INTRODUCTION

This non-technical summary summarises the Environmental Statement which accompanies an application for planning permission made to Dumfries and Galloway Council under the Town and Country Planning (Scotland) Act 1997 (as amended), for the construction and operation of a wind farm at Knockendurrick.

KNOCKENDURRICK

Banks Renewables is proposing to develop a seven turbine wind farm at ‘Knockendurrick’ located on Irelandton Moor, north of Twynholm and east of Gatehouse of Fleet in Dumfries and Galloway.

If consented the development would utilise the area’s exceptionally high wind resource to provide renewable energy to the national grid while at the same time providing positive economic benefits to the local economy.

The evolution of the proposed Knockendurrick Wind Farm is the result of an extensive site selection, assessment and design process. It is our view that the final proposal represents the optimal design for the site. (The optimal development being one which considering all environmental factors makes the biggest possible contribution to the Scottish Government’s 2020 renewable energy targets).

Feedback we have received from local communities, interest groups and statutory agencies has also informed the location, size and design of the proposed wind farm.

BANKS RENEWABLES

Banks Renewables Ltd (BRL) is part of the Banks Group, which has been successfully developing a range of energy projects for over 35 years and employs around 420 people in the north of England and Scotland.

Banks Renewables provides renewable energy solutions that help meet demand for energy in a sustainable and considerate way. The company’s renewable projects throughout the UK are now generating over 100MW of electricity and it is one of the largest and most successful independent renewable energy developers in the country. A further 15 projects with the capacity to generate up to 350MW are at various stages of the development process from initial site feasibility to being fully operational.

Want to know more? Log on to www.banksgroup.co.uk

The Banks Group is committed to its ‘Development with Care’ approach and as a result, all of our projects are developed in close consultation with the local communities hosting its sites, as well as carrying out extensive environmental assessments.

Banks Group offer a community partnership scheme that invites the local community to engage with and have a stake in the proposed development. This helps to ensure that sites are developed with a sensitivity to the concerns and priorities of local communities. BRL encourage local communities to become actively involved at all stages of the development process.
Why wind energy?

It is widely accepted that due to the global issue of climate change there is a pressing need to reduce CO₂ emissions. In support of this the UK government has signed a number of international agreements which are legally binding and require the UK to increase the share of renewables contributing to the countries energy needs to 15% by 2020.

The Scottish Government have furthered this target and are striving to meet 100% of Scotland’s energy needs from renewable sources by 2020.

Through generating electricity by harnessing the power of the wind as opposed to burning a mix of fossil fuels, the wind farm is expected to provide a potential saving of approximately 755,000 tonnes of carbon dioxide emissions over the 25 year lifetime.

This is equivalent to the amount of carbon emitted from supplying grid-source electricity to approximately 14,000 homes, or around 17% of the annual domestic consumption in Dumfries and Galloway.

The Scottish Government have set a number of targets in their 2020 Routemap for Renewable Energy, which was issued in 2011.

One of these targets is to achieve 500 MW of community and locally-owned renewable energy by 2020.

This wind farm can contribute to the meeting of this target under the offer to communities to take an equity stake of up to 5% in the project.

15% UK Government target for the sourcing of renewable energy by 2020

100% Scottish Government target for the sourcing of renewable energy by 2020

500MW Scottish Government target for community/locally-owned renewable energy by 2020

Why Knockendurrick?

Commercial scale wind farms can only be developed in areas where the wind resource can be converted into sufficient electrical output. Wind monitoring at Knockendurrick has proven that the area has an exceptionally good wind resource.

The Knockendurrick site is not subject to any international or national landscape, ecological or cultural heritage designations. The environmental statement has demonstrated that the site has suitable highway access and is sufficient distance from settlements and residential properties to ensure that noise and shadow flicker effects are minimised.

A detailed mapping exercise for the whole of Dumfries and Galloway was undertaken by the developer to consider the technical, environmental and planning constraints to developing a commercial scale wind farm in the region. This process mirrored a similar process undertaken by Dumfries and Galloway Council which supported the Council’s policy for onshore wind in the Dumfries and Galloway Structure Plan and highlighted that the site could be suitable to accommodate commercial scale wind turbines. The map of main constraints to wind energy development used by Banks Renewables to identify the site is reproduced here.

