



Lochelbank Wind Farm

Non Technical Summary

npower renewables

April 2005

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Lochelbank Wind Farm: *Non Technical Summary*

April 2005

Reference 0024693

For and on behalf of Environmental Resources Management
Approved by: _____ Simon Hewitt
Signed: _____ 
Position: _____ Partner
Date: _____ April 2005

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**LOCHELBank WIND FARM ENVIRONMENTAL STATEMENT
NON TECHNICAL SUMMARY**

npower renewables

1

INTRODUCTION AND LEGISLATIVE FRAMEWORK

This document is the Non Technical Summary of the Environmental Statement for the proposed Lochelbank Wind Farm. The Environmental Statement was prepared to support an application to Perth & Kinross Council by npower renewables⁽¹⁾ (NR) for permission to develop a wind farm at Lochelbank.

Under the *Town and Country Planning (Scotland) Act, 1997*, consent to construct and operate a wind farm with a capacity of under 50MW ⁽²⁾ is required from the relevant planning authority, in this case Perth & Kinross Council. Under the *Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000*, an Environmental Impact Assessment (EIA) must be carried out, before consent is granted for wind generation projects, if they are over 5MW or 5 turbines and likely to have significant effects on the environment.

The Environmental Statement identifies and describes the environmental impacts of construction, operation and decommissioning of the wind farm taking into account the characteristics of the development, the sensitivity of the local environment and the concerns of interested parties. It describes measures that will be taken to reduce adverse impacts and maximise environmental benefits, and evaluates the significance of resulting impacts. The Environmental Statement also describes the main alternatives considered by the developer in planning the project, and examines the cumulative impacts of the scheme in conjunction with the consented windfarm at Braes of Doune and other similar proposals in the area, including proposed wind farms at Abercairney, Burnfoot Hill, Calliachar, Clatto, Drumderg, Earlsburn, Green Knowes, Griffin, Knowehead, Little Law, Logiealmond, Mellock Hill, Snow Goat Glen, and Tillyrie.

If approved the scheme will be developed through a design and build contract and the detailed design and construction methodology will be developed by the chosen contractor. This will be in accordance with essential design parameters specified in the contract, and incorporating mitigation

(1) NR is a subsidiary company of the RWE Innogy Group.

(2) Electricity generation projects which fall below 50MW are authorised under the *Town and Country Planning (Scotland) Act, 1997*. Those that are over 50MW are required to be authorised under *Section 36 of the Electricity Act, 1989*.

requirements set out in the Environmental Statement and any conditions attached to the grant of consent.

2 **THE SITE**

Lochelbank is located in Perth & Kinross in the north eastern part of the Ochil Hills, approximately 10km south of Perth, as shown in *Figure 1*. To the east lies the M90 Perth-Edinburgh motorway, and to the south and west, a minor road which runs north west from the village of Glenfarg to Ardargie. The site occupies 187 hectares of upland on Dron Hill and Berry Hill, with a maximum elevation of around 280 metres. An access track to the site will follow an existing route from the Wicks o' Baiglie Road past the farm at Lochelbank, to the turbine area.

Key features on and around the site are shown on *Figure 1*.

