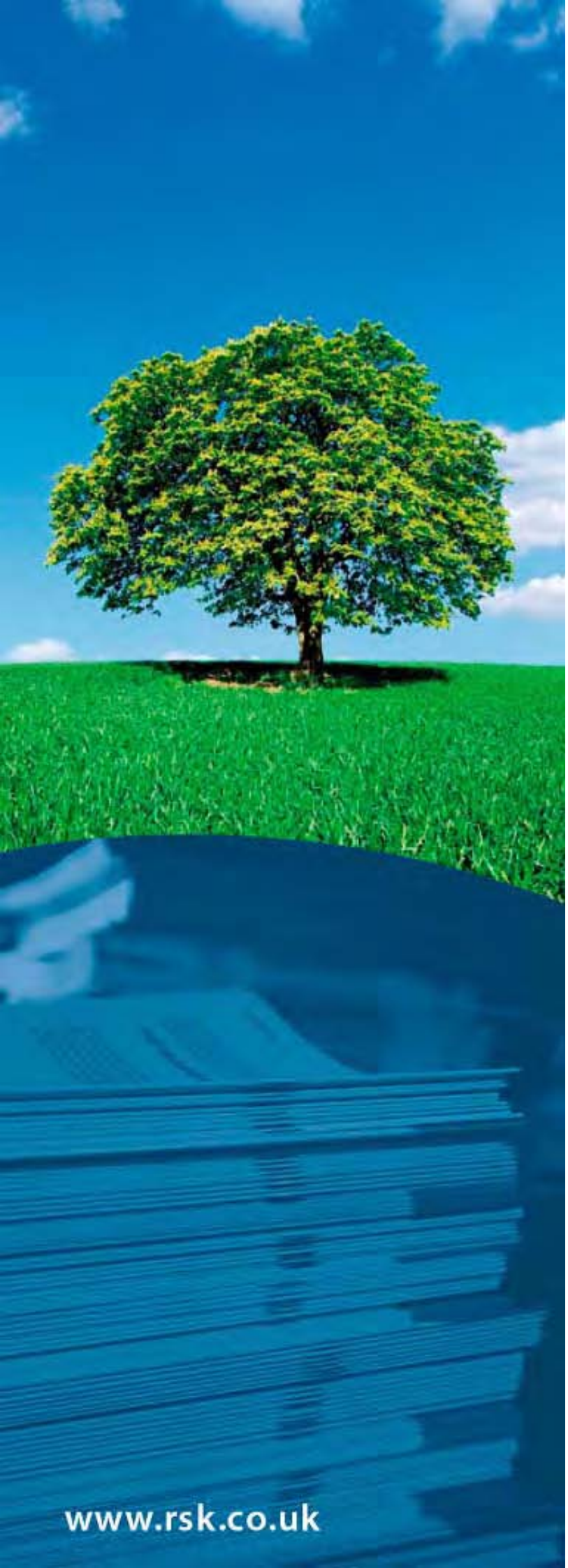

RSK GROUP PLC

Force 9 Energy LLP

Blackwood Wind Farm

Scoping Report

P190282

May 2011

Safeguarding your business environment

RSK GENERAL NOTES

Project No.: 190282/06/01/01 Rev03

Title: Blackwood Wind Farm Scoping Report

Client: Force 9 Energy LLP

Date: May 2011

Office: Glasgow

Author	_____	**Technical reviewer**	_____
Date:	_____	Date:	

Project manager _____

Date: _____

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1 INTRODUCTION

1.1 Background

Force 9 Energy LLP (Force 9 Energy) is a dedicated wind farm development company based in and with a focus on the UK market. To date Force 9 Energy has taken 6 developments through planning, three of which will have been consented without appeal or Public Inquiry, one of which was consented on appeal, one which is awaiting determination and one of which was refused after public inquiry. Force 9 Energy is continuing to expand its wind farm development portfolio in response to the Government's targets for energy generation from renewable sources

Force 9 Energy is proposing to submit a planning application on behalf of EDF for the construction and operation of an onshore wind farm on Blackwood Estate, High Auldgirth, Near Auldgirth, Dumfries and Galloway approximately 15km north of Dumfries (see Figure 1).

Force 9 Energy has a joint development agreement with EDF Energy Renewables (EDF). Through the agreement Force 9 Energy leads on the development process of wind farm proposals up to the start of construction. Should a windfarm be consented EDF will take the lead during construction and subsequently own and operate the wind farm. Force 9 Energy is supported by EDF both financially and with staff resources requested by Force 9 on issues such as grid studies, access studies and public relations.

RSK Environment Ltd (henceforth RSK) was commissioned to carry out an Environmental Impact Assessment process for the Blackwood project and this report forms the initial part of that process, being a scoping request for the development.

1.2 Requirements of the Legislation

Under the Town and Country Planning (Scotland) Act 1997, as amended, consent to construct and operate the wind farm is required from the relevant planning authority for electricity generation projects that fall below 50 Megawatts (MW). Whilst the precise number of turbines that will operate at Blackwood is not known at the time of writing, it

is unlikely that the development will exceed 50MW of generating capacity and therefore likely that an application to Dumfries and Galloway Council will be required.

The Environmental Impact Assessment (Scotland) Regulations 1999 (the 1999 regulations), as amended, require an Environmental Impact Assessment (EIA) to be undertaken if the relevant planning authority considers that the proposals have the potential to have a significant effect on the environment. In this case, in recognition of the scheme's scale and nature, Force 9 Energy is seeking to undertake an EIA in support of the application to inform the potential for environmental effects and thereby to inform scheme design.

Whilst not a statutory requirement, as part of the EIA process, Force 9 Energy wishes to seek a formal scoping opinion from Dumfries and Galloway Council under the provisions of Regulation 10 of the 1999 Regulations. This document is the Scoping Report, which contains the necessary information as required under Regulation 10 of the 1999 Regulations.

The proposed Blackwood Wind Farm is likely to be classed as a "local development" under paragraph 4, Regulation 2(1) of the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009. Based upon current proposals, statutory pre-application consultation (PAC) with local communities prior to the submission of a planning application would therefore not apply to this development. Nevertheless, Force 9 Energy intends to carry out local consultation and report on this in support of its planning application.

1.3 The Scoping Process

Scoping is undertaken in order to refine the scope of the assessment of environmental impacts and ensure that it is robust in its approach. This will be achieved by inviting the relevant planning authority and consultees to:

- Specify aspects of the environment and issues relating to these that should be considered and addressed in the EIA (with particular emphasis on any issues local to the site);
- Comment on the proposed approach to the EIA;
- Comment on or recommend, where appropriate, assessment methodologies; and
- Highlight other relevant bodies or organisations that may have a vested interest in the scheme or be able to provide relevant information.

Once the Scoping Opinion has been received by RSK (see Section 4 for contact details), the response will be analysed and the relevant points raised taken forward and used to inform the assessment process.

1.4 Document Structure

In accordance with Regulation 10 of the 1999 Regulations, when making a scoping request the developer is required to include:

- "*A plan sufficient to identify the land*" (*Section 1*);
- "*A brief description of the nature and purpose of the development*" (*Section 2*);
- *A description of the development's "possible effects on the environment*" (*Section 3*); and
- "*Such other information or representations as the person making the request may wish to provide or make*" (*Sections 2 and 3*).

These requirements are addressed in this scoping report as indicated above. Section 4 relates to the procedure for making comments in relation to this scoping exercise. Appendix 1 contains the relevant maps and figures, which are referred to within the relevant sections.

2 PROJECT DESCRIPTION

2.1 Background

This section describes the proposed Blackwood Wind Farm development. A brief description of the site and surroundings is given followed by a description of the components of the scheme. Figure 1 shows the location and boundary of the area under option (project area) and a provisional layout for the development. It should be noted that beyond scoping the design of the development will evolve to take account of constraints and issues raised during scoping, through baseline studies both completed and currently in progress, and through the subsequent iterative assessment of impacts.

2.2 Site Description

The proposed Blackwood Wind Farm (NX 928 885) is located in the Nith Valley at High Auldgirth, Near Auldgirth, Dumfries and Galloway approximately 15km north of Dumfries. It is bounded to the north by Clauchrie Plantation, to the east by Fern Hill and to the south by Mullach Hill. Auldgirth lies within the southwestern corner of the site boundary. The site lies adjacent to the existing Dalswinton Wind Farm, which is situated in the Dalswinton Estate to the east of the proposed site. The land proposed for the wind farm development is under single ownership.

The area within which elements of the proposed Blackwood Wind Farm may be located will be referred to as “the project area” within this document, and is delineated in red in Figure 5.

The project area consists primarily of rough, semi-improved grassland and conifer plantation with a small stand of deciduous woodland in the north of the site and another in the south west of the site, close to Auldgirth. It has its highest point lying in the north of the site close to Muirstraploch Wood, at approximately 244m above ordnance datum (AOD), and the lowest point along the south western boundary, at approximately 35m AOD, at Auldgirth. Notable peaks within the project area include Blackcraig Hill (242m AOD). There is one disused quarry within the boundary of the project area with a further three in very close proximity. Access to the site is yet to be confirmed but is likely to lead from the A76 at Auldgirth via the unclassified road to Lower Auldgirth, whereby a new access track will be constructed to High Auldgirth to ensure site gradients for turbine delivery vehicles are within acceptable limits.

Watercourses within the west of the project area mainly drain into the River Nith and into Pennyland Burn and Brandy Burn (tributaries of the Nith) from the remainder of the site.

2.3 Project Components

2.3.1 Summary of Key Components

The principal components of the wind farm comprise the following:

- Wind turbines, number currently undetermined but likely to be up to six, each with a capacity of up to 3MW. It is expected that the height to tip will be a combination of 120m and up to 150m depending upon location within the terrain.
- Permanent anemometer mast(s);
- Permanent access tracks to gain access to the site and between the turbines;
- A grid connection building and site office.

An electricity transmission line from the site to the local electricity distribution network will also be required, and will be applied for separately by ScottishPower Power Systems. The likely connection location is Dunscore. In addition, a temporary construction compound and one or more borrow pits would be required on site for the purposes of construction. Each of these elements is considered in more detail below. Whilst the following information is a description of the likely construction process, it cannot be guaranteed and individual design may vary.

2.3.2 Wind Turbines

The exact number of wind turbines will be determined by how many the site will sensibly support, based on environmental and physical constraints identified during the EIA and design process. The height of each turbine will also be determined as the design process progresses.

It is anticipated that each turbine foundation will require an excavation down to the underlying rock. The detailed design specification for each foundation will depend on the type of turbine procured, and the specific ground conditions at the location of each turbine.

Wind turbines are likely to have external transformers located in kiosks adjacent to each turbine.

2.3.3 Anemometer Mast(s)

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

These should not be confused with the temporary anemometer mast that will be employed on the site before any planning consent or construction of the wind farm, and which will be subject to a separate planning application. As with turbine locations, the exact location of the anemometer mast(s) have yet to be finalised, as these will depend on the type of turbine that will be used and the constraints identified during scoping and the iterative assessment. The anemometer mast(s) height will be identical to turbine tower heights. The selection of the mast will take account of the ease of construction and ability to reduce visual impact. Access to the anemometer mast(s) would connect with the main network of site tracks (see below).

2.3.4 Access to Site and Internal Tracks

Access to the site for vehicles delivering turbine components, such as tower sections and blades, is likely to be from the unclassified road which joins the A76 near Auldgirth in the southwest of the site.

The design of public road junctions and use of signage will be developed to meet the requirements of the relevant authorities with regard to visibility, construction materials, surface water drainage, gradient and safety of other road users.

The exact route of the internal access roads is yet to be determined but the preference is to run from just to the north of where the unclassified road to Lower Auldgirth crosses the railway line. Existing roads and tracks within the site will be used where possible although it is clear that new internal access roads will also be required. The access will be gated to prevent unauthorised vehicle access to the turbine site. Provision for pedestrian access, however, will be maintained subject to health and safety restrictions during construction.