Following identification of the area at Knockendurrick, further desk based studies, site visits and landowner discussions confirmed its suitability and availability.

The proposed area of turbine development is over 3km from the nearest village and excellent access is provided to the site via the A75 trunk road.

The development has been considered against key national, regional and local plan policies (including interim planning policies) and it is the developer’s assessment that the proposed wind farm at Knockendurrick would comply with planning policy which promotes renewable energy developments, where environmental effects can be minimised.

It is widely accepted that due to the global issue of climate change there is a pressing need to reduce CO₂ emissions. In support of this the UK government has signed a number of international agreements which are legally binding and require the UK to increase the share of renewables contributing to the countries energy needs to 15% by 2020.

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Through generating electricity by harnessing the power of the wind as opposed to burning a mix of fossil fuels, the wind farm is expected to provide a potential saving of approximately 755,000 tonnes of carbon dioxide emissions over the 25 year lifetime.

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Through generating electricity by harnessing the power of the wind as opposed to burning a mix of fossil fuels, the wind farm is expected to provide a potential saving of approximately 755,000 tonnes of carbon dioxide emissions over the 25 year lifetime.

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Through generating electricity by harnessing the power of the wind as opposed to burning a mix of fossil fuels, the wind farm is expected to provide a potential saving of approximately 755,000 tonnes of carbon dioxide emissions over the 25 year lifetime.

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Our proposal

**KEY FACTS**

Site Area: In total the application site covers an area of 487 hectares, of which only around 9.4 hectares (2%) will be occupied by the wind turbines and their associated infrastructure, including access tracks.

Number of turbines: Seven

Rated Output: Each turbine is anticipated to have an installed capacity of 3.4MW giving a total installed capacity for the Wind farm of 23.8MW

Turbine Dimensions: Turbines will have a maximum hub height of 80 metres and a maximum height of 132 metres to blade tip.

Length of access tracks: 4.1km of existing farm access tracks on site will be used. An estimated 3.4km of new access tracks will be constructed.

Life Span: The turbines will be in place for 25 years plus around 10 months for construction and 10 months for decommissioning.

Employment: Around 30 to 57 people will be employed on site during the construction and decommissioning phases.

Vehicle Movements: An average of 67 vehicle movements per day is anticipated during the peak construction period. The number of daily loads will vary considerably over the construction period, with the majority of months having much lower levels of vehicle movements.

**SITE LOCATION**

**TURBINE DIMENSIONS**
Our proposal continued

MAIN ELEMENTS

Turbines
All turbines will be of the same height and specification, with a hub height of approximately 80 metres and a maximum height to blade tip of 132 metres. They will be of a modern three bladed design with tubular steel tower.

Each turbine will begin generating power at wind speeds of around 3 – 4 metres per second (m/s) and would shut down at wind speeds of approximately 25m/s. They will generate power approximately 70 - 85% of the time.

Foundations
The turbine foundations are likely to consist of reinforced concrete pads around 2 metres deep. Disturbance to the ground will be minimised and following construction, surface vegetation will be re-established.

Wind Monitoring Mast
The wind farm’s performance will be remotely monitored using an on site meteorological mast which will gather data on wind speeds and direction. The mast would be a free standing steel lattice design and a maximum of 80 metres in height. The temporary mast that is currently erected on the site will be removed prior to operation of the wind farm.

Site Compound
A temporary site compound will be required during the construction phase for the storage of plant and materials, and to provide site workers with welfare facilities.

Access Tracks
To access and service the wind turbines, approximately 3.4km of new access tracks will be required. 4.1km of the existing farm tracks will be upgraded. The tracks will typically be 5 metres wide, widening at bends where appropriate. The tracks will link the turbines to the public road network from the A75 via the unnamed road that leads to Ireländon.