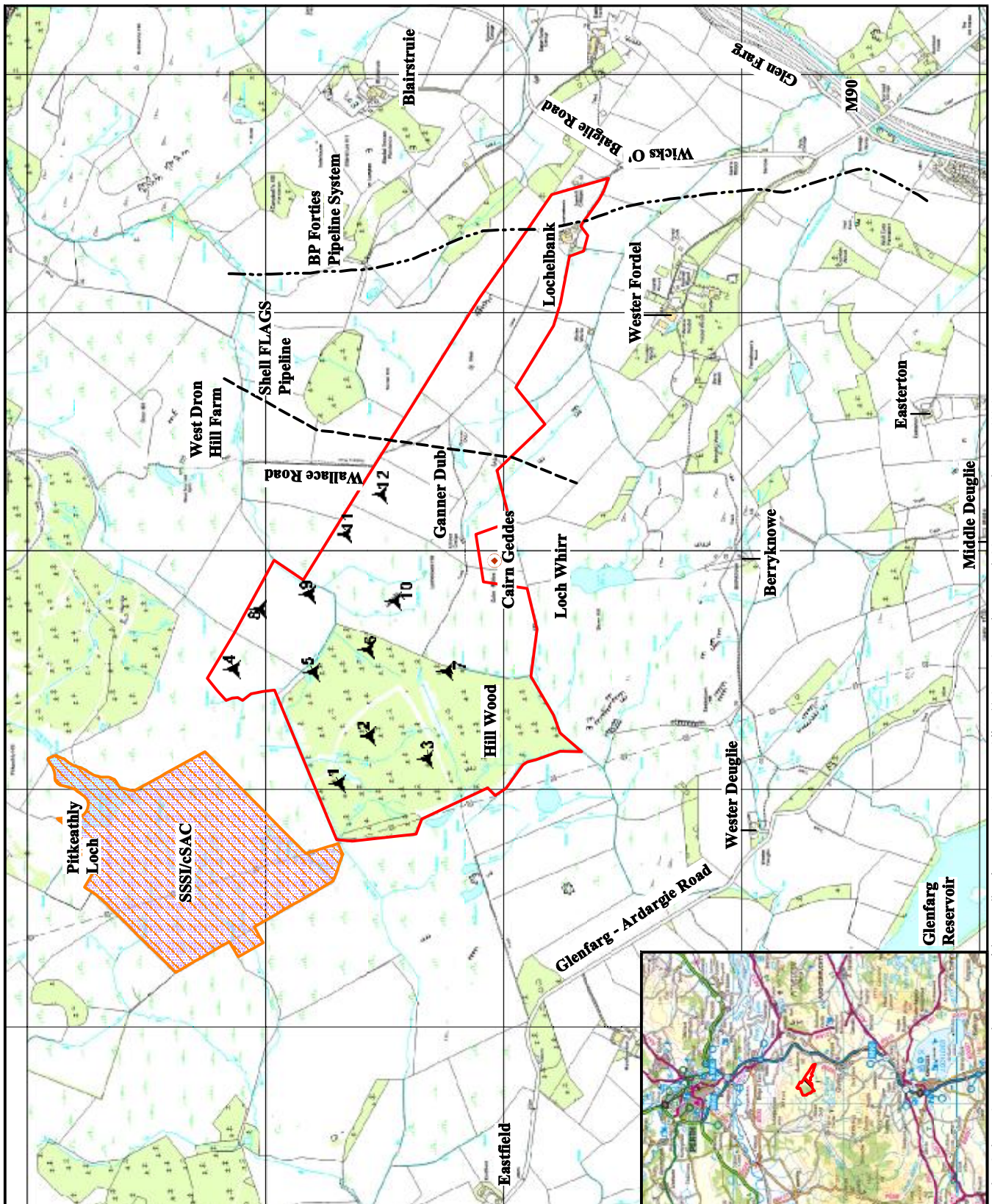
The site consists of upland pasture and moorland, with areas of coniferous plantation and shelterbelts, and small areas of deciduous woodland. The boundary encloses land from several farm holdings, including Fordel, Berry Knowe, Blairstruie and Lochelbank. Rough tracks cross the area. There is a communications mast close to Lochelbank and an electricity pylon carrying a 275kV line at the western edge of Hill Wood. Two pipelines cross the centre and eastern half of the site.

3 **THE LOCHELBANK WIND FARM PROJECT**

The wind farm will comprise twelve approximately 1.3 megawatt (MW) turbines with a total generating capacity of about 16MW. The locations of its principal components are shown on *Figure 2*. They are:

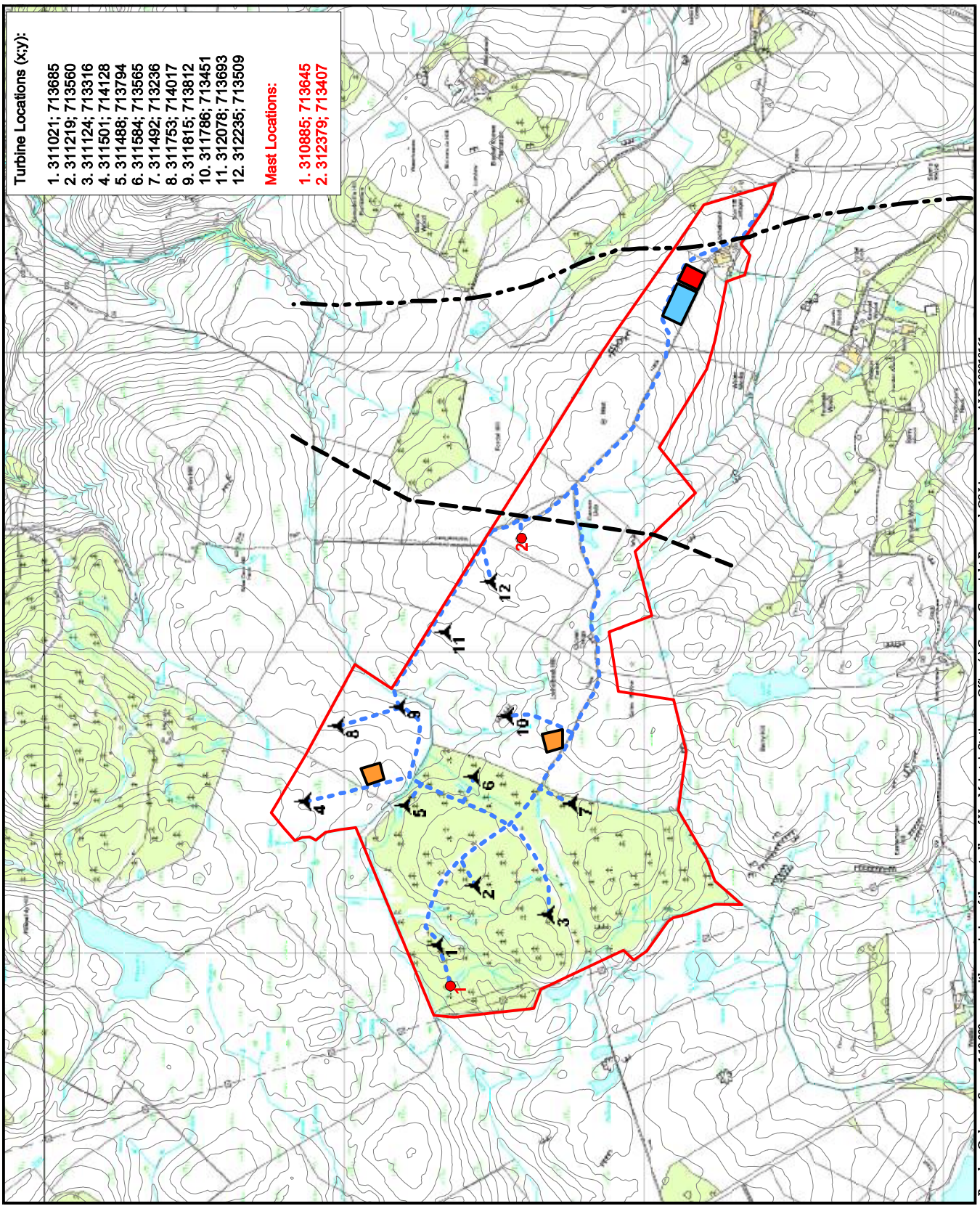
- 12 wind turbines based on buried concrete foundations within an excavation of approximately 16 x 16 metres in size. Each turbine will have a base diameter of 5 metres with a 1 metre wide gravel path around it;
- two crane hard standing areas per turbine (24 in total), of footprint 20m x 20m for the main crane and 20m x 10m for the tail crane;
- two anemometer masts on excavations which will be about 6 x 6 metres in size;
- an access track from Lochelbank and internal tracks between the turbines, comprising 2km of existing track to be upgraded and widened to 4.5 metres, and 4.5km of new 4.5 metre wide track. Additional land will also be occupied by cuttings and embankments created to form the tracks;
- a roadside drainage system and about 6.5km of trenches for cables; and

Figure 1 Site Location	
Project: 24693 - Lochelbank Wind Farm	
Client: <i>power renewables</i>	
Legend:	 Turbine  Site boundary  Candidate Special Area of Conservation (CSAC)  Site of Special Scientific Interest (SSSI)  BP pipeline  Shell pipeline  Cairn Geddes
 NORTH SCALE  0 0.25 0.5 Kilometres	
 Environmental Resources Management ERM	
Drawn By: ERM	PM: AUM SH: SH Date: 29/03/05



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Figure 2 Scheme Components	
Project: 24693 - Lochelbank Wind Farm Client: <i>power renewables</i>	
Legend:	Site Boundary Mast Internal Access Tracks Masts Construction Compound Operations and Control Building Borrow Pits Shell FLAGS Pipeline BP Fortier Pipeline System
NORTH SCALE 0 0.25 0.5 Kilometres	
ERM Environmental Resources & Management	
Drawn By: ERM	PM: AUM PD: SH Date: 02/03/05



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- a 15 x 6.5 metre operation and control building and store and a small car park located at Lochelbank.