The tracks will be used by construction vehicles and will be retained throughout the lifetime of the windfarm for use by maintenance vehicles. The width of the tracks will be approximately 5m, although may be wider for short sections, such as at passing places, lay down areas and sharp bends. The surface of the tracks will have a cross fall in order to drain run-off into ditches on the downhill side of the track where necessary, and lateral and cross drains will also be installed where required. Outlets will be suitably located with erosion protection as required.

2.3.5 Burn Crossings

The site contains a number of watercourses (see Section 3.2.4.1). It is possible, therefore, that watercourse crossings may be required on site to facilitate access to the turbines and ancillary development (site offices, anemometer mast, etc).

New crossings will be designed in accordance with Scottish Government best practice and taking due regard of Scottish Environment Protection Agency (SEPA) best practice

guidelines to enable the passage of fish and other wildlife. Any upgrades to existing water crossings that are required will also comply with Scottish Government and SEPA best practice.

Suitable licences under the Water Environment (Controlled Activities) regime will be sought for all works within or adjacent to watercourses.

2.3.6 Grid Connection, and Operations Control Building

Cables from the wind farm will be collected at the grid connection building that will incorporate the switchgear and metering equipment. In addition to the grid connection equipment, a control and metering room, telecommunications equipment, an office, and welfare facilities for visiting staff will be housed. A small car parking area adjacent to the building will also be formed. The grid connection building would comply with the Electricity Safety, Quality and Continuity Regulations 2002, particularly with regard to the installation of safety signs. . A location for the grid connection building has yet to be determined and will be informed by the technical requirements of the gird connection and the EIA process.

2.3.7 Internal Cabling

All power and cabling on site from and between the wind turbines will be buried in trenches largely located directly adjacent to the internal tracks. The design of cable crossings of watercourses will be agreed with Dumfries and Galloway Council and SEPA.

2.3.8 Borrow Pits

The project will require some crushed stone to construct new tracks, create hard standing areas for the cranes and lay the foundations. The source of this stone will be considered during the evolution of the site design and impact assessment. A preliminary site investigation prior to construction will be required to establish the quality of the sub-grade and site rock, and the sources and quantity of road stone estimated.

If the stone is suitable, before the excavation of the borrow pits, topsoil will be removed and stored in a mound for use in reinstatement. Following extraction of stone, the floor of the pits will be built up with surplus material excavated during the construction of the access tracks, turbine foundations and hardstanding areas, and the side slopes will be graded to a safe angle to integrate the landform with the adjacent landscape.

2.3.9 Construction Compounds and Work Areas

During the construction period, a construction compound will be required that will include a laydown area. The main construction site office and compound will comprise temporary cabins to be used for the site offices, the monitoring of incoming vehicles and welfare facilities for site staff including toilets; parking for construction staff, visitors and

construction vehicles; secure storage for tools and small parts; a receiving area for incoming vehicles; and security fencing around the compound.

The compound will be used as a storage area for the various components, fuels and materials required for construction. The major structural components of the turbines would be delivered directly to site. Temporary lay-down areas will be provided for parking and unloading delivery vehicles and, in particular, abnormal loads.

The location of a construction compound has not yet been determined and will be informed by the EIA process.

3 ENVIRONMENTAL IMPACT ASSESSMENT SCOPE

3.1 Overall Approach

The EIA will be conducted in accordance with the requirements of the 1999 Regulations. The following key stages will form the basis of the assessment process:

- Consultation with statutory and non–statutory bodies and relevant stakeholders;
- Establishing a robust baseline of the existing environment on and around the site;
- Assessment of the environmental impacts and establishing their significance (primarily the assessment of residual effects once mitigation has been adopted); and
- Formulation of mitigation measures to ameliorate the potential impacts of the proposed development that cannot practically be avoided through site design.

Following established best practice, it is intended that the design of Blackwood Wind Farm will evolve in an iterative manner with the assessment process, led mainly by the consideration of constraints that exist within and around the site (environmental, technical and economic). Once the preferred design is selected, then this will form the basis of the impact assessment. Three key components of the assessment process are summarised below.

3.1.1 Consultation

Consultations with relevant authorities, organisations and stakeholders will be undertaken throughout the EIA and site design process, commencing with scoping. The consultations will serve four main purposes:

- To establish a sufficiently robust environmental baseline of the site and its surroundings;
- To identify, early in the process, specific concerns and issues relating to the site and development in order that they can be discussed and accounted for appropriately in the design and assessment;

- To ensure appropriate involvement of the public and authorities in the assessment and design process; and
- To fulfil Force 9's obligations under *Environmental Impact Assessment (Scotland) Regulations 1999*, as amended, and *Town and Country Planning (Scotland) Act 1997*, as amended.

Force 9 Energy intends to carry out community consultation with public exhibitions and circulars and would welcome comments on how the community and other stakeholders would prefer to be consulted.

The outcome of the consultation process will be compiled into an Environmental Statement (ES) with the planning application detailing the consultation undertaken and any changes made to the proposal as a result.

3.1.2 Baseline

For each environmental aspect under consideration for the EIA, the environmental baseline of the site and its surroundings will be established (see Section 3.2 below). This will be achieved through consultations with relevant authorities and organisations, a desktop review of available data including that generated from consultations (see Figure 2), and completion of specialist field surveys.

For all environmental aspects, the significance of residual impacts i.e. those predicted once mitigation is taken account of, will form the basis of the assessment. An outline of the proposed methods of assessment for each environmental topic is provided in Section 3.2 below.

3.1.3 Development of Mitigation Measures

Due to the proposed 'constraints-led' iterative evolution of the site design for this development, most mitigation measures are considered likely to be embedded within the design of the site rather than as 'add-on' measures to ameliorate significant environmental effects. The evolution of the design, therefore, will be reported clearly in the ES, including the rationale behind the preferred choice of development design.

All other measures proposed as mitigation for the development will be reported within the relevant section of the ES. The mechanism by which these measures will be carried through to implementation on site will also be made clear.

3.2 Environmental Aspects to be Assessed

3.2.1 Background

This section identifies the environmental aspects that Force 9 Energy proposes to address within the EIA for the Blackwood Wind Farm. It discusses each aspect in terms of a brief summary of the environmental baseline for each (where practical), the relevant potential impacts and an overview of the proposed method of assessment for each one. It should be noted that each aspect will be assessed in the context of a defined study area that is informed by industry guidance, best practice and likely design of the wind farm. The extent of the study area is described in each case below.

3.2.2 Landscape and Visual Assessment

3.2.2.1 Preliminary Environmental Baseline

3.2.2.1.1 Introduction

The content of this scoping report is based on a documentary review and preliminary field assessment carried out in March 2011.

For the purpose of scoping, areas within 35km of the proposed development have been considered to meet the requirements of the specific project and its landscape context, and to reflect the likelihood of significant effects arising over long distances.

Figure 3 provides a preliminary hub and blade tip ZTV that has been prepared to the 35km study boundary radius, and is based on turbines with a blade tip height of both 120m and 140m. Although the proposed layout is not fixed, the preliminary scoping layout indicates that two different turbine heights may be used in the proposed wind farm in order to negotiate the varied topography, and maintain a reasonably consistent height between the turbine hubs. The ZTV shows that the visibility of the proposed wind farm may extend mainly to the northwest and southeast, along the Nithsdale Valley and to its surrounding hilltops. More distant areas with views of the potential wind farm would be predominantly to the east and generally in small pockets of high land surrounding Terregles ridge to the west, and the Lowther Hills to the north.

3.2.2.1.2 Project Area Description

The boundary of the potential project area is illustrated in Figure 1. This project area includes large areas of land for the purpose of access and that would not be subject to turbine development (all turbines would be sited on higher ground to the east of the defined project area).

The location of the proposed wind farm comprises an area of gently rolling pasture, featuring large field enclosures delineated by dry stone dykes. There are lines of both

coniferous and deciduous trees surrounding these fields, with the more extensive, coniferous Clauchrie Plantation located to the immediate north. To the east, the landscape pastures become rougher and unenclosed. There is an Iron Age fortification on the summit of Mullach (245m AOD) to the south. The rolling pasture continues to the southwest, and then steeply slopes downhill to the west towards the Nithsdale Valley.

The proposed Blackwood wind farm is located within 1km to the west of the operational wind farm at Dalswinton. The two wind farms would be located at similar elevations.

3.2.2.1.3 Landscape Character Context

The landscape character context has been established by published SNH landscape character assessment documents and GIS data sets. The 35km study area is encompassed wholly within the following landscape character assessment:

- SNH No 94 Dumfries and Galloway Landscape Assessment (Land Use Consultants, 1998)

Figure 4 illustrates the landscape character context of the proposed development showing all identified landscape character types within 35 km of the proposed turbines. The principal landscape character types that form the landscape context of the proposed development (within approximately 5 km of the project area) are:

- Type 6 Lower Dale;
- Type 7 Middle Dale;
- Type 16 Upland Fringe;
- Type 18 Foothills; and
- Type 18a Foothills with Forest; and,

The specific location identified for potential turbine development falls close to the boundary of:

- Type 16 Upland Fringe;
- Type 18a Foothills with Forest; and,
- Type 7 Middle Dale.

The project area is located predominantly within Type 16 Upland Fringe. The Upland Fringe landscape is characterised by elevated rolling pastures, featuring a mix of both rough and improved grassland. It is found throughout the Dumfries and Galloway region, and tends to form the most visible faces of the uplands. The access track and

four of the six preliminary turbine positions are located within this landscape character type.

A small section of the project area is located within Type 18a Foothills with Forest. The Foothills with Forest landscape is characterised by dark green blankets of forest, covering undulating foothills, and is generally found within the central and eastern parts of the Dumfries and Galloway region. Two of the six preliminary turbine positions are located within this landscape character type.

A small section of the project area is also included within Type 7 Middle Dale. The Middle Dale landscape is characterised by broad valleys with complex undulating topography and locally narrow sections. The start of the access track will be located within this landscape character type.

Guidelines outlining the capacity of each landscape character type to accommodate wind farm development have also been included within the Dumfries and Galloway Landscape Assessment. Comments include:

- Type 16 Upland Fringe: *"There is limited potential for wind farm development in this landscape type due to it high visibility from surrounding settled lowlands. Opportunities for small scale developments may exist above and behind main visual horizons in local depressions where maximum back clothing and screening effect could be gained."*
- Type 18a Foothills with Forest: *"Forested foothills may provide opportunities for topographic screening and back clothing with the added benefits of peripheral tree screens and the provision of forest access roads. The most suitable locations would be in the middle area of these landscapes below ridgelines, in depressions, basins or valleys where their influence on Scottish Uplands and Upland Fringe (and Lowland) landscapes would be minimised. The medium scale topography would suggest an appropriate size of wind farm to be up to 10 turbines. This would, of course, depend on the technical feasibility of siting in proximity to forest."*
- Type 7 Middle Dale: *"The flat and elevated nature of this landscape can make vertical structures very obtrusive with few opportunities for screening. However, this land is largely uninhabited with a moorland hinterland making it more suitable for some limited wind power development."*

3.2.2.1.4 Landscape Designations

Designated landscapes within 35km are illustrated on Figure 5.

There are two National Scenic Areas (NSA) defined within 35km, parts of both of which fall within the preliminary ZTV:

- Nith Estuary NSA, located a minimum of 15km south east of the project area; and,
- East Stewartry Coast NSA, located a minimum of 27km south of the project area.

There are eight Regional Scenic Areas (RSA) defined within 35km of the project area, parts of four of which fall within the preliminary ZTV: Thornhill Uplands, Torthorwald Ridge, Solway Coast, and Terregles.

Twelve Gardens and Designed Landscapes are identified within 35km, five of which are located within the preliminary ZTV. Three of these sites are located within 5km of the project area: Dalswinton (2.5km south east); Castlehill (5.2km south east); and, Cowhill Tower (4.8km south east). There are two further sites located within the 35km: Drumlanrig Castle (10km north west); and, Arbigland (28.4km south).