Traffic
Traffic travelling to and from the site will use an agreed route. The preferred access route for turbine delivery is from the A75, and then utilisation a short section of unclassified road until reaction the site entrance onto Irelandton Moor. HGV traffic will not need to pass through communities close to the site.

Cabling and Grid Connection
Underground cables linking the turbines will generally be laid alongside the access tracks. A control building and on site sub station will be built in a compound area from which electricity generated by the turbines will be fed into the grid. The wind farm will make use of spare capacity on the local electricity transmission system. A preferred grid connection point at the Tongland substation has been identified.
Benefits of the project

The development will make a significant contribution to the local community; economically, socially and environmentally, in addition to assisting to meet the Scottish Government’s renewable energy targets.

• Establish a community benefits package, based upon 3% of the gross annual revenues generated by the wind farm over its lifetime, underwritten by minimum payments £5,000 per megawatt installed per annum.

• Based on estimated energy prices and wind speeds, BRL estimate that the 3% share in the annual gross revenue could equate to approximately £6.5 million over the 25 year life span of this development.

• This fund is to be reinvested into the surrounding area and will be used to finance projects identified by, and proposed within, the local community.

• An opportunity for the communities to purchase up to 5% equity in the proposed renewable generation capacity. This 5% purchase option, if exercised, would also make an important contribution towards the Scottish Governments target of 500MW of community owned renewable energy by 2020.

• Reduce greenhouse gas emissions by harnessing power from the wind to generate electricity equivalent to the annual requirements of approximately 14,000 homes* Making a contribution to the recently increased Scottish Government target of 100% of Scotland’s electricity consumption produced from renewable sources by 2020.

• Improvements to the Heritage Path footpath network including installation of interpretation boards improving public access to the countryside and understanding of the area.

• Possible support for the Galloway Red Kite Trail.

• On average of 57 people employed during construction.

• BRL also commits, ahead of planning determination, to agree with Dumfries and Galloway Council a minimum percentage of the total capital construction value of the project which will be spent locally via local contractors and businesses.

* Figures are approximate and based on site specific wind data and an average annual household electricity consumption of 3300kWh/yr
Visual assessment

The following pages show what the Knockendurrick wind farm could look like from a selection of viewpoints, which have been agreed with Scottish Natural Heritage. They have been produced by professional landscape architects in accordance with the latest Landscape Institute guidelines. They show seven turbines, 132 metres to tip. Further visualisations accompany the full planning application, please see the back page for details of where they can be viewed.

View from: A75 Twynholm Junction

View from: Gatehouse of Fleet
Visual assessment continued

View from: Rutherford's Monument

View from: A75 Balannan Junction
Visual assessment continued

View from: Kirkcudbright

View from: Kirkcudbright Lifeboat Station
Visual assessment continued

View from: Sandgreen

View from: Borgue Church
Visual assessment continued

View from: Bridge of Dee

View from: A75 Laggan
The information below summarises the findings of the assessments of the predicted environmental effects of the proposed Knockendurrick Wind Farm as described in detail in the Environmental Statement.

**Environmental effects**

**Landscape and Visual Impact**

The detailed landscape and visual assessment contained within the Environmental Statement covers a study area extending out 25km from the proposed turbines. The assessment notes that one inevitable consequence of constructing wind turbines is that they will be visible over a relatively large area. Their scale and man-made appearance mean that they will not naturally fit in with the rural landscape. It is however recognised that certain types of landscape are more capable of accommodating wind turbines than others.

The local landscape has been identified as having some capacity for wind farm development. The site is not within an area designated for its landscape value. The nearest landscape designations within the study area to the application site are the Fleet Valley National Scenic Area, the East Stewartry Coast NSA and the Galloway Coast Regional Scenic Area.

The closest turbine to the NSA would be 2.8km distance. The assessment notes that although much of the Fleet Valley NSA is indicated as having theoretical visibility in the proposed wind turbines, in practice the extensive tree cover within the NSA and in the areas separating the wind farm site from the NSA, the presence of buildings obstructing views, and localised variations in topography, will reduce the extent to which the proposed development would be visible from the NSA. There would therefore be much less scope for adversely affecting the special qualities of the area, than might be assumed.