In addition, a temporary construction compound and two temporary works areas, each 100 metres x 50 metres (total 15,000m²) and two borrow pits (each 60m x 100m, totalling 12,000m²) will be required to build the wind farm.

The total site occupies about 187 hectares of which about 4.7 hectares will be occupied by permanent structures and hard surfaces, a further 3.9 hectares will be used only temporarily during construction, and additional land, in the order of 7.5 hectares in size, will be used for the construction of track cuttings and embankments.

Construction of the wind farm will take about 10 months. A Draft Construction Method Plan is included in the Annexes to the ES and will be further developed and agreed with Perth & Kinross Council, Scottish Natural Heritage (SNH) and the Scottish Environment Protection Agency (SEPA), to control the conduct of construction works. This includes detailed method statements for particular works presenting risks of adverse effects on the environment, including for statements for burn crossings and forest felling.

At the end of the construction period the site will be restored according to a Restoration Statement to be included as part of a Construction Method Plan. For the operating life of the wind farm a Management Plan will be developed and implemented, again in agreement with the parties noted above, and designed to maintain and improve the ecological and landscape value of the site. At the end of its operating life the wind farm will be dismantled and removed, except for the buried turbine foundations which will be left in place as their removal is likely to cause greater impact than leaving them in place, and the site will be restored to open countryside. An Ultimate Restoration Plan will be agreed for this phase.

4 SUMMARY OF IMPACTS

The Environmental Statement reports the predicted impacts of the scheme, during construction operation and decommissioning, and these are summarised below. Where measures are proposed to mitigate adverse impacts, or to provide environmental benefits, key points are noted.

4.1 LAND USE AND AGRICULTURE

During construction the whole 187 hectare site will be temporarily removed from agricultural use. 4.7 hectares of the site will be permanently occupied by structures and hard surfaces associated with the wind farm (see *Section 3*,

above), but the remainder will be returned to grazing or woodland on completion of construction.

To allow work on the site, about 66 hectares of coniferous forest will be felled at Hill Wood. This is a young coniferous plantation and its felling will enable restoration of more natural habitats to mirror those found to the north of the area.

During construction, strict controls will be exercised over methods for the removal of vegetation and soils, and for their storage and replacement. Measures will also be implemented to protect soils and vegetation not directly affected from damage by vehicle movements and other construction related activities.

There will be no direct loss of built property.

4.2

RECREATION AND TOURISM

There is a well-used footpath through the east of the site leading to Wallace Road, which is an historic route extending from the north eastern boundary of the site. This footpath will remain open during operation and through the majority of the construction phase, apart from short periods when works will require the closure of sections of the path. Appropriate temporary diversions will be installed during these times to allow access and use of the route to be maintained. No short or long term physical impacts on the footpath or associated recreational use are therefore predicted to occur.

Ice throw is only deemed a potential problem where there is the possibility of human receptors being in close proximity to the turbines. There is one turbine (number 12) located within 200m of a footpath (Wallace Road). Experience from other NR operated wind farms indicates that the resultant risk from icing is very low. Monitoring of temperature and icing being carried out at the site anemometry mast, as well as early operational experience will input into a detailed risk assessment. This assessment will consider the likely impacts of icing on walkers, visitors and maintenance crew. Appropriate mitigation measures will be agreed with Perth & Kinross Council.

There is a network of other informal routes across the site that are sometimes used by the public. Once construction is complete these will remain available for use as they are today.

The wind farm site is in an area of importance for tourism but it is not possible to predict the effect of the development on this activity. Evidence on the effect of wind farms on tourism is currently inconclusive, with recent studies providing conflicting findings about actual and perceived effects. It is likely that it will have both positive and negative effects depending on the attitudes and perceptions of individual visitors and the purpose and pattern of their visits. It will become a new landmark in the area, and may draw tourists who are already in the area who are interested in wind farms. No visitor facilities

will be provided as part of the project, but people will be free to use public paths such as Wallace Road to view the site once construction is complete.

4.3 *GEOLOGY AND HYDROGEOLOGY*

The scheme will have no significant permanent impact on the geology (surface deposits or bedrock) of the site or on any features of geological importance.

Groundwater beneath the site, and potential impacts relating to the proposed wind farm construction and operation, have been identified as follows.

