted scheme, consideration of the survey results for the permitted scheme, and the characteristics of the conifer plantation forestry that covers the additional site area. Surveys for the permitted scheme cover the majority of the additional site area (illustrated in Figure 6), with the forestry providing a less attractive environment for most target species. Flight activity can be seen to be fairly irregular across the site, with no indication that bird activity across Kirk Wood differs significantly from moorland area to the west. Further, the forestry was planted in 1980 and it is therefore the intention of the landowner to fell the existing forestry in the next few years, which would affect the relevance of any vantage point survey results collected prior to this undertaking. Instead, for the purposes of collision risk modelling, it is proposed that a worst-case scenario is assumed based on the survey results for the permitted scheme. For the small area of Kirk Wood that is not covered by historical vantage point surveys, it would be assumed that bird activity is similar to the open moorland to the west, which provides a more attractive environment for most target species.

Confirmation is sought from SNH regarding the suitability of the proposed level of survey work outlined above.

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 THC before submission of the EIA Report.

4.6 Hydrology

4.6.1 Background

This assessment will consider the effects of the proposed development 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.

4.6.2.1 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;
- 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:

- An updated desk-based survey to assess the baseline site hydrological features and identify any Private Water Supplies;
- 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;
- A detailed peat survey will be required, and this will comprise of the following:

- 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.
 - 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 Baseline

Baseline surveys were undertaken for the permitted scheme. These surveys will inform the parts of the proposed development site to which they are relevant. Further surveys will be used to inform the baseline for areas that were omitted from the initial surveys.

4.6.5 Potential Mitigation Measures

There is potential for a variety of impacts to hydrology as a result of the proposed development, 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 after construction.
- 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 proposed 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 THC before the process commences.

4.7 Cultural Heritage and Archaeology

4.7.1 Background

This section will consider the potential effects of the proposed development 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 8) 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 9 and 10). In the EIA Report, this distance would be increased to 10km.

Table 8 All archaeology and cultural heritage assets within wind farm site boundary

Site Name	Site Type	Distance from Closest Turbine
N/A	N/A	N/A

Table 9 Scheduled Ancient Monuments within 5km of wind farm site

Site Name	Distance from Closest Turbine (km)
Kirk o'Moss, site of St Duthac's Chapel, Moss of Killimster	0.8
Bilbster, chambered cairn 1040m NNE of Bylbster Bridge	1.0
Gearsay Cairn, broch 240m SW of West Gersa	1.3

Scottag Cairn	1.5
North Bilbster, standing stone 120m W of	1.9
Nether Banks, broch 220m NNE of	3.7
Lynegar, cairn 610m NE of	3.9
Grey Cairn, broch 475m SE of Lynegar	4.0
Green Hill, broch 300m W of Mordwall	4.2
Green Hill, broch, West Watten	4.3
Oslie, chambered cairn S of Lynegar	4.4
Cairn of Heathercow, long cairn, Brabster Moss	4.6
Ring of Castlehill, for 380m SW of Summer Byres	4.9
Strath, cairn and hut circles 1070m S of	5.0

Table 10 Listed buildings within 5km of wind farm site

Site name	Category	Distance from closest turbine
Watten Mains	Category B	1.9
Bilbster House	Category C	2.3
Achingale Bridge over the Wick River	Category B	3.3
Watten Crossroads, Thor House	Category C	3.5
Achingale Mill	Category A	4.0

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

4.7.4 Potential Mitigation Measures

The best mitigation is likely to be through good design which avoids or minimises effects to an acceptable degree.

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 THC guidance all properties within 1012m (11 x rotor diameter) 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

There are a number of residential properties that are located at distances of less than 1012m from the nearest proposed wind turbine (associated with the proposal). Each of these properties will be included in a shadow flicker assessment, which will include calculations of if and when (time and duration) shadow flicker effects are predicted for each property. If shadow flicker effects are predicted, then mitigation will be agreed with THC to ensure that no effects occur at the residential property.

4.8.4 Potential Mitigation Measures

In the event that shadow flicker effects are predicted to occur at a residential property, it is possible to programme the relevant wind turbine/s to shut down at these times. This mitigation method is deemed acceptable by THC.