The landscape and visual impact assessment has identified a range of both landscape and visual effects. The assessment concludes that the proposed development will not have an adverse effect on the special qualities of the designated landscapes within the study area and that the wind farm has been designed to relate well to the local landscape character and respect its scale.

With the exception of one viewpoint (of the 30 used in the assessment), it has been assessed that there would be no significant effects on landscape character or visual amenity beyond two kilometres of the site. For the nearest settlements to the development, Gatehouse of Fleet, Twynholm and Kirkcudbright, the assessment concludes that significant effects would occur for a few areas in these settlements, but that the majority of areas within the settlements will not have significant effects as there would be no visibility of the proposed turbines. Accordingly, the overall impact on these settlements is not significant.

Of the 20 residential properties within two kilometres of the nearest wind turbine, six have been assessed as being likely to experience potentially significant effects. However the assessment has concluded that there would be no overbearing effect on the visual amenity at any of those properties.

The landscape assessment notes that the area around the proposed wind farm has already been utilised for wind turbine developments with several farm scale turbines which have been consented but not constructed in the area. As a result, a cumulative assessment was carried out to assess the landscape impact from the addition of Knockendurrick to the area.

The assessment has concluded that the cumulative landscape and visual effects, arising from the addition of the development to the other operational and approved wind turbines, will be not significant.

It should be remembered that the significant visual effects of the development are reversible. Upon decommissioning the wind farm, the turbines would be dismantled and removed and the site restored. The landscape and visual impact assessment concluded that in landscape and visual terms, the site is a suitable location for a wind farm development.

**Ecology and Ornithology**

A number of ecology and ornithology surveys were carried out on the proposed development site in order to gain a full understanding of the ecology and ornithology of the site and the sensitivity of species in the area. The site does not lie within any statutory nature conservation designations. The closest such sites are the Laughenglue and Arlice Hills SSSI approximately 3.4km from the site and the Galloway Oak Woods Special Area of Conservation (SAC) combined with the Killegowan Wood SSSI approximately 4.6km west of the site.

The layout of the site took account of the results of the ecological surveys for bats, Great Crested Newts, Natterjack Toad, Otter, Water Vole, Badger, Reptile and fish throughout the design process. Measures were included within the design to minimise potential impacts upon key habitats. This included the design of the turbine and access track layout to avoid the most sensitive/important habitats within the survey area, and the implementation of stand-off distances of at least 50m between the blade tips and the top of features found to be used by bats.

Potential effects on birds arising from the construction and operation of the wind farm are predicted to be negligible. An ecologist will monitor all construction works undertaken during the bird breeding season (March to August) to ensure that disturbance to breeding birds is minimised by the implementation of a Breeding Bird Protection Plan.

Based on the surveys and assessment completed, it is not considered that the proposals will result in significant impacts upon any species of ecological and ornithological value within the site; predicted impacts are considered to be of no more than minor significance upon the habitats and protected species which have been shown to be present, either through the construction/decommissioning or operational phases.

**Cultural Heritage**

An archaeological and cultural heritage assessment has been carried out. The assessment looked at the potential for direct effects (physical) and indirect effects (setting) on known features of historical importance. A cumulative assessment on the setting of cultural heritage resources of the development in combination with other wind energy developments was also carried out.

It was identified that there is one scheduled ancient monument within the site boundary and no listed buildings, historic parks and garden or conservation areas.

Direct effects of minor significance have been predicted for two features within the application site and negligible significance for two other features within the site. These effects are not considered to be significant. Archaeological mitigation measures will be undertaken to offset these predicted direct effects. The completion of the programme of archaeological mitigation works will compensate for the loss of the archaeological resource that will occur as a result of the construction of the development.

An indirect effects of moderate significance on the scheduled cairn at Cairstoch Hill has been identified. It is not however considered that the development would unacceptably diminish the ability to appreciate this feature or the cultural heritage resource within the study area.
Noise

The development is located within a relatively rural location where existing background noise levels are low to moderate. The predominant noise sources in the area are wind induced noise (wind passing through vegetation and around buildings), distant and local road traffic noise, agricultural noise and birdsong.