- There is the potential for minor changes to the water table caused by alterations in run-off and site drainage. These effects will be localised, and are not expected to cause significant drying of soils, or affect plant communities or erosion rates.
- The effects of permanent drainage works along tracks and at the turbine sites on groundwater in the underlying drift geology will be localised and minor, and limited by the general variation in topography across the site.
- It is not anticipated that the underlying bedrock groundwater levels will be affected.

Fourteen private abstractions have been identified near the site, but are not predicted to be adversely affected. The Construction Method Plan will, however, consider these supplies in greater detail.

4.4 *SURFACE HYDROLOGY, WATER QUALITY AND SITE DRAINAGE*

A number of water bodies, watercourses and field drains cross the landscape in the vicinity of the proposed site. Although limited flow and water quality data are available, classifications for the River Farg and Water of May, running close to the site, are 'good' and 'excellent', respectively. Fisheries consultations indicate that these two watercourses are important salmon and sea trout spawning tributaries of the River Earn. In addition, the Dron Burn which drains away from the site to the north east was recognised as a potentially important sea trout spawning stream during a site visit undertaken by Tay DSFB during January 2005. There is also known to be a trout fishery on Glenfarg Reservoir.

The wind farm site lies at the upper reaches of all these watercourses and due to their limited size and/or the presence of physical barriers such as waterfalls, migratory fish are not predicted to penetrate up any of the streams as far as the site. However, significant populations of juvenile trout and salmon are likely further downstream.

Otters have been recorded at Loch Whirr and Pitkeathly Loch, in the vicinity of the site. The Pitkeathly Mires cSAC and SSSI is also located a short distance from the proposed location of the wind farm.

Potential impacts to hydrology, water quality, site drainage and their effects upon protected species and areas are summarised below together with proposed measures to mitigate potential effects.

- Turbine foundations, other hard standing areas, roadside drains and cabling trenches may intercept natural drainage channels and cause modifications to burn drainage areas. Drains and ditches will be designed to minimise potential effects, and the overall magnitude of modifications to the drainage pattern is predicted to be minor and is not expected to cause any significant impact upon resources for supply.
- Runoff from any large hard standing areas will be drained to the surrounding land which will act as a buffer zone to slow runoff, to attenuate the flood peaks, and allow sediments to settle. The final design will be developed as part of the CMP.
- The removal of Hill Wood will decrease rates of rainfall interception, and hence increase the total amount of runoff and the magnitude of flood peaks. To minimise any increase in runoff, land drains will be blocked up to allow the area to drain naturally, encouraging natural wetland areas to form. This will reduce the drainage density in the deforested areas, reduce flow rates within the drainage system, and attenuate flood peaks.
- The proposed tracks will cross a number of burns and open channel land-drains, and are likely to have a local impact on flows. As the site is in the upper parts of the catchments, effects in the larger downstream catchment areas will be minor. All burn crossings will be designed in accordance with best practice guidance by SEPA and the Scottish Executive and methods will be agreed in advance with the Council, SEPA and SNH as part of the CMP.
- During construction, there is the potential for impacts to water quality from the use of cement, fuel and oils, the operation of construction traffic and equipment on the site, and the mobilisation of silts and sediments. Polluting materials could enter and contaminate surface watercourses or groundwater from these sources as a result of accidental spillage, leakage of stored materials, incorrect use of toxic substances, and runoff during storm events. Any pollution incident could be significant for local burns and lochans, and associated protected species and areas. To minimise potential risks, a pollution prevention and emergency response plan will be developed and implemented during construction and equipment provided to contain and clean up any accidental releases. The plan will be developed according to best practice guidance and advice.

- In addition to the plan referred to above, measures to prevent pollution from occurring have been developed and integrated into the design of the wind farm. Such measures include the use of sulphate resistant concrete, and restrictions on the transfer, movement and use of potentially polluting materials.
- Clearance of the site and forest felling will expose surfaces and may lead to increased erosion and runoff of sediments into watercourses, which can be damaging to fish. Increases in erosion will be minimised through the adoption of felling methods and working practices recommended by Forestry Commission guidance. Measures will also be taken to trap sediments and minimise their entry into surface waters.
- Due to hydrological differences and natural barriers identified between the proposed wind farm site and Pitkeathly Mires cSAC and SSSI, it is considered unlikely that any potential impacts associated with the construction or operation of the