4.9 Existing Infrastructure, Telecommunication Television, Aviation and Electromagnetic Safety

4.9.1 Background

This chapter will assess the possible effects of the proposed development at Cogle Moss 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.

4.9.2 Proposed Methodology

Consultation requests are being submitted to the main aviation, communication and utilities organisations identified as potentially affected by the proposed development. A table with the consultees responses will be included in the EIA Report. An updated assessment will be submitted to Highlands and Islands Airports Ltd. to ensure that there will be no effects to Wick Airport.

4.9.3 Preliminary Baseline

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

4.9.4 *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.

4.10 *Other Issues*

4.10.1 *Socio-economic Effects*

The proposed development 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.

4.10.2 *Traffic, Transport and Access*

Wynns Ltd undertook a transport and access assessment to show the feasibility of the various access routes to the wind farm. This assessment will be updated to account for the increased size of the proposed wind turbine components.

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:

ePlanning Centre
Glenurquhart Road
Inverness
IV3 5NX

E-mail: ePlanning@highland.gov.uk

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

FAO Angus Elder
Cogle Moss 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.

FIGURE 1

Site context

Scale: 1:50,000

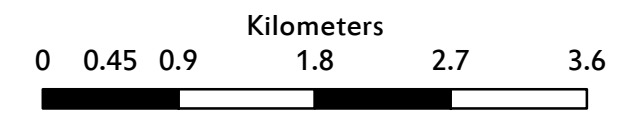
Checked by: AF

Drawn by: AE

Date: 03/05/2018

Key:

- Cogle Moss wind turbine
 - Wind turbine
 - Cogle Moss site boundary
 - Consented wind farm
 - Operational wind farm
 - Scoping wind farm
 - VP Viewpoint locations
- 1 - Watten Caravan Park
 - 2 - B876, Black Hill
 - 3 - B870, Quoybrae
 - 4 - B876, Reiss
 - 5 - A882, Bylbster
 - 12 - A882, West Watten
 - 13 - A99, Keiss
 - 18 - A882, Stirkoke House
 - 19 - A882, Milton



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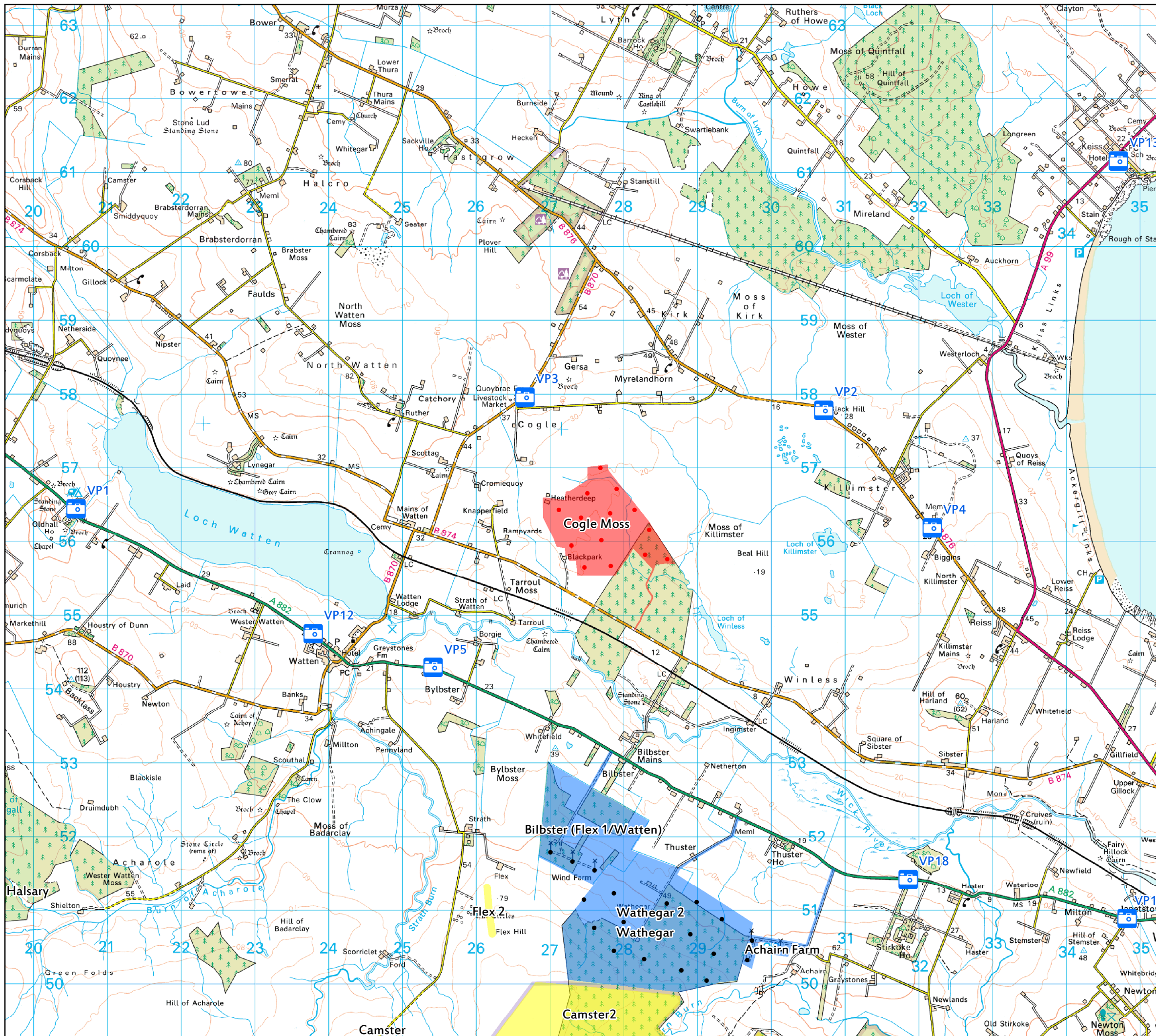