CONSTRUCTION

The construction noise assessment concluded that construction noise levels would be within acceptable guidelines and there will be no significant effects. All predictions assume that all plant is operating in full operational mode on the access tracks and within the site itself to provide a worst case scenario, whereas, in reality only a proportion of the plant may be operating.

OPERATION

Consultation was undertaken with the Environmental Health Department at Dumfries and Galloway Council in order to agree the approach to the noise assessment and the noise monitoring locations. 11 properties were identified as locations to measure background noise levels. For all properties predicted operational noise levels for the Knockendurrick Wind Farm would be within noise limits.

The cumulative noise assessment has taken into account noise that would be generated by the consented wind turbines at farms nearby. Cumulative effects would lead to an increase in noise levels at some properties. However, predicted cumulative operational noise levels and measured background noise levels indicate that for dwellings neighbouring the Development, cumulative wind turbine noise will meet the noise criteria government guidance (ETSU-R-97); therefore, the operational noise effects are deemed not significant.

There are a range of turbine models that may be appropriate for the Development. If the wind farm receives consent, further data will be obtained from the supplier for the final choice of turbine model to demonstrate compliance with the noise limits derived.

TRAFFIC AND TRANSPORT

The Knockendurrick site is very well situated in relation to the A75 which can accommodate wind farm construction traffic, with only a short distance to site after leaving this road.

An assessment of the effects due to increased traffic as a result of the construction of the development has been undertaken.

The maximum impacts are predicted to occur in month five of the construction programme when an average of 38 Heavy Good Vehicle (HGV) movements per day. The number of daily loads will vary considerably over the construction period, with the majority of months having much lower levels of vehicle movements.

Impacts are predicted to be greatest on the section of the short section of C class road in the vicinity of the site entrance. However, with the implementation of mitigation measures which would include an appropriate traffic management plan, it is not predicted that any significant effects would be experienced.

Vehicle movements resulting from management and maintenance of the development during operation would be low in volume and have no significant effects. Effects as a result of the decommissioning of the development are anticipated as being less than during construction and would not be significant.

GROUND CONDITIONS AND HYDROLOGY

An assessment of the likely effects on ground conditions, underlying geology, hydrology and hydrogeology has been undertaken. Potential effects have been mitigated through design of the development, which maximises the use of existing access tracks and avoids sensitive areas as far as possible.

The length of required access tracks and number of watercourse crossings have been minimised as far as possible. In addition, careful management of construction and operation works in line with an environmental management plan and a construction method statement would mean that the development would result in no significant effects to ground conditions or hydrology.

PEAT STABILITY

Shallow peat deposits were identified across the site, and the site design avoided these as far as possible.

Within the developable area of the site, peat probing was carried out to ascertain the likely effects on peat stability. Where they were found they were generally to a depth of less than 0.2m. One area of deep peat was identified within the site boundary. This area is unaffected by the proposed development.

A preliminary peat slide risk assessment was carried out in line with best practice guidance that concluded that conditions conducive to peat instability are very unlikely to be present. No significant effects are anticipated.

SHADOW FLICKER

Under certain combinations of weather conditions, times of year and geographical position, the sun may pass behind the rotor of a wind turbine casting a shadow over the windows of nearby properties that appears from within the property to flick on and off when the blades rotate. This effect is known as shadow flicker.

Under worst case conditions, and not taking into account periods when climatic conditions prevent shadows being cast or any intervening vegetation or structures, it is predicted that the maximum occurrence of shadow flicker would be 11.2 hours per year at one property. In reality, taking into account factors that limit occurrence, this figure is predicted to be around 3.2 hours per year. No significant effects are predicted.

Should shadow flicker be found to cause a nuisance during operation of the development measures would be incorporated by the applicant that reduce the occurrence of shadow flicker at the affected property.
Other considerations continued

AVIATION
The aviation assessment has considered the potential impacts on both civil and military aviation interests. The development has potential to impact on the civilian air traffic control radar at Lowther Hill and Great Dun Fell which are the responsibility of National Air Traffic Services En-route Ltd (NATS).