There are nineteen conservation areas within 35km, four of which are located within the preliminary ZTV: Thornhill (8.1km north west), East and West Cluden (7.1km south), Dumfries (11.2km south east), and The Crichton (13.3km south east).

3.2.2.1.5 Visual Context

The project area is located within an area of undulation, with the proposed location of the wind farm lying between 179 AOD and 240 AOD. The topography is locally uneven, with frequent drumlins and minor valleys. The topography continues like this to the west. The Nithsdale Valley is located to the immediate east, and runs in a northwest to southeast direction. Views are generally contained along this valley by the intervening ridgelines and hills. Pockets of visibility are also located on the hilltops surrounding the Nithsdale Valley, including Terregles Ridge to the west, the Lowther Hills to the north, and the hilltops along the coastline to the south.

Woodland cover is extensive throughout the 35km, with extensive areas of commercial forestry stretching across the uplands. This includes the Forest of Ae to the northeast, Dalmacallan to the west, and the hilltops along the coastline to the south. The Nithsdale Valley also contains an extensive pattern of both deciduous and coniferous shelterbelts, policy woodlands, and small coniferous plantations, which all offer localised screening along the Valley.

Settlements are generally located in the low-lying basins and valley areas, with many small villages and individual farmsteads scattered throughout the Nithsdale Valley basin

and the lower levels of its slopes. The town of Dumfries is located at the southern end of this Valley, and Thornhill to the north.

There is one nationally identified Long Distance Route located within 35km, the Southern Upland Way, which is located a minimum of 8km north of the project area. There are numerous locally important footpaths and cycle routes within 35km. For example, the Burns Heritage Trail runs extensively through the ZTV. At its closest point, it is located a 0.2km west of the project area.

There are two Sustrans Routes within 35km:

- National Route No 7, which runs from Sunderland to Inverness, and is located a minimum of 12.5km south of the project area; and,
- National Route 74, which connects Gretna and Glasgow via Lockerbie and Abington, and is located a minimum of 17.4km east of the project area.

There are four major transport routes within 35km: the A76, located within 1km to the west of the project area; the A75, located a minimum of 10.2km west; the A74(M), located a minimum of 17.3km east; the A710, located a minimum of 12.1km south; and, the A709, located a minimum of 12.1km south east.

3.2.2.1.6 Cumulative development

The following potential cumulative wind farms are located within 35 km of project area. The location of these sites is identified in Figure 6, and detailed in Tables 3.1 to 3.3 below:

Table 3.1 Wind farms within 0-10km of the project area:

Site Name	Status	Height	No. Of Turbines
Dalswinton	Operational	Unknown	15
Auchencairn Forest	In planning	Unknown	Unknown
Harestanes/Forest of Ae	Consented	Hub height 80m	71
Harestanes	Consented	Blade tip 125m	19

Table 3.2 Wind farms within 10km-20km of the project area:

Site Name	Status	Height	No. Of Turbines
Minnygap resubmission	In planning	Unknown	10
Barnbackle	In planning	Unknown	Unknown

Table 3.3 Wind farms within 20 – 30km of the project area

Site Name	Status	Height	No. Of Turbines
Doon Hill	In planning	Unknown	2
Blackcraig	In planning	To hub = 60m	23
Margree	In planning	Unknown	Unknown
Wether Hill	Operational	Unknown	Unknown
Cairn Hill	In planning	Unknown	Unknown
Ulzieside	In planning	To hub = 80m	12
Whiteside Hill	Consented	To hub = 80m	11
Clyde	Under construction	Unknown	Unknown
Carlesgill Hill	Consented	Unknown	Unknown
Newfield	In planning	To hub = 80m	21
Ewe Hill	In planning	To hub = 70m	16
Minsca Farm	Operational	Unknown	16

3.2.2.2 Potential Impacts

3.2.2.2.1 Types of impacts

The potential landscape and visual effects of the proposed development would arise as a result of impacts on factors including:

- The landscape fabric and features of the development site;
- Landscape character;
- Designated landscapes (NSA, SLAs, & HGDLs identified above);
- Sense of scale;
- Sense of distance;
- Existing focal points in the landscape;
- Skylining;
- Special landscape interests; and,
- Key visual receptors including statutory and non-statutory designated or protected areas, cultural heritage resources, residential properties and farmsteads, recreational/tourist resources, sequential routes, panoramic hilltop views, focused or directed views along glens, coastal and water based receptors, and cumulative views.

3.2.2.2.2 Key Issues

The review of baseline conditions based on desk and preliminary field study has identified the following as issues that will require consideration in the landscape, visual and cumulative assessment.

- The physical impacts of the proposed turbines, ancillary buildings, and access tracks to landscape features and fabric (including areas of commercial forestry in the vicinity of turbine positions and the access track);
- The landscape character of the study area – impacts within the immediate local landscape and the wider 35km study area (this will include consideration of the capacity of this part of the Fringe landscape to accommodate turbine development);
- The local community – visual effects within the immediate vicinity of the site, including properties at High Auldgirth, Auldgirth, and Blackwood. Variations in the degree of visibility of the turbines at these properties will be considered, in particular the southernmost turbines. Additional areas of visibility, where Blackwood Wind Farm would not be viewed alongside the existing Dalswinton Wind Farm, will also be considered;
- Settlements along the Nithsdale Valley corridor - visual effects at both individual properties and larger settlements, including Thornhill, Closeburn, and Dumfries;
- The wider landscape – longer distance views, including those at settlements outside the Nithsdale Valley, and those on hilltops. This includes Lockerbie to the east, the Terregles Ridge to the west, and the Lowther Hills to the north;
- Nith Estuary National Scenic Area - views from within this area, as well as more general effects on the character of the landscape within this area;
- Regional Scenic Areas – views from within these areas, with particular attention paid to Thornhill Uplands RSA which is located to the immediate north of the project area, as well as more general effects on the character of the landscape within these areas;
- Gardens and Designed Landscapes – many of these landscape are either not accessible to the public, or screened by perimeter estate woodland, however the assessment will examine potential visual effects on any vistas and views from these properties;
- Conservation areas – including the town centre of Thornhill, and the small villages at West and East Cluden;

- Major transport routes – many of the main routes running north through the study area are frequently used by tourists driving to access the western Scotland. The sequential views along the A76, the A75, the A701, the A74(M) and the A75 are all considered within the assessment;
- Footpaths and cycle routes – including Sustrans Routes No 7 and No 74, both of which traverse the study area, as well as locally important routes, including The Burns Heritage Trail;
- Cumulative assessment – the cumulative assessment includes views where a combination of one or more wind farm developments can be viewed simultaneously; and,
- The layout and design of the proposed wind farm – how the existing, adjacent Dalswinton Wind Farm will relate to the proposed Blackwood Wind Farm. SNH guidance document, Siting and Designing Wind Farms in the Landscape, (Version 1, December 2009) will be referenced in order to consider this issue.

3.2.2.3 Method of Assessment

3.2.2.3.1 Approach

Landscape and visual assessments are two separate, but interlinked, procedures. The baseline landscape, its analysis, and the assessment of character contribute to the baseline for the visual assessment. Assessments are undertaken in parallel and are informed by a combination of desk based and site based appraisal techniques, and professional judgements.

There are six key stages to the overall assessment process.

- Recording and analysis of the existing landscape fabric, landscape character and visual context associated with the study area through desk based and field based appraisal;
- Appreciation of the nature, forms and features of the proposed scheme;
- Assessment of the sensitivity of the existing landscape and visual receptors to change, and the magnitude of change likely to result from implementation of the proposed scheme;
- Evaluation of the significance of the changes identified;
- Identification of mitigation measures appropriate to the proposed scheme and the receiving landscape; and
- Assessment of the residual effects on landscape character and visual amenity.

In establishing the baseline conditions, the assessment takes account of the presence of operational wind energy developments, and those currently under construction.

The assessment process is iterative, in which the analysis of baseline conditions and the evaluation of potential effects resulting from the proposed scheme implementation can inform the evolution of the design, layout and configuration of turbines, and the development and incorporation of mitigation measures.

The Landscape and Visual Assessment (LVIA) and the Cumulative LVIA (CLVIA) are based on relevant and accepted guidance, and draws on information provided by statutory consultees, current landscape planning policies and other relevant documentation, computer based visibility analysis and fieldwork observations.

3.2.2.3.2 Guidance

The assessment will be undertaken in accordance with the methods outlined in the following best practice guidance:

- Guidelines for Landscape and Visual Impact Assessment (Second Edition), published by the Landscape Institute and the IEMA (2002) (GLVIA);
- Landscape Character Assessment: Guidance for England and Scotland, published by Scottish Natural Heritage and the Countryside Agency (2002);
- Techniques and Criteria for Judging Capacity and Sensitivity. Topic Paper 6, published by Scottish Natural Heritage and the Countryside Agency (2004);
- Guidelines on the Environmental Impacts of Wind Farms and Small Scale Hydroelectric Schemes, published by Scottish Natural Heritage (2001);
- SNH Guidance Cumulative Effect of Wind farms Version 2 revised 13-04-05;
- Visual Representation of Wind Farms: Good Practice Guidance, published by Horner and Maclennan and Envision (2006);
- Visual Assessment of Wind Farms: Best Practice, published by Scottish Natural Heritage and the University of Newcastle (2002);
- Herriot-Watt University, The Landscape Impact and Visual Design of Wind Farms; and,
- SNH Siting and Designing Wind Farms in the Landscape, Version 1, December 2009.

3.2.2.3.3 Study Area for the Landscape and Visual Assessment

The extent of the study area for the LVIA and CLVIA will be agreed with Dumfries and Galloway Council and SNH. However, in accordance with SNH guidance it is anticipated that the LVIA will consider an area of 35 km radius from the proposed turbine locations, in order to establish the spatial parameters of the assessment, and identify potential landscape and visual effects. Similarly, in accordance with SNH guidance CLVIA will identify all other wind farm proposals located within 60 km radius from the proposed turbines (see Figure 6). A more focused cumulative study may be agreed with the LPA and SNH.

3.2.2.3.4 Computer Based Visibility Analysis - Zone of Theoretical Visibility

In order to identify landscape and visual resources within the LVIA study area that may be theoretically affected by the proposed development, a series of Zone of Theoretical Visibility (ZTV) plans will be produced to illustrate the maximum theoretical area of visibility of the proposed wind farm and of agreed cumulative wind farms.

It should be noted that whilst ZTV's indicate theoretical visibility of the proposed development, the actual visual effects of the proposed development are assessed through a more detailed analysis of specific viewpoints via field survey observations and through the production and analysis of wireline and photomontage visualisations.

3.2.2.3.5 Computer Based Visibility Analysis - Visualisations

The assessment of potential visibility from selected viewpoints is typically aided by the use of visually representative material. To this end, a series of computer generated wireline images and photomontages will be produced for agreed viewpoint locations within the study area, to illustrate both the likely impacts of the proposed development in its own right, and cumulatively.

It is anticipated that viewpoints within a 15km radius of the project area may be visualised by way of photomontage and wireline images; and that viewpoints beyond 15km will be visualised by wireline image only.

Based on a review of the preliminary ZTV (Figure 3) and an initial field survey, a preliminary list of key viewpoints has been identified for discussion with the LPA and SNH as follows:

Table 3.4 Preliminary viewpoint list

VP Ref	Location	Co-ordinates	Rationale

VP Ref	Location	Co-ordinates	Rationale
1	High Auldgirth	92283 87777	Closest settlement to the development, and also located within the project area.
2	Old Brig Lane, Auldgirth	91557 86365	One of the closest settlements to the project area, and located in the northwest of the Nithsdale Valley. Also within the Thornhill Uplands RSA.
3	Shawsholm Road, Closeburn*	89659 92258	One of the closest settlements to the project area, and located in the northwest of the Nithsdale Valley. Also within the Thornhill Uplands RSA. Views south along the A76. transport corridor.
4	Picnic spot, Drumlanrig Castle HGDL*	85403 99064	Garden and Designed Landscape open to the public.
5	Thornhill Conservation Area	88026 95253	Settlement located in the north of the Nithsdale Valley, and also a Conservation Area.
6	Auldgirth Bridge, Blackwood	91150 86336	Footpath river crossing in close proximity to the project area.
7	Ellisland Farm*	92922 83849	View north along the A76 transport corridor, and tourist destination that is part of The Burns Heritage Trail.
8	Dalswinton HGDL*	94378 84216	Garden and Designed Landscape open to the public.
9	Maxwelltown Railway Path, Dumfries	97106 77342	Frequently used cycle route within the principal town of Dumfries and Galloway.
10	Farmhouse Tower, Caerlaverock Wetland Centre	05137 65626	Tourist destination and within the Nith Estaury NSA.
11	Lambhill Terrace, Lockerbie*	12528 82852	Large town and elevated residential area to the east.
12	Throughgate House, Throughgate	87373 84257	Views west from an elevated settlement located outside the Nithsdale Valley.