FIGURE 2

Proposed development layout with permitted scheme

Scale: 1:10,000

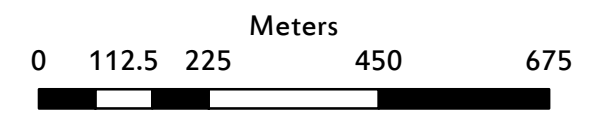
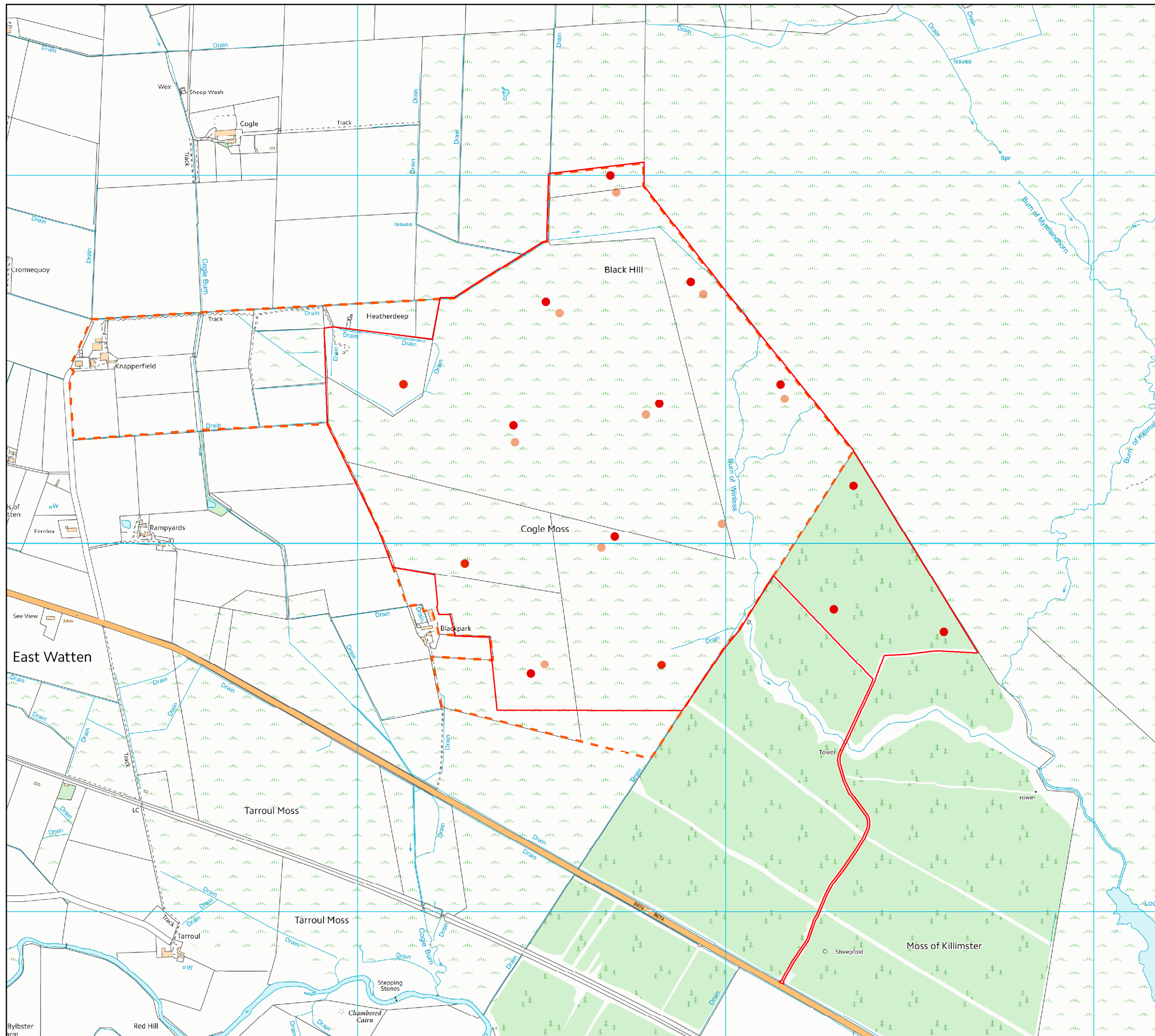
Checked by: AF