Discussions between the applicant and NATS are ongoing and NATS has indicated that the implementation of a solution involving the upgrading of these radars has potential to resolve the issue.

The application site lies within Military Low Flying Area 16 and (when active) Tactical Training Area 20T. These areas cover large tracts of central and southern Scotland including Dumfries and Galloway, Scottish Borders and South and East Ayrshire.

It is highly likely that the MoD will request that some or all of the turbines be fitted with appropriate aviation lighting (which may be infra red, and therefore invisible to the naked eye).

In accordance with guidance in this respect and the recommendations of the aviation assessment the applicant is maintaining a dialogue with representatives of the MoD in relation to this matter with a view to agreeing an appropriately worded planning condition.

EXISTING INFRASTRUCTURE
The presence of existing infrastructure such as service pipes and cables, TV transmission, mobile telephone networks and electromagnetic paths were considered and consultation with relevant bodies including Atkins, JRC and Ofcom revealed no existing infrastructure or objections.

PUBLIC ACCESS
There is a single Heritage Path within in the Application Site. It is proposed that appropriate sign posting will be agreed with the Council to inform users of both the Heritage Path and the proposed development’s access track of Health and Safety requirements during construction.

In response to feedback from local residents it is proposed that the condition of this path will be improved and interpretation material provided thereby improving public access to the countryside.

Looking at the wider footpath network in the area, the applicant is also examining opportunities to support the continued work of the RSPB and the Galloway Red Kite Trail centred on the River Dee Valley to the north east of the application site.

EXISTING INFRASTRUCTURE

The Environmental Impact Assessment has identified and designed process involving consultation with statutory consultees, local interest groups and the local community.

Environmental constraints and considerations have been taken into account in the site layout and design process. This has enabled most potentially significant effects to be avoided. Further measures to prevent or reduce any remaining significant environmental effects are described in detail within the Environmental Statement.

Commercial scale wind turbines have similar effects wherever they are located because of their inherent nature of the technology and the type of sites which are suitable or their operation. Mitigation measures have been put forward where appropriate for construction, operation and decommissioning phases to ensure that any adverse effects are minimised.

The Environmental Impact Assessment has demonstrated that the development would have some localised significant impacts on the landscape character and visual amenity within two kilometres of the development, as would be expected from this type of development. With the exception of one viewpoint, it has been assessed that there would be no significant effects on landscape character or visual amenity beyond three kilometres of the site. The site design was amended to avoid adverse impacts to the environment. Turbine locations were revised to ensure the special qualities of the Fleet Valley National Scenic Area were maintained.

The cumulative impact assessment which considered the impact of Knockendurrick Wind Farm in combination with other consented, operational wind turbine developments concluded that there would be no additional significant effects.

Conclusions

The proposal for a wind farm at Knockendurrick has been subject to extensive site identification and design process involving consultation with statutory consultees, local interest groups and the local community.

The environmental studies concluded that mitigation would be required to reduce the potential ecological impact on species within the site during construction and onsite archaeology. However, with the successful deployment of mitigation, the potential impacts will be reduced to an acceptable level.

The proposed development would represent an important environmental benefit in the generation of electricity from a renewable energy source that will reduce or avoid the use of fossil fuels through the displacement of electricity generated from renewable energy. The proposed development would generate enough electricity for 17% of Dumfries and Galloway’s households.

The proposed development will also lead to some beneficial effects in relation to its employment creation during construction. It also will deliver significant local environmental and economic benefits by improving the local footpath network and providing the opportunity for local communities to benefit from investment in new renewable generating capacity.
Further information

Further information regarding the wind farm can be obtained from Dumfries and Galloway Council at the following address where the environmental statement and accompanying documents are available for review:

Dumfries and Galloway Council
Development Management
Kirkbank
English Street
Dumfries
DG1 2HS

CD copies (at a cost of £5) of the application can be obtained by contacting Banks Renewables on the details shown below