* = Viewpoints consistent with or located nearby to those within the Dalswinton ES

3.2.2.3.6 Landscape Assessment

Landscape assessment is based on an evaluation of the existing (baseline) conditions, the identification existing landscape fabric and resources, and the assessment of their sensitivity and the magnitude of change associated with the introduction of the proposed scheme. The existing (baseline) landscape will be appraised from the national level, through to the regional level, to a more local scale commensurate to the study area, with reference made to published SNH landscape character assessments and other data sources where appropriate. The description and classification of existing landscape character, analysis of intrinsic quality, and appreciation of value inform the assessment process. Having established the baseline, the sensitivity of the landscape will then be assessed. The sensitivity of the landscape in terms of its character is a function of landscape quality and value, landscape character sensitivity and visual sensitivity. Following this the predicted impacts will be evaluated and mitigation measures proposed in order to remove, or reduce the identified impacts.

3.2.2.3.7 Visual Assessment

Visual assessment involves an evaluation of the baseline visual context, the identification of visual receptors, and the assessment of their sensitivity and the magnitude of change associated with the introduction of the proposed scheme. The assessment commences with identification of the theoretical visibility associated with the proposed scheme, leading to identification of representative visual receptors, description of the existing visual context, and evaluation of the visual implications of implementation of the proposed scheme within the study area. Viewpoints will be identified and selected which represent a range of receptor types found within the study area, and will be representative of receptors located at differing distances, direction and elevations, and will be representative of both direct and oblique views and from locations where either full or partial views of the development may be afforded. Visual sensitivity considers the location and existing visual context of the receptor or viewpoint, the expectations and occupation or activity of the receptor, and the importance of the view.

The assessment of visual impact from any one location, takes into account the following:

- Sensitivity of the views and viewers (visual receptor) affected;
- Nature, scale or magnitude and duration of the change;
- Extent of the proposed development that will be visible;
- Degree of visual intrusion or obstruction that will occur;

- Distance of the view; and,
- Change in character or quality of the view compared to the existing.

3.2.2.3.8 Cumulative Landscape and Visual Effects

Cumulative landscape effects occur when a combination of one or more wind farm developments begin to influence the perception of landscape character. Cumulative visual effects occur in several ways, either arising when wind farm developments are visible either in combination or succession from a particular viewpoint, or appearing sequentially as multiple developments when moving through the landscape. Cumulative effects can also develop through a gradual change in perception over time.

Assessment of the comparative effects of different wind farm combinations (i.e. those at different stages of the development process) is considered to provide for a better understanding of the likely cumulative effects of the proposed development on the receiving landscape and visual context. Operational wind farm developments are considered in the LVIA baseline. The CLVIA therefore considers the following scenarios.

- Scenario 1 involves the assessment of the impacts arising due to the addition of the proposed development to an existing baseline comprising operational wind farm developments in conjunction with those granted planning consent i.e. under construction, or approved schemes, and assuming they are all constructed and operational;
- Scenario 2 involves the assessment of the impacts arising due to the addition of the proposed development to a cumulative baseline comprising all schemes identified in Stage 1, in addition to submitted (but as yet undetermined) wind farm planning applications, and assuming they are all constructed and operational.

In consultation with Dumfries and Galloway Council and SNH, other wind farm developments to be considered within the CLVIA will be agreed.

For each wind farm agreed for inclusion within the detailed cumulative assessment, cumulative ZTVs will be generated in order to determine the extent of the potential cumulative effects with Blackwood Wind Farm, and to identify/confirm cumulative viewpoints.

3.2.2.3.9 Sequential and Cumulative Sequential Visibility

Sequential visibility occurs when an observer moving through the landscape along a linear route (e.g. a road) experiences a series of repeated views containing the proposed development and /or other wind farms within the area.

The assessment of sequential visibility will describe the baseline conditions and describe the visual effects of the proposed development. Factors considered in the assessment of sequential effects include: the length of the route; the distance from the proposed development; direction of view; and the relationship to the ZTV coverage in terms of number of turbines visible; the extent of the proposed development visible; and the frequency and duration of available views encompassing the proposed development or cumulative developments along identified routes.

3.2.2.3.10 Magnitude of Change

The scale or magnitude of identified landscape, visual effects will be evaluated using defined criteria and will be rated on a six point scale from Very Large, Large, Medium, Small, Very Small, to Negligible

3.2.2.3.11 Nature of Effects

The assessment will consider the nature of landscape and visual effects i.e. whether the change is direct or indirect, the duration of the effect i.e. short, medium, long term/permanent or temporary change, and whether the change is reversible or not.

3.2.2.3.12 Significance of Effects

The significance of all the landscape or visual effects (including cumulative and sequential) is determined by assessing the sensitivity against the magnitude of change. The assessment of significance of residual effects takes into consideration mitigation measures implemented as part of the development.

3.2.3 Cultural Heritage and Archaeology

3.2.3.1 Initial Consultation(s)

The proposed scope and methodology detailed below was devised following an initial consultation with Dumfries and Galloway Council's archaeology service in January 2011.

3.2.3.2 Preliminary Environmental Baseline

An initial review of readily available archaeological data indicates that human activity in the vicinity of the Blackwood Wind Farm is in evidence since prehistoric times, in the

form of prehistoric forts, cairns, findspots and funerary monuments. Roman military activity in Nithsdale is proven through the identification of the Roman fort and camps at Bankhead, Dalswinton, 2km to the south of the development area, with a connecting system of roads. Medieval and post-medieval archaeological sites are also recorded.

No protected sites (e.g. Scheduled Ancient Monuments, Historic Gardens/Designed Landscapes or Listed Buildings) have been identified within the development footprint. The closest protected site is the scheduled hillfort at Mullach, approximately 300m to the south of the proposed development boundary, within the zone of theoretical visibility (ZTV) of the development, shown in Figure 3. Additional protected sites are located within the ZTV, primarily within Nithsdale. The location of key protected archaeological sites is shown in Figure 2.

No unprotected archaeological sites have been identified within the development boundary.

3.2.3.3 Potential Impacts

The potential impacts are summarised below:

- Construction impacts (direct or indirect) on features of archaeological interest;
- Construction impacts upon previously unrecorded archaeological sites or features; and
- Operational impacts (primarily indirect) on the settings of protected heritage sites (principally SAMs, Historic Gardens/Designed Landscapes (HGDLs), Conservation Areas and Listed Buildings).

3.2.3.4 Method of Assessment

To consider direct impacts, data will be gathered for a Study Area of the footprint of the proposed Blackwood windfarm, including access roads and an approximate 1km buffer from the site boundary line. Data will be gathered from the following sources:

- The Dumfries and Galloway Council Sites and Monuments Record (SMR); consulted for lists of known archaeological sites and monuments, previous archaeological interventions, and promoted monuments (monuments identified by the Council as having a tourism or recreation value);
- Historic Scotland's databases of Listed Buildings, Scheduled Ancient Monuments, Historic Gardens and Designed Landscapes and monuments proposed for scheduling;

- The National Monuments Record of Scotland (NMRS) and Historic Landscape Characterisation Areas;
- Vertical stereo aerial photographic coverage held by RCAHMS;
- Ordnance Survey map coverage from 1850 onwards, and any other readily available early cartographic sources held at the National Library of Scotland Map Library;
- Bibliographic references and early parish accounts; and
- The Dumfries and Galloway Council Archives.

To consider indirect impacts, data will be gathered for up to a 10km radius from the boundary of the proposed Wind Farm (depending on the Zone of Theoretical Visibility, as determined by the Landscape and Visual Assessment) to allow for an assessment of impact on the setting of statutorily-protected sites.

Data will be gathered from the following sources:

- Historic Scotland's databases of Listed Buildings, Scheduled Ancient Monuments, Historic Gardens and Designed Landscapes and monuments proposed for scheduling. Historic Scotland's ongoing development of an Inventory of Historic Battlefields will also be monitored.
- Dumfries and Galloway Council SMR's list of Nationally Important, unscheduled sites, and list of promoted monuments.

An archaeological walkover survey will be undertaken for the area of the proposed wind farm array, access tracks and grid connection route to consider the condition of the identified archaeological sites, to determine the potential for any previously unrecorded archaeological sites (including the potential identification of archaeological sites) and to comment on past and present land use and field boundaries.

In conjunction with the Landscape and Visual Assessment, cultural heritage receptors within the ZTV will be identified and visited to assess any potential indirect impacts.

Cumulative assessment of the impact on cultural heritage receptors will be undertaken, taking into consideration Dalswinton windfarm in particular.

3.2.4 Ecology & Ornithology

3.2.4.1 Initial Consultation(s)

No initial consultation has taken place at time of writing other than a request for data from the local records centre (Dumfries & Galloway Environmental Resources Centre).

For the purposes of the Ecological Impact Assessment, the ecological assessment will include review of any relevant existing ecological information for the development area and immediate surrounds; information is readily obtainable, and in some cases has already been obtained.

Scottish Natural Heritage (SNH) has produced guidance on the siting of new wind farm developments in the form of Policy Statement 02/02.[1] Due to the scale of the plans provided within the policy it is not possible to accurately describe the spatial relationship between the site and sensitivity bands. However, it can be seen that the project area lies on the boundary between Zones 1 (lowest) and 2 (medium) of the Natural Heritage Sensitivity Maps developed by SNH.

3.2.4.2 Preliminary Environmental Baseline

Designated sites

Good EIA practice includes identification of any statutorily and non-statutorily designated sites of nature conservation interest within a minimum of 2km of the boundaries of a proposed development, though this may be extended if impacts could potentially extend over a wider area (IEA 1995[2]).

There are no statutory designated sites within 2km of the site. The nearest statutorily protected site lies c.6km to the east of the site at Black Loch (Site of Special Scientific Interest). Black Loch is designated due to its basin fen properties, being the best example of a basin fen in the Nithsdale District. The site also lies outwith sensitive peat areas. There are no non-statutory sites within the project site with the closest some 3 km southwest between Broadford and Dunscore. Further information on non-statutory sites has been requested from the Dumfries & Galloway Environmental Resources Centre.

Protected Species Records

The National Biodiversity Network (NBN) gateway has been interrogated to identify which species had been recorded within the area around the proposed Blackwood Wind Farm. This search does not provide definite proof of presence or absence but does provide some background to the possible occurrence of species. The search indicated records of the presence of badger (*Meles meles*), otter (*Lutra lutra*), red squirrel (*Sciurus vulgaris*) and bat species (*Daubenton's* and *Pipistrellus species*) in the wider area.

[1] Policy Statement 02/02 Strategic Locational Guidance for Onshore Wind Farms in Respect of the Natural Heritage (Updated May 2005)

[2] Institute of Environmental Assessment (1995). Guidelines for Baseline Ecological Assessment. E & FN Spon. London.

Badger sightings within the wider area around the site have been recorded from the 1970s (High Auldgirth). Otters have been recorded throughout the 70s, 80s and 90s in Laggan Burn, Duncow Burn, Claughrie Burn and the River Nith. Bat species have been recorded from the 1800s through to 2007 at Holywood Station, Burnhead, Dalswinton and Auldgirth.