Drawn by: AE

Date: 16/05/2018

Key:

- Proposed wind turbine
- Permitted wind turbine
- Proposed development boundary
- Permitted scheme boundary

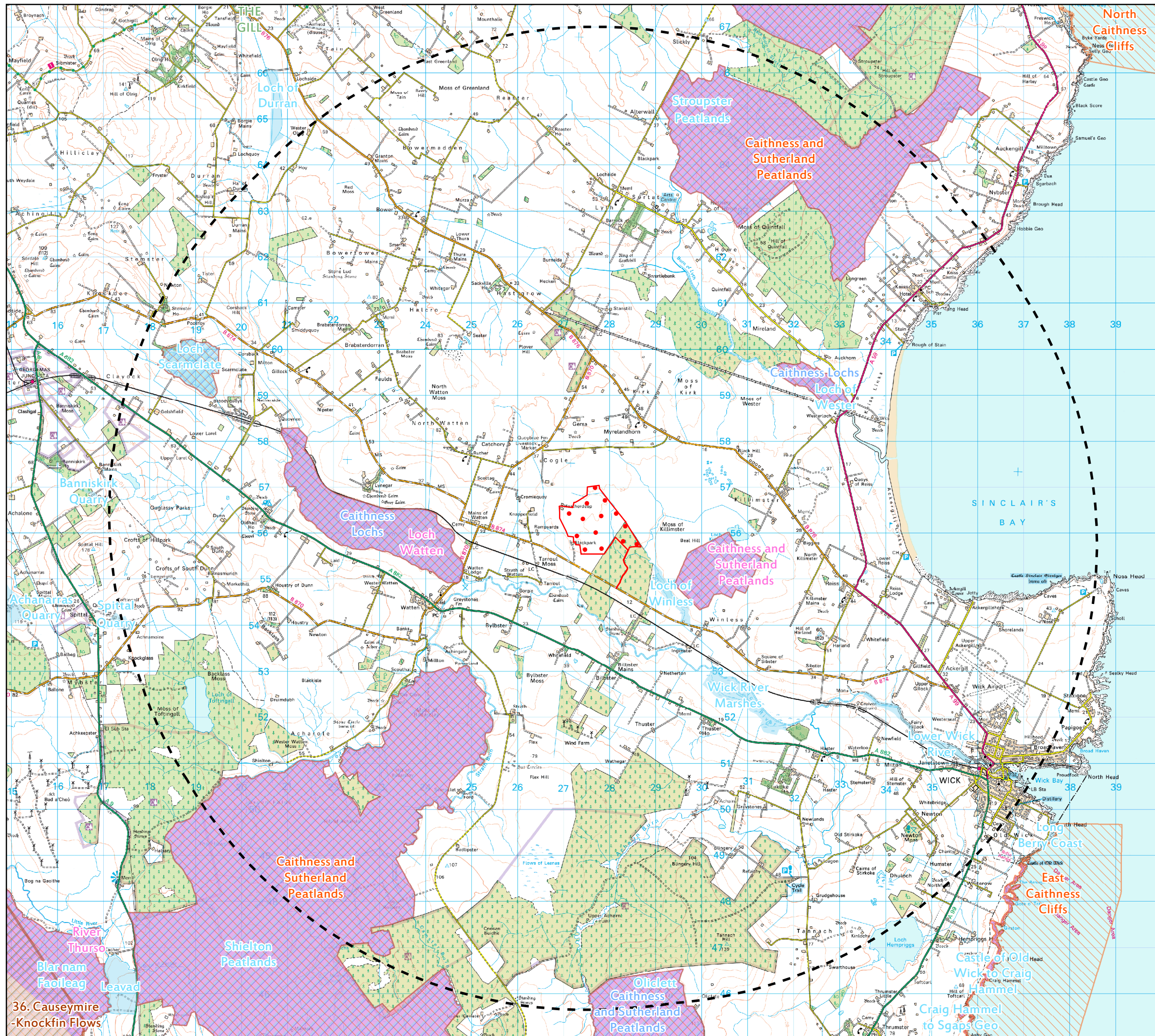


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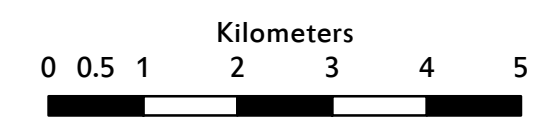
PROJECT: COGLE MOSS WIND FARM

CLIENT: COGLE MOSS RENEWABLES LLP

FIGURE 3
Environmental designations

Scale: 1:80,000 Checked by: AF
Drawn by: AE Date: 15/05/2018

- Key:**
- Cogle Moss wind turbine
 - Proposed development boundary
 - 10km buffer ring
 - Wild Land Area
 - Special Landscape Area
 - National Nature Reserve
 - Special Protection Area
 - RAMSAR
 - Special Area of Conservation
 - Site of Special Scientific Interest
 - Ancient Woodland Inventory



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FIGURE 4

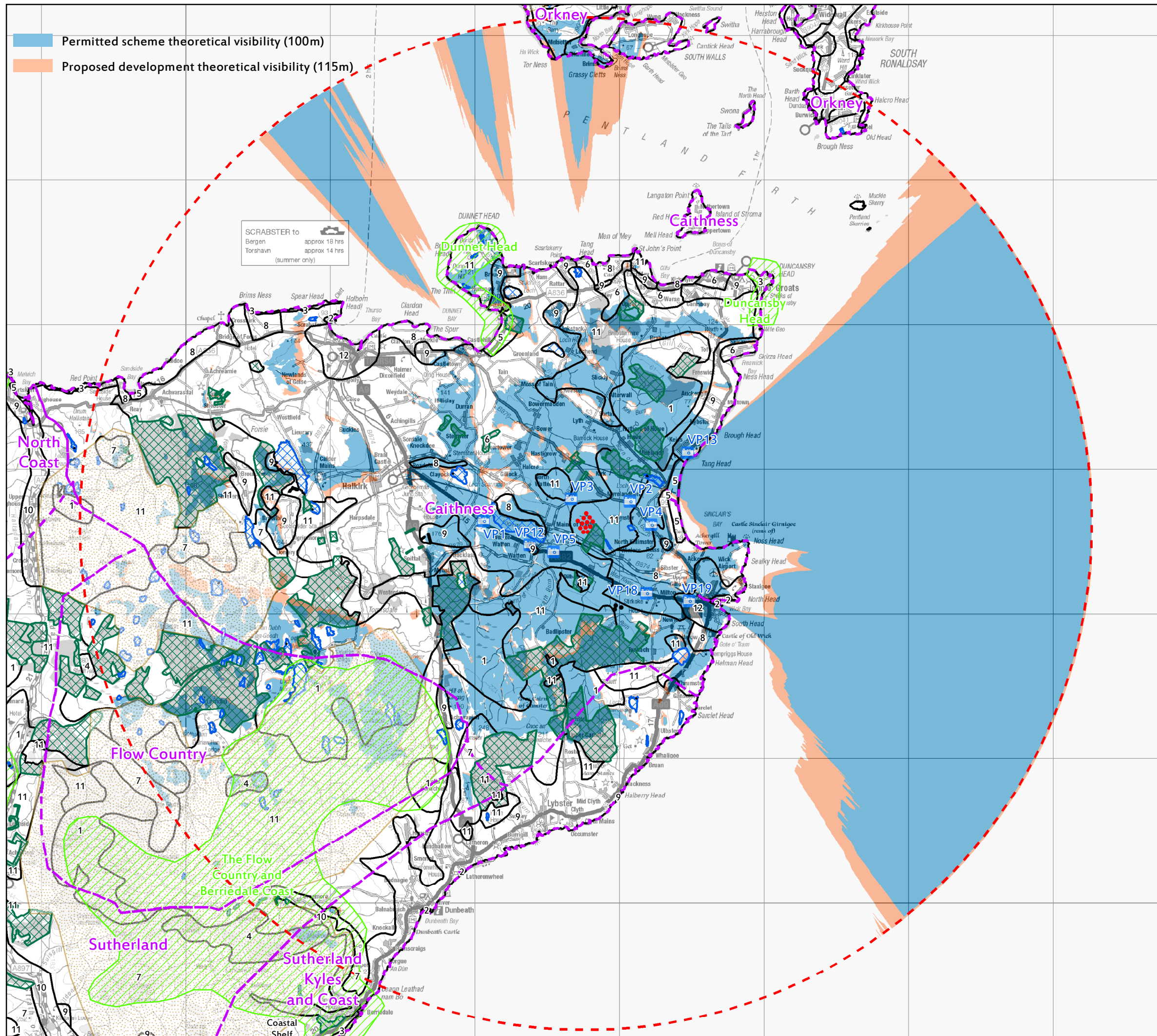
Comparative blade tip ZTV with defined landscape areas (35km)

Scale: 1:255,000

Checked by: AF

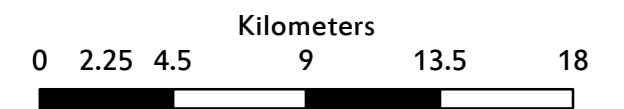
Drawn by: AE

Date: 03/05/2018



Key:

- Cogle Moss wind turbine
- Landscapes of Scotland
- Landscape Character Areas
- Coniferous Woodland Plantation
- Inland Loch
- Landscape Character Type
 - 1 - Flat Peatland
 - 2 - Harbour
 - 3 - High Cliffs and Sheltered Bays
 - 4 - Lone Mountains
 - 5 - Long Beaches Dunes and Links
 - 6 - Mixed Agriculture and Settlement
 - 7 - Moorland Slopes and Hills
 - 8 - Open Intensive Farmland
 - 9 - Small Farms and Crofts
 - 10 - Strath
 - 11 - Sweeping Moorland
 - 12 - Town
- Special Landscape Area
- Wild Land Area
- Viewpoint locations
 - 1 - Watten Caravan Park
 - 2 - B876, Black Hill
 - 3 - B870, Quoybrae
 - 4 - B876, Reiss
 - 5 - A882, Bylibster
 - 12 - A882, West Watten
 - 13 - A99, Keiss
 - 18 - A882, Stirkoke House
 - 19 - A882, Milton