Red squirrels have been recorded within the site boundary itself as well as within the wider area with records dating from the 80s right through until 2007. Records were taken within the dense stands of coniferous woodland in and around the site.

The NBN Gateway includes no records of Great Crested Newt (*Triturus cristatus*) within the general area of the proposed development. There is one record of Slowworm *(Anguis fragilis)* recorded in 1992 within the wider area and one record of adder *(Vipera birus)* recorded pre-1990.

Field Surveys 2010/11

Bird surveys have been carried out at the site but wider ecology surveys have yet to be carried out.

A programme of breeding bird surveys between April and August comprising Vantage Point (VP) surveys, woodland point counts and a territory mapping survey has been carried out in line with SNH guidance[3]. The breeding bird community comprises a typical suite of farmland/woodland species such as willow warbler, chaffinch, whitethroat and blackcap. Notable species included tree pipit, spotted flycatcher and reed bunting. A pair of curlew also held territory. No target species were recorded during the VP surveys.

Surveys have also been carried out during the autumn and winter (September 2010 to March 2011) comprising VP surveys and a monthly walkover survey of the site and surrounding area (out to 1km where access was possible), again, in line with SNH guidance. Target species activity has also been limited during these months with two flights of pink footed goose (99 and 190 birds), two flights of greylag (four birds and seven birds) and a single goshawk flight. Single flights of goshawk and peregrine were also noted during walkover surveys. No notable aggregations of wildfowl or waders have been recorded during walkover surveys. A barn owl roost site has been identified in an out-building at High Auldgirth (there is no suitable nest platform within this building however). Note that at the time of writing, data from March is still to be collated.

[3] Survey methods for assessing the impacts of onshore wind farms, 2005 (revised 2010), SNH.

Goshawk are known to breed in woodland to the north of the site and information on this will be requested from the local raptor study group (access has not been possible for surveys).

3.2.4.3 Potential Impacts

The key issues relating to nature conservation interests and wind farms are as follows:

- The effects of direct habitat loss/damage due to land take by wind turbine bases, tracks and ancillary structures;
- The effects of indirect habitat loss/damage, e.g. the displacement of birds or protected species from the proximity of the wind turbines. Such disturbance may occur as a consequence of construction work, or due to the presence of the wind farm close to breeding, sheltering/roosting or feeding sites or on habitual flight routes;
- The effects of collision with rotating turbine blades, overhead wires, guy lines and fencing (i.e. killing or injury of birds or bats), which is generally considered to be of particular relevance (in respect of birds) for sites located in areas known to support raptors or large concentrations of waterfowl.

3.2.4.4 Method of Assessment

In assessing the effects of any development on ecology and nature conservation interests it is necessary to define the areas of land cover and the species and habitats that need to be considered in the EIA. In doing this, two inter-related factors need to be considered:

- A development can affect habitats and species directly (e.g. the land-take required) and indirectly (e.g. disturbance), with the impacts potentially extending beyond the development site boundaries;
- It is a fundamental requirement of EIA practice to focus on the significant effects of a given development. It is also impractical for an ecological assessment to consider every individual species and habitat that may potentially be affected, rather it should focus on 'valued ecological receptors', i.e. species and habitats that are valued in some way (e.g. designated sites, species protected by specific legislation or species which have economic value) and which could potentially be affected by the proposed development.

It is against this background that the scope of this assessment will be defined through further desk study and an extended Phase 1 habitat survey following standard methodology (JNCC, 1993). This extended Phase 1 survey will determine the need for

any additional survey work (such as otter, badger, water vole surveys) that may be required. In the context of the concern regarding bats and wind farms, a scheme of bat surveys will also be carried out (currently anticipated to be 4 visits between May and September 2011).

The assessment will take account of the requirements of, and/or advice given in the following:

- Directive 2009/147/EC on the conservation of wild birds (the Birds Directive);
- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive);
- The Conservation (Natural Habitats, &c) Regulations 1994 (as amended);
- Wildlife and Countryside Act 1981 (as amended);
- The Nature Conservation Scotland Act (2004);
- The Surface Waters (Fishlife) (Classification) (Scotland) Regulations 1997 (as amended);
- The Protection of Badgers Act 1992;
- Scottish Planning Policy (SPP): Subject Policy, Landscape and Natural Heritage;
- Planning Advice Note (PAN) 60: Planning for Natural Heritage;
- PAN Onshore Wind Turbines (web based). Paragraphs on pages 5 and 6 of this PAN refer to impacts on Wildlife and Habitat, Ecosystems and Biodiversity.
- Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended (June 2000);
- Scottish Executive Guidance on Protected Species (SE, 20014);
- Institute of Ecology and Environmental Management (IEEM 2006) Guidelines for Ecological Impact Assessment in the United Kingdom
- Survey methods for use in assessment of the impact of proposed onshore windfarms on bird communities (SNH 2005 – Revised 2010);
- Assessing significance of impacts from onshore windfarms on birds outwith designated areas (SNH 2006);

[4] European Protected Species, Development Sites and the Planning System: Interim guidance for local authorities on licensing arrangements. Scottish Executive 2001.

- Developing field and analytical methods to assess avian collision risk at wind farms (Band et al 2007);
- Natural England Technical Information Note TIN051 - Bats and onshore wind turbines. Interim guidance. First edition 11 February 2009;
- The UK Biodiversity Action Plan (UKBAP);
- The Scottish Biodiversity List; and
- Dumfries & Galloway Local Biodiversity Action Plan (LBAP).

Taking account of the impacts predicted with respect to the hydrological environment (see below), the potential effects upon fish will also be assessed. It is not proposed, however, that field surveys will be undertaken to support that assessment.

3.2.5 Hydrology and Hydrogeology

3.2.5.1 Preliminary Environmental Baseline

The main watercourses within or adjacent to the project area are detailed in Table 3.5 below.

Table 3.5 Main Watercourses

Main Watercourses on Site
Rivers and Burns
River Nith
Ballochan Linn
Brandy Burn
Clauchrie Burn
Pennyland Burn

The majority of the project area in the immediate surrounds of the proposed locations for the turbines drains into tributaries of the Pennyland Burn. There are also a number of small, unnamed tributaries in the eastern section of the site that drain into Clauchrie Burn and Ballochan Linn. All three of these watercourses are tributaries of the River Nith. Further tributaries in the south of the project area drain into Brandy Burn. There is one further unnamed tributary in the extreme south of the project area that drains directly into the River Nith.

Although the River Nith is not directly protected, it is a substantial watercourse. With fisheries interests and the overarching requirements of the Water Framework Directive, due regard will need to be paid to the potential effects of the development, particularly hydro-chemical changes that can occur due to deforestation.

There is a small water body in the north of the site, within woodland. A second water body with associated unnamed watercourses draining into it lies in the south of the site, close to Low Auldgirth.

It is possible that there may be private water supplies and surface and groundwater abstractions within or close to the project area and if so these will also be considered during the assessment. However, this site is unlikely to be substantially sensitive in terms of its physical environment attributes.

3.2.5.2 Potential Impacts

The potential impacts are summarised below:

- Hydrological change, including possible disturbance and modification of watercourses, existing drainage patterns, and groundwater recharge and flows;
- Sediment or chemical pollution of watercourses;
- Interruption or disturbance of public or private water supplies; and
- Effects on freshwater ecology due to pollution, obstruction of watercourses or changes in hydrological regime.

Demonstrating that the Wind Farm will have a minimal impact on designated areas, on the public water supply and any private water supplies will be a key aim for the EIA.

3.2.5.3 Method of Assessment

A comprehensive desktop information gathering exercise will be carried out followed by site surveys, in order to verify the following information:

- Surface hydrology including definition of catchments and low and high flows;
- Site drainage patterns;
- Location of springs and flushes;
- Details of local aquifers and groundwater;
- Location and nature of water abstractions including public and private water supplies;
- Existing water quality monitoring on site and downstream of the development;
- Freshwater fisheries on site and downstream of the development;
- Site geological conditions;

- Soil associations and distribution on site, including identification of any areas of peat; and
- Identification of areas vulnerable to erosion or sediment deposition.

The information will establish the environmental baseline and will be used to inform the development of the layout. Following establishment of baseline conditions, an assessment of the potential effects associated with construction, operation and decommissioning of the proposal will be carried out. This will follow the established source-pathway-receptor approach.

The following legislation and national policy and guidance will be taken into consideration and will inform the basis of assessment:

- *The Water Framework Directive* (2000/60/EC);
- *The Water Environment and Water Services (Scotland) Act 2003*;
- *The Water Environment (Controlled Activities) (Scotland) Regulations 2005*;
- *SPP7 Planning and Flooding*; and
- *PAN 61 Planning and Sustainable Urban Drainage Systems*.

Relevant SEPA Pollution Prevention Guidelines and polices will also be considered during the assessment.

3.2.6 Noise

3.2.6.1 Preliminary Environmental Baseline

The nearest village to the proposed development is Auldgirth (NX 913 865) located in the extreme south of the project area, approximately 1.5 km to the south west of the nearest proposed turbine location. The closest large town is Dumfries, situated approximately 15km to the south and therefore not considered close enough to be affected by the development.

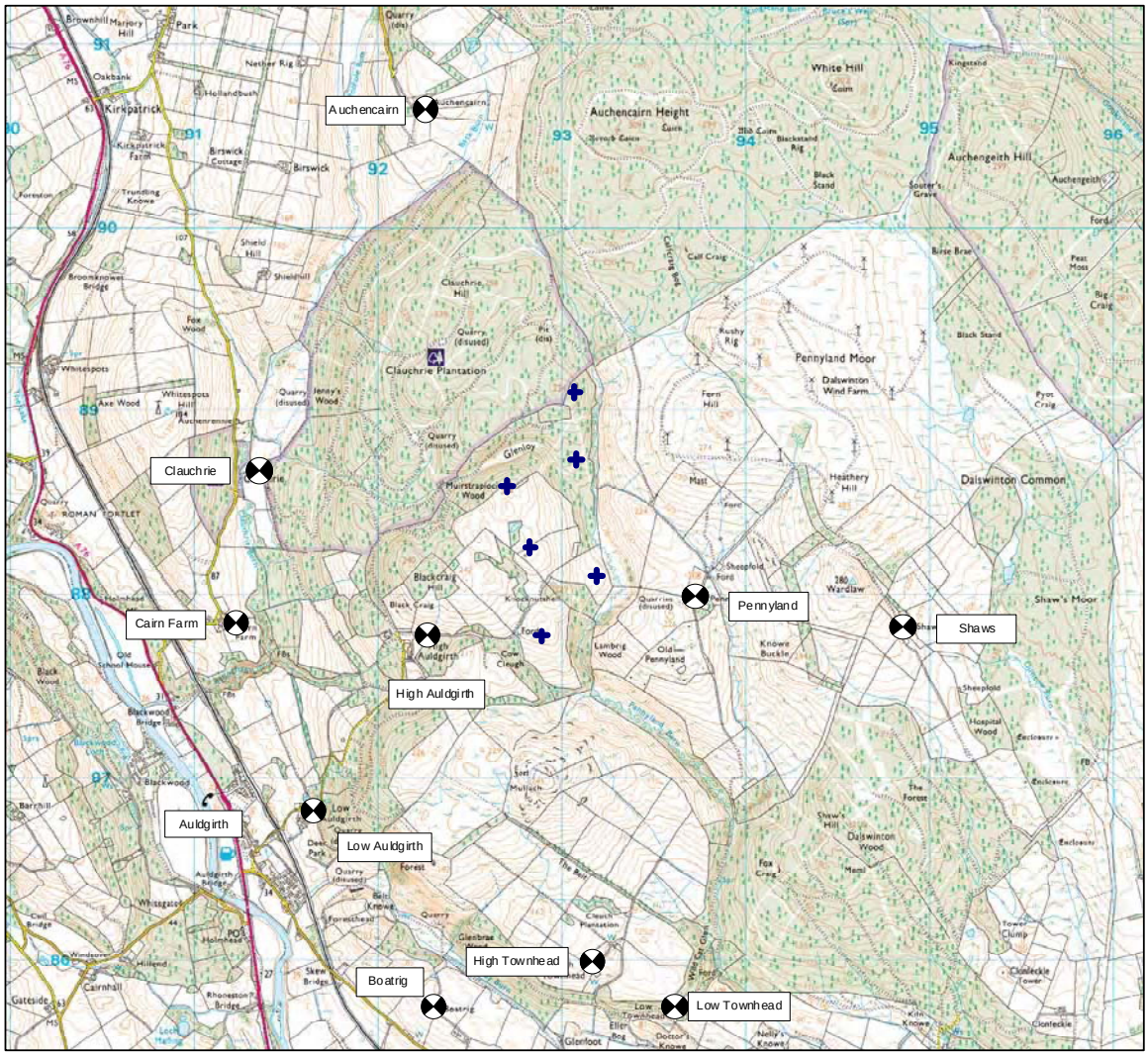
In addition to Auldgirth, the nearest potential noise sensitive to the proposed turbine locations include the following:

- Old Pennyland (NX 936 836) approximately 0.5km east
- High Auldgirth (NX 922 877) approximately 0.6km west
- Clauchrie (NX 913 886) approximately 1.4km west
- Low Auldgirth (NX 916 868) approximately 1.5km southwest
- Shaw's (NX 949 877) approximately 1.7km east

- Cairn Farm (NX 912 878) approximately 1.7km west
- Auchencairn (NX 922 906) approximately 1.8km north
- High Townhead (NX 931 859) approximately 1.8km south
- Boatrig (NX 923 857) approximately 2km south
- Low Townhead (NX 936 857) lies just over 2km south
- Pennyland (NX 937 880) approximately 0.5km east of the nearest proposed turbine location. However, this settlement is known to be unoccupied and therefore does not need consideration during the assessment.

The location of these potential noise sensitive receptors, relative to the initial wind farm design is presented in Figure 7.

Figure 7 Potential Noise Sensitive Receptor Locations



3.2.6.2 *Potential Impacts*

The potential impacts on sensitive receptors are summarised below:

- Construction traffic noise (primarily along the local road network) and construction plant noise from site; and
- Operational noise from turbines and substations.

3.2.6.3 *Method of Assessment*

Noise impacts resulting from construction operations on site will be predicted in accordance with ISO91613-2:1996 "*Acoustics – Attenuation of sound during propagation outdoors"*. The significance of noise impacts will be established with reference to criteria within BS 5228-1:2009 "Code of practice for noise *and vibration control on construction and open Sites- Part 1: Noise*".

If required, a substation noise impact assessment will be undertaken in accordance with BS4142 1997 'Method for rating industrial noise affecting mixed residential and industrial areas'. However, at this stage it is assumed likely that the substations will be situated at distances from the noise sensitive receptors that the effect of noise would not be considered significant (considered to be substation noise levels higher the background noise level at noise sensitive receptors).

Noise impacts resulting from the operation of the wind turbines will be undertaken in line with ETSU-R-97 '*The Assessment and Rating of Noise from Wind Farms'*. Consultations will also be held with the Environmental Health Department of the Dumfries and Galloway Council. An assessment would include the following:

- A site visit to verify the list of potentially sensitive receptors identified above and identify any further receptors that may be in evidence;
- If required, a noise monitoring survey at relevant receptors where the assessment indicates monitoring is required;
- Prediction of the noise levels that will be experienced at each receptor; and
- Assessment of the significance of impact in accordance with the guidance given in ETSU–R-97.

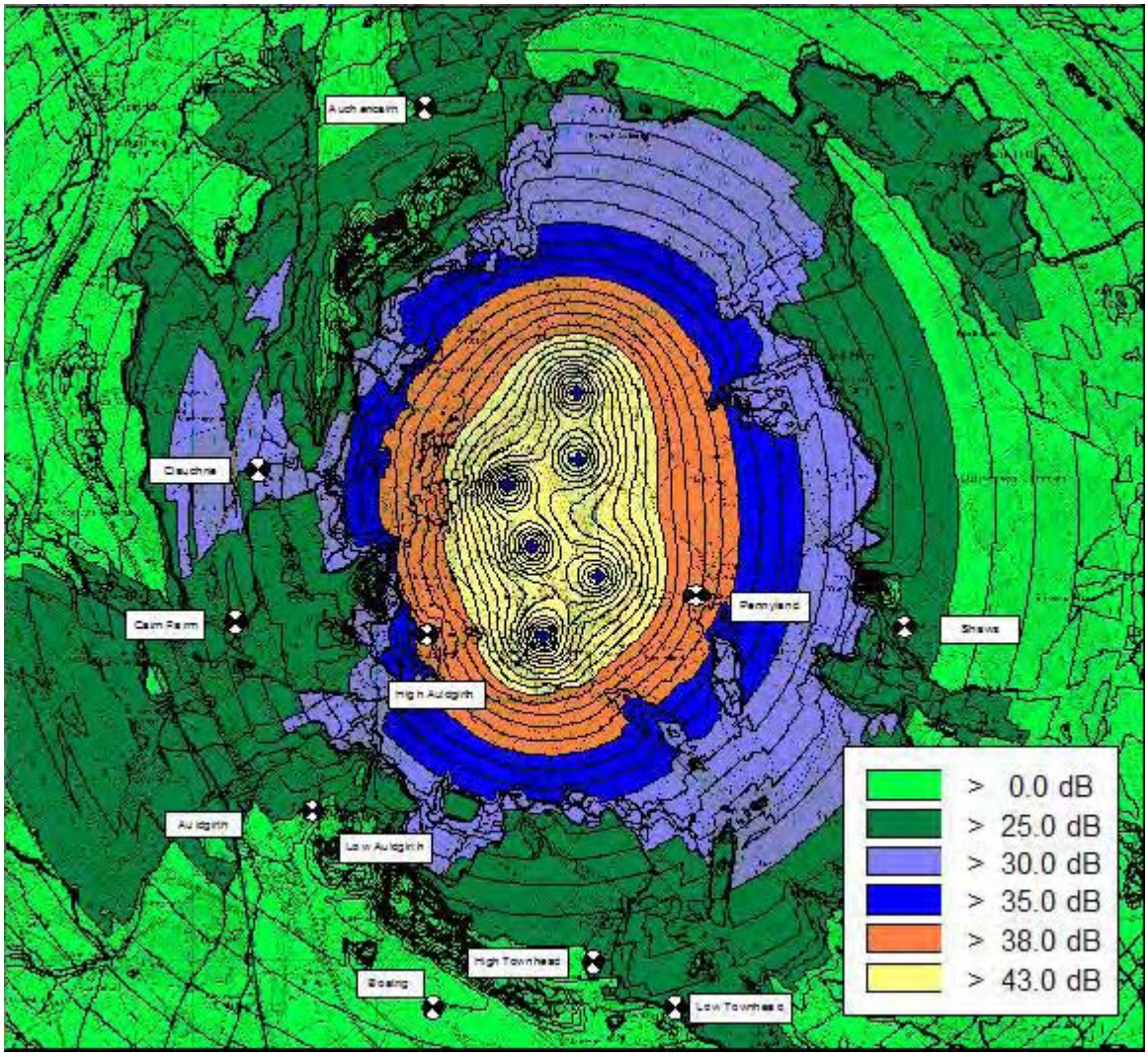
For the purposes of this development, an initial desk study has been undertaken using REPower MM82 Evolution wind turbine data to predict resulting noise levels in the surrounding area and thereby identify properties which may be susceptible to significant noise impact and which will therefore form the focus of the assessment. The highest sound power level data at any specific wind speed for the wind turbine type has been

used within the model. The predictions have been generated using CadnaA noise modelling software with parameters set in accordance with the method outlined in the 'Agreement about relevant factors for noise assessment from wind energy projects' (Acoustics Bulletin Volume 34, No 2 March / April 2009). The resulting noise levels are presented in Figure 8. The noise contour colours represent, or relate, to different ETSU-R-97 minimum criteria:

- Yellow > 43 dB(A): above the night-time ETSU-R-97 minimum criteria;
- Orange >38 dB(A): above the night-time ETSU-R-97 minimum criteria assuming a 5 dB tonal penalty;
- Dark blue >35 dB(A): above the daytime ETSU-R-97 minimum criteria;
- Light blue >30 dB(A): above the daytime ETSU-R-97 minimum criteria assuming a 5 dB tonal penalty;
- Green <30 dB(A): within ETSU-R-97 daytime minimum criteria (even with tonal penalty).

The tonal audibility of the current measured test data used for the MM82 evolution turbine indicates that a tonal penalty ***would not*** be required.

Figure 8 Predicted Wind Turbine Noise Levels



The results show that, of those potential noise receptors listed above, only one existing noise sensitive receptor, High Auldgirth, would experience noise levels from the proposed development in excess of the ETSU-R-97 minimum criteria (using the daytime 35 dB(A) minimum without tonal penalty) based on the 6 turbines proposed in the initial site layout. With the current arrangement of wind turbines, it is recommended that a noise survey be undertaken in accordance with ETSU-R-97 at High Auldgirth (It should be noted that Pennyland is an unoccupied farm building).

Given the proximity of the Dalswinton Wind Farm, it is appropriate for the noise assessment to take into consideration the cumulative effect of these neighbouring wind turbines. The 15 REPower MM82 wind turbines have therefore been included within this initial desk study. Taking account of the potential cumulative noise from both sites, it has been concluded that the noise contribution from the proposed wind turbines would not be significant (i.e. at least 10 dB below the noise from Dalswinton) at receptor

locations predicted to experience noise levels from the Dalswinton site above the ETSU-R-97 minimum. Therefore, the effect of adding the proposed 6 turbines to the existing Dalswinton wind farm does not introduce a need to consider additional properties as part of the noise assessment

Based on the current arrangement of wind turbines for the Blackwood wind farm proposal, only the properties at High Auldgirth will require assessment under ETSU-R-97.

3.2.7 Traffic and Transport

3.2.7.1 Preliminary Environmental Baseline

The construction and operation of a wind farm development will require the transport of large components and plant items that are used to build the infrastructure and to erect the turbines. Quantities of building materials including aggregate and concrete also need to be transported unless sources are batched on site. It is envisaged that such requirements will be serviced via the A76, A75 and M74 from further afield.

3.2.7.2 Potential Impacts

It is not expected that there will be any significant impacts resulting from operational traffic; the potential impacts are anticipated to be construction traffic impacts upon existing traffic flows along the A76.

Further issues that will require consideration are:

- Disruption to existing traffic flows on the local road network during construction,
- Accessibility from the port to the development site.

3.2.7.3 Method of Assessment

Impacts are likely to be limited to the construction phase of the development specifically the delivery of plant machinery and materials. These will be assessed in two ways, as discussed below.

Vehicle Accessibility

The main concern with respect to vehicle accessibility is the delivery of plant, materials and machinery during construction, although account would be taken of the need to replace major components during operation.

To this end, a detailed study may be carried out in terms of assessing the most appropriate mode of transport for moving components, machinery and materials to the site and the capacity of the road network to accommodate such transport. In particular,

the study will focus on the requirements for abnormal loads. The most onerous elements to transport are the turbine components. These often form abnormally long or heavy loads. The routes chosen for turbine components will be assessed through swept path analyses via computer modelling informed by site survey. Any enabling works that are required will be agreed with the local authorities and the impact and level of the works assessed. Where any enabling works are required these will be identified and assessed.

The local routes from the highway network to the turbine positions will be closely examined to minimise the impact on sensitive features. Off the main highway network, existing tracks and roads will be used where possible with modifications recommended where required to accommodate the swept path of the blade transporters.

Traffic Disruption

It is the nature of wind farms that, during their operational lifespan, they create so few vehicular movements as to have little perceivable impact. The operational phase of the wind farm will not therefore be considered in terms of traffic disruption as part of the EIA.

In comparison, the volume of construction traffic will be higher than that associated with operational requirements and therefore the assessment of impacts will focus on the construction element of the proposed development. The assessment will discuss the types of machinery, materials and components requiring transportation including:

- Turbine components
- Turbine electrical equipment;
- Turbine foundations and crane hard-standings;
- Access tracks, compounds and substation compound aggregates;
- Removal of spoil generated during access track construction;
- Other traffic such as excavators, site huts, fencing; and
- Construction worker vehicles.

The assessment will also identify the types of vehicle needed to transport such loads and potential transportation routes.

The volume of all construction traffic movements will then be quantified along with the projected schedule of movements. This will then be used to determine daily vehicle numbers and the delivery profile.

These volumes will then be assigned to the local highway network in accordance with best estimates for distribution based upon advice from turbine manufacturers, contractors and haulage firms familiar with turbine installation and transport.

Vehicle volumes and times will then be assessed against existing baseline traffic levels, the data for which will be obtained from the Dumfries and Galloway Roads and Transportation Department and/or Transport Scotland. This will be used to determine the impact of the traffic associated with wind farm construction in terms of increases in traffic flows on the local road network.

3.2.8 Socio-economic, Land Use and Tourism

3.2.8.1 Preliminary Environmental Baseline

The site falls within Council Ward 8: Mid and Upper Nithsdale. Settlements in the vicinity of the site include the village of Auldgirth in the south of the project area, and Dalswinton, 2km to the south of the project area boundary site. The nearest large conurbation is Dumfries (population 43,009), located 15km to the south.[5]

The Mid and Upper Nithsdale ward employs people primarily in health and social work (14.4%), manufacturing (14%), agriculture, hunting and forestry (13%) and wholesale and resale trade and repairs (13.1 %).[6]

There are no formal recreational routes on site, although there are a number of forest tracks and cycle routes within its vicinity, primarily associated with the Forest of Ae. The main activity on site relates to game sports and clay pigeon shooting.

3.2.8.2 Potential Impacts

The potential impacts are summarised below:

- Disruption due to construction, e.g. noise nuisance, traffic disruption and visual impacts;
- Operational impacts upon tourism and recreation; and
- Direct and indirect economic benefits resulting from employment and other contributions.

3.2.8.3 Method of Assessment

An assessment will be carried out taking account of the following:

[5] Information from Scottish census data: http://www.scrol.gov.uk

[6] Dumfries and Galloway Council, 2011. Accessed at : http://www.dumgal.gov.uk/CHttpHandler.ashx?id=400&p=0

- Socio-economic effects of the proposals, primarily related to job creation;
- Proximity of the project area to areas of recreational use, public rights of way, and footpaths; and
- Proximity of the project area to areas of interest for tourism.

The impacts will be predicted with reference to published research where relevant, via consultations with relevant authorities and bodies, and through reference to other technical assessments relevant to the proposed development, e.g. landscape and visual assessment and archaeological assessment.

3.2.9 Electromagnetic Interference (EMI), Aviation and Shadow Flicker

3.2.9.1 Preliminary Environmental Baseline

Consultations on the indicative 6 turbine layout have been undertaken with a range of telecommunications operators and aviation consultees. Response to the consultation process have yet to be received from the Civil Aviation Authority (CAA), Ministry of Defence (MoD) and Nats En Route Ltd (NERL). In respect of telecommunications consultees:

- Airwave Solutions – raised no objections;
- Orange – has stated that the indicative layout is clear of all links of interest;
- T-Mobile – no response to date;
- BT – has stated that the indicative layout is clear of all links of interest;
- Vodafone – raised no objections;
- Atkins on behalf of unnamed client – raised no objection;
- JRC on behalf of SP – has raised an objection on basis that area consulted on is 1km from link. The exclusion area does not infringe on layout, so it is likely that the objection will be removed when a final layout is determined; and
- BBC (online tool) – notes that the television reception of 6 homes may be affected for which no terrestrial alternative is available (and therefore a satellite TV solution can be provided), Another 210 homes may be affected for which an alternative is available (i.e. aerial may need to be altered).

The impact on the existing Dalswinton windfarm will also be considered and reported on in the Electromagnetic Interference (EMI), Aviation and Shadow Flicker section of the ES.

Shadow flicker may occur under certain combinations of geographical position and time of day, when the sun passes behind the rotor of a wind turbine and casts a shadow over neighbouring properties. As the blades rotate, the shadow flicks on and off, an effect known as shadow flicker. The settlements discussed in Section 3.2.7 will all be considered as receptors for shadow flicker. It is considered, however, that very few if any of these properties would be exposed to shadow flicker.

3.2.9.2 Potential Impacts

If inappropriately sited, wind turbines have the potential to:

- Interfere with telecommunications;
- Impact on the performance of the existing windfarm;
- Interfere with aviation communication systems (primarily radar communication); and
- Create nuisance to residents through shadow flicker effects.

3.2.9.3 Method of Assessment

Extensive consultations with television, radio and mobile phone operators will be carried out to inform the design of the development and assess the potential impacts upon telecommunications.

Appropriate consultation will be undertaken with the CAA, MoD and NERL in order to ensure the proposed development does not adversely affect military or civil aviation communications systems.

Shadow flicker will be assessed for the project area defined from the tower heights, rotor diameters and geographical location of each turbine for the proposed Blackwood Wind Farm development. In keeping with relevant guidance, houses outside of 10 rotor diameters will be omitted from the assessment. Assessment of any remaining properties within influencing distant will be undertaken using WindPRO and Geographical Information Systems (GIS) software.

Computer modelling will be undertaken to assess the overall impact on the performance of the Dalswinton Wind Farm.

3.3 Environmental Aspects Scoped Out

At this stage, it is proposed not to assess the proposed Blackwood Wind Farm development's impact on air quality as part of the EIA process. It is predicted that the impact of emissions (e.g. from plant, vehicles and machinery) during the construction,

operation and decommissioning of the development will not be significant, and the project area lies within a rural area of generally good air quality does not lie within an Air Quality Management Area (AQMA).[7]

Readily accessible information sources indicate that no areas of peat are recorded within the proposed development area.[8] Therefore, it is proposed to scope out peat hazard assessment and peat slide risk assessment as part of the EIA process.

[7] Information from the Air Quality in Scotland website: http://www.scottishairquality.co.uk/laqm.php interrogated on 7/10/2010.

[8] Information accessed from the British Geological Survey: http://www.bgs.ac.uk/GeoIndex/ interrogated on 5/4/2011

4 CONSULTATION RESPONSES

We welcome your views and opinions on the proposed project and the scoping exercise. Informal contact is encouraged. If you wish to discuss matters contained in this report in greater detail prior to responding to the scoping exercise, please contact RSK at:

Michael Kelly

Associate Director

RSK Environment Ltd

65 Sussex St

Glasgow

G41 1DX

Tel: 0141 418 0471

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APPENDIX 1: Figures

Figure 1 Site Location and boundary

Figure 2 Environmental Designations

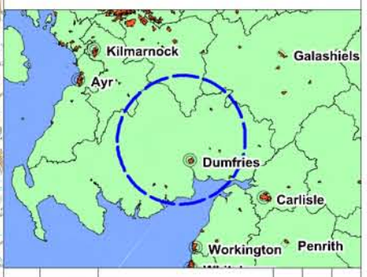
Figure 3 Zone of Theoretical Visibility (incl. Viewpoints)

Figure 4 Landscape Character Types (incl. Viewpoints)

Figure 5 Landscape designations ((incl. Viewpoints)

Figure 6 Cumulative wind farm developments base plan

Proposed Site Location



Rev	Date	Description	Drn	Chk	App
00	07.04.11	Site Location	BF	MK	MK

FORCE 9 ENERGY

Blackwood Wind Farm

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Figure 1: Site Location and Boundary

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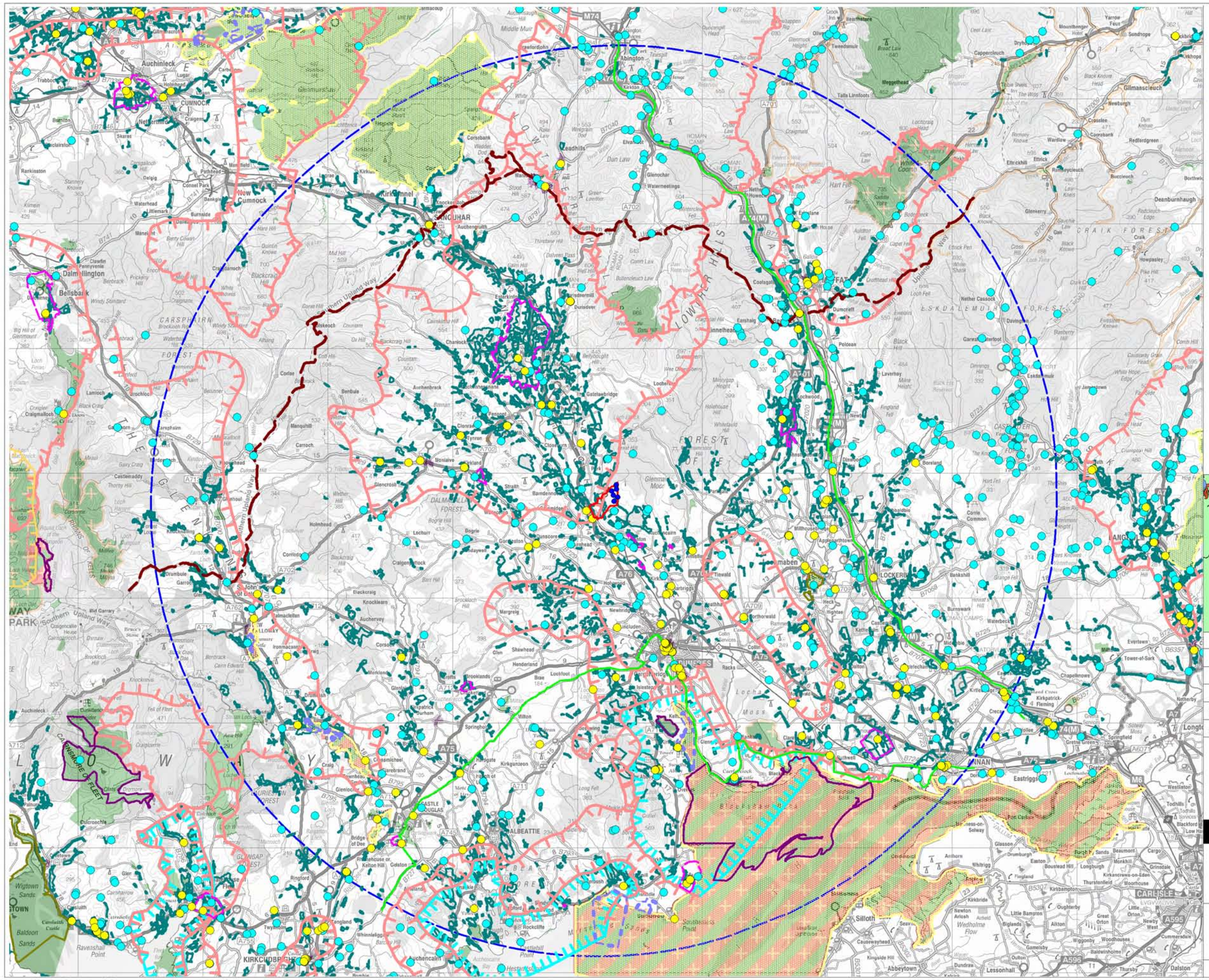
FILE NAME: T:\T190000 - RSK Scotland Glasgow\T190283 Deuchries Wind Farm\01 GIS\Figure 1 - Site Location and Boundary Wor



- Turbine Location
- Proposed Site Location
- 35km distance marker
- Conservation Area
- Historic Gardens & Designed Landscapes
- National Scenic Areas
- Local Landscape Designations
- Wildland
- Category A Listed Buildings
- Scheduled Ancient Monuments
- RSPB Reserve
- Ancient and Semi Natural Ancient Woodland
- Local Nature Reserve
- National Nature Reserve
- SPA
- SAC
- Ramsar
- SSSI
- Long Distance Paths (Southern Upland Way)
- National Cycle Route