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FIGURE 5

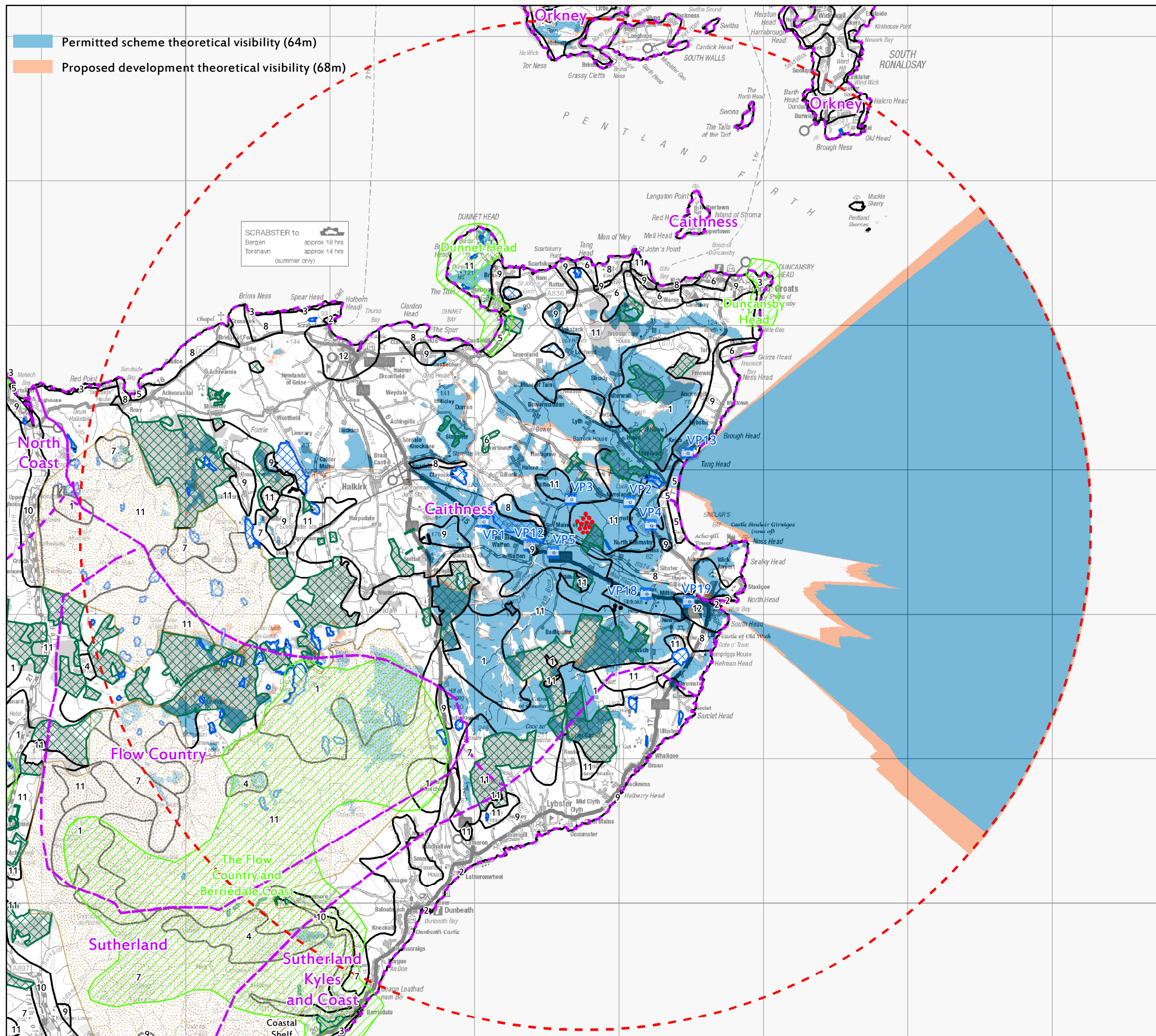
Comparative hub ZTV with defined landscape areas (35km)

Scale: 1:255,000

Checked by: AF

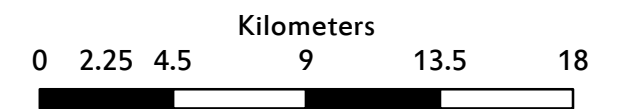
Drawn by: AE

Date: 16/05/2018



Key:

- Cogle Moss wind turbine
- Landscapes of Scotland
- Landscape Character Areas
- Coniferous Woodland Plantation
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FIGURE 6

Vantage point survey coverage

Scale: 1:10,000

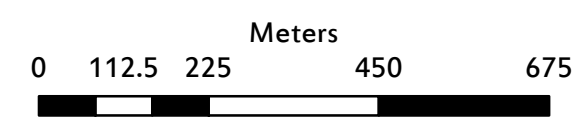
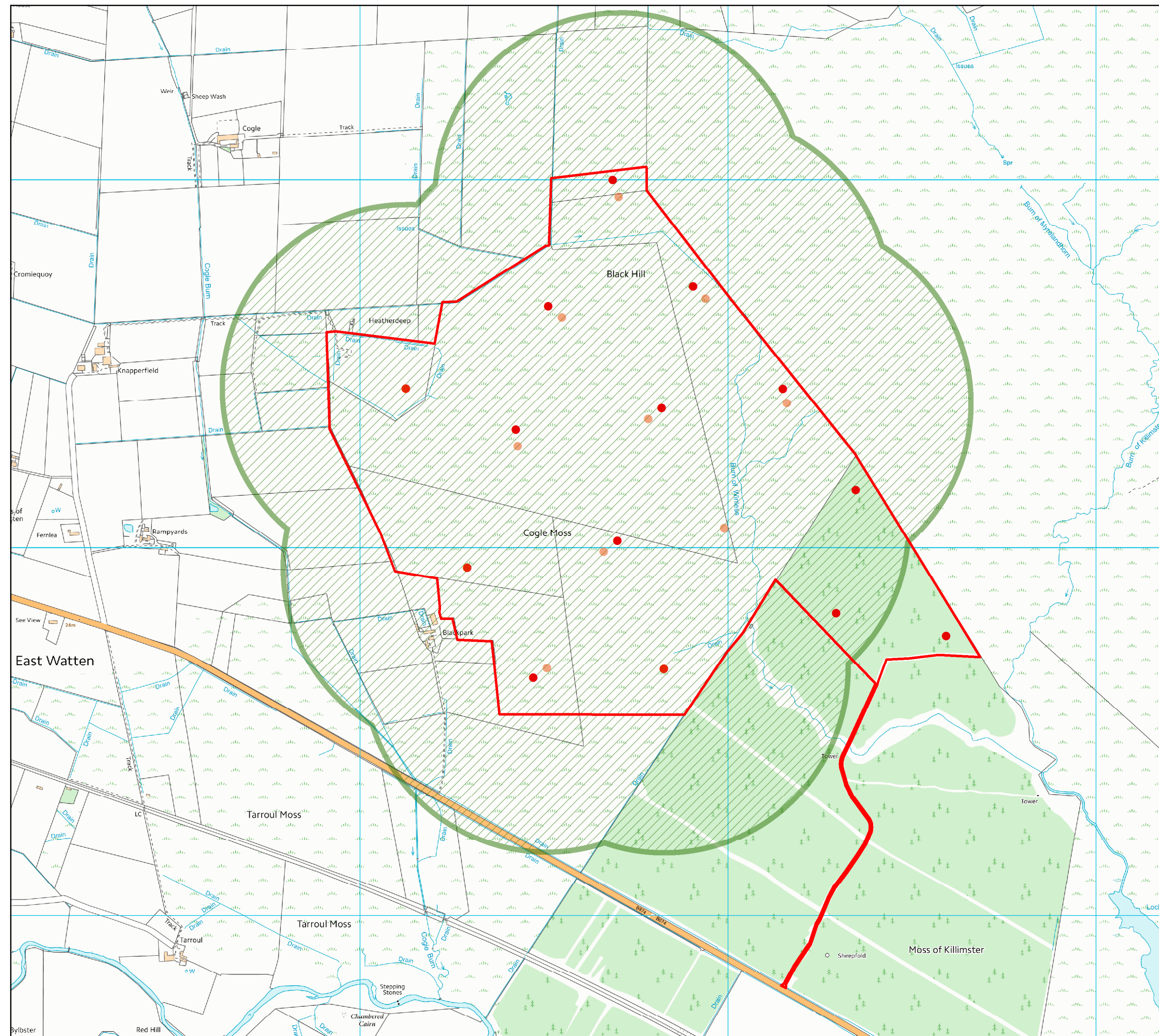
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Drawn by: AE

Date: 21/09/2017

Key:

- Proposed wind turbine
- Permitted wind turbine
- Proposed development boundary
- Permitted scheme survey coverage



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