Rev	Date	Description	Drn	Chk	App
00	12.01.11	Constraints Plan	BF	MK	MK

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Blackwood Wind Farm

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Figure 2: Environmental Designations

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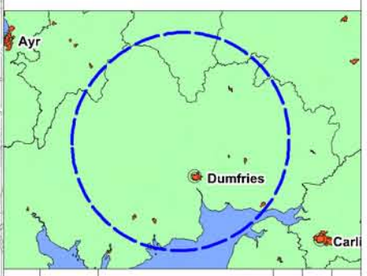
Turbine Location
Proposed Site Location
35km distance marker
Proposed Viewpoint
Zone of Theoretical Visibility

VP1: High Auldgirth
VP2: Old Brig Lane, Auldgirth
VP3: Shawsholm Road, Closeburn
VP4: Picnic spot, Drumlanrig Castle
VP5: Thornhill Conservation Area
VP6: Auldgirth Bridge, Blackwood
VP7: Ellisland Farm
VP8: Dalswinton HGDL
VP9: Maxweltown Railway Path, Dumfries
VP10: Farmhouse Tower, Caerlaverock Wetland Centre of Landscape Significance)
VP11: Lambhill Terrace, Lockerbie
VP12: Throughgate House, Throughgate



Rev	Date	Description	Drn	Chk	App
00	07.04.11	Viewpoints	BF	MK	MK

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Figure 3: Preliminary Viewpoint Plan with Zone of Theoretical Visibility

SCALE: 1:300,000 @ A3

It should be noted that the ZTV is based on Land-Form Panorama Ordnance Survey Data. This data only takes into account ground level topography and does not take into account low level screening, which may result due to hedge banks, trees or man-made structures such as buiildings, therefore it presents the maximum theoretical visibility.

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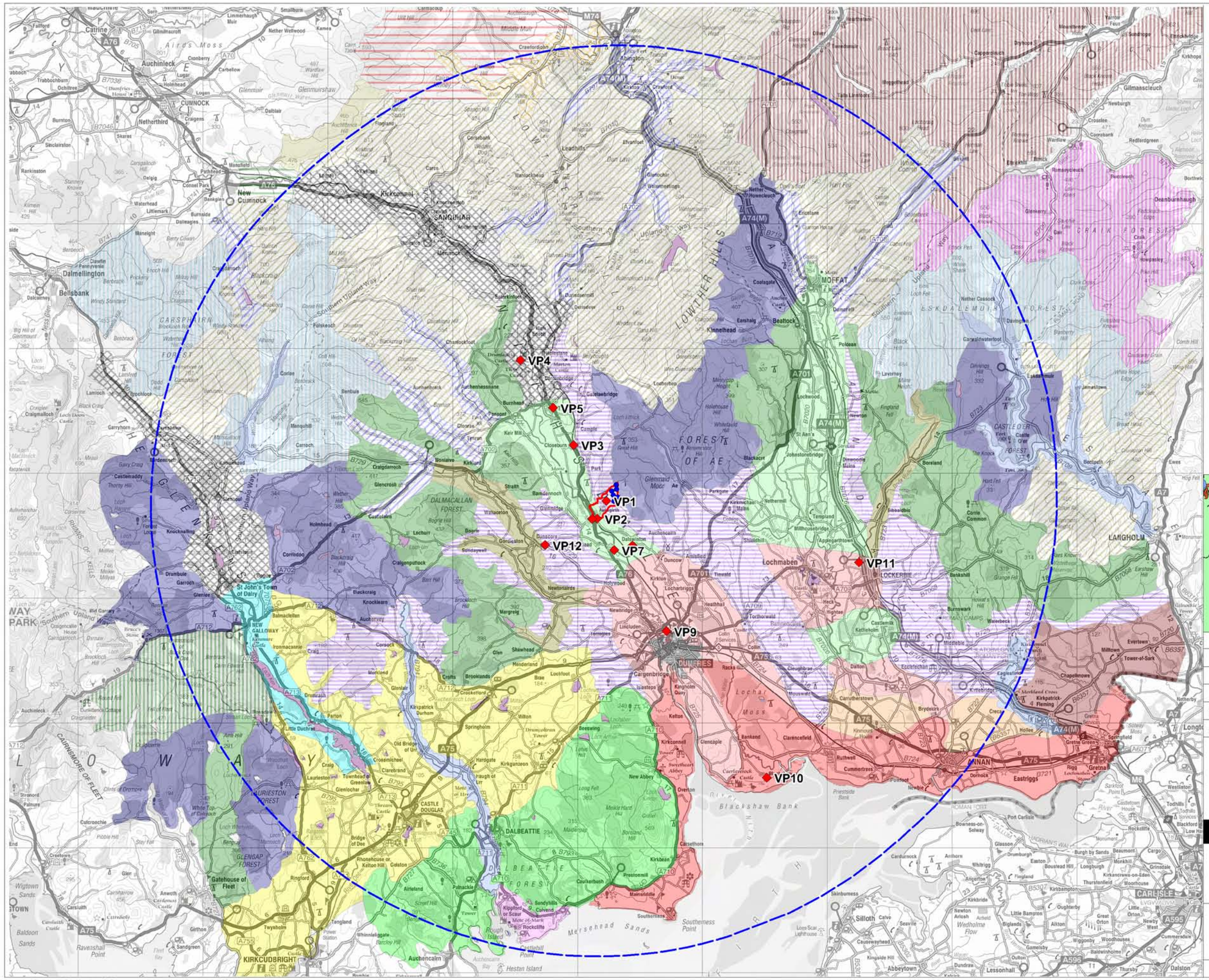

Turbine Location
Proposed Site Location
35km distance marker
Proposed Viewpoint
Coastal Flats
Coastal Granite Uplands
Coastal Island
Coastal Plateau
Drumlin Pastures
Flooded Valley
Flow Plateau
Foothills
Foothills With Forest
Inland Loch
Intimate Pastoral Valleys
Loch Island
Lower Dale (Valley)
Middle Dale (Valley)
Narrow Wooded River Valleys
Peninsula with Gorsey Knolls
Plateau Moorland with Forest
Plateau Moorlands
Rugged Granite Uplands with Forest
Southern Uplands
Southern Uplands Forest Covered
Southern Uplands with Forest
Southern Uplands with Scattered Forest
Upland Fringe
Upland Glen
Upland River Valleys
Upper Dale (Valley)
Upper River Valleys
Urban

Rev	Date	Description	Drn	Chk	App
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Blackwood Wind Farm

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Figure 4: Landscape Character Types

SCALE: 1:300,000 @ A3

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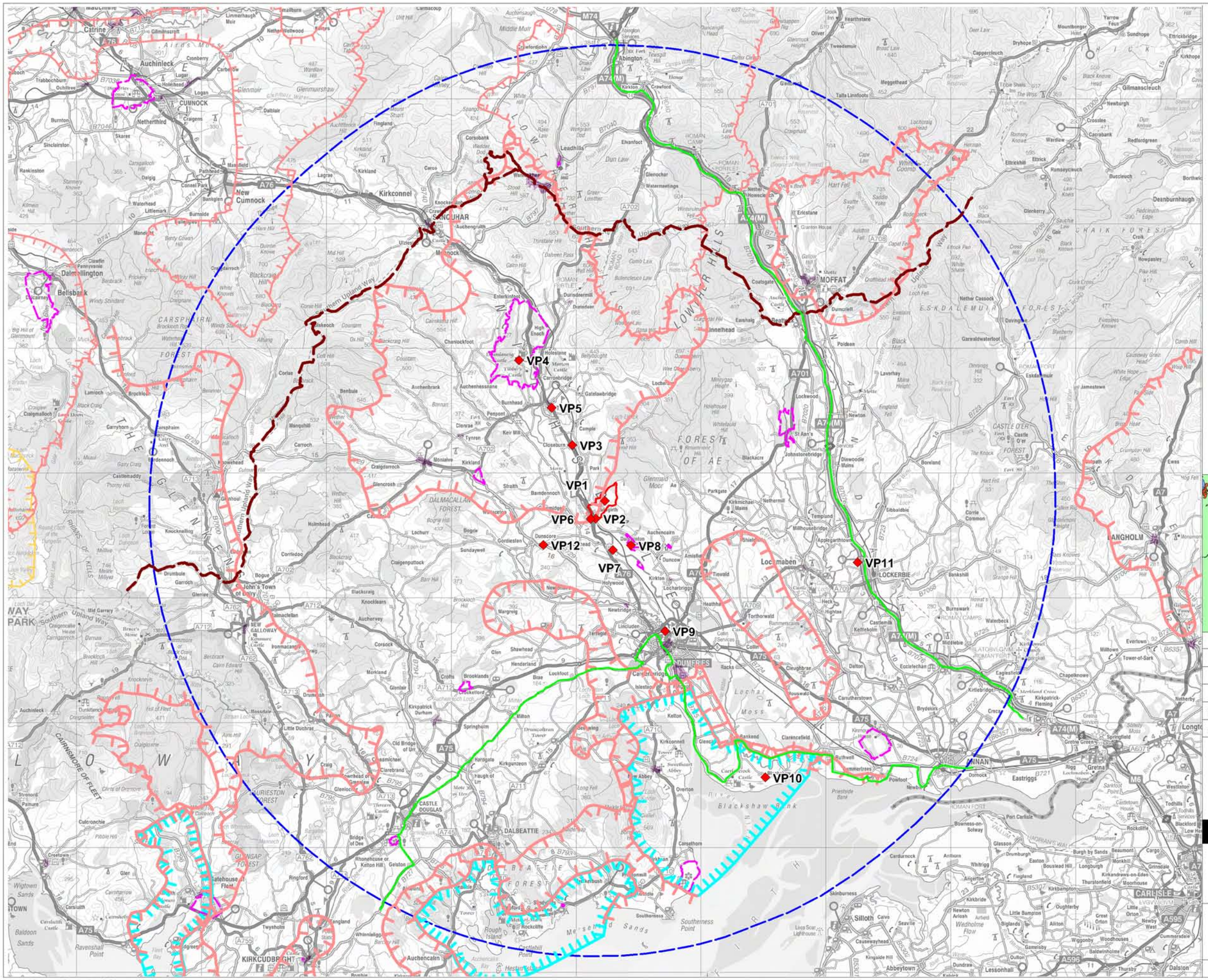

Turbine Location
Proposed Site Location
35km distance marker
Proposed Viewpoint
Conservation Area
Historic Gardens & Designed Landscapes
National Scenic Areas
Regional Scenic Areas
Other Local Landscape Designations
Wildland
Long Distance Paths (Southern Upland Way)
National Cycle Route

Rev	Date	Description	Drn	Chk	App
00	12.01.11	Constraints Plan	BF	MK	MK

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Figure 5: Landscape Designations

SCALE: 1:300,000 @ A3

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Turbine Location
Proposed Site Location
60km and 35km distance marker
Operational
Consented
In Planning
Pre-Application

Wind Farm Key

1 Dalswinton
2 Auchencairn Forest
3 Harestanes/Forest of Ae
4 Harestanes
5 Minnygap resubmission
6 Barnbackle
7 Blackcraig, Glenkens
8 Doon Hill
9 Carlesgill Hill
10 Wether Hill
11 Ewe Hill
12 Margree Windfarm
13 Newfield Wind Farm
14 Cairn Hill
15 Ulzieside
16 Whiteside Hill
17 Minsca Farm
18 Clyde Wind Farm
19 Leadhills Wind Farm
20 Windy Standard
21 Afton Windfarm
22 McCrierick's Cairn
23 Hare Hill Extension
24 Windy Standard Extension
25 Hare Hill

Rev	Date	Description	Drn	Chk	App
00	07.04.11	Cumulative Plan	BF	MK	MK

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Blackwood Wind Farm

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Figure 6: Cumulative Wind Farm Baseplan

SCALE: 1:600,000 @ A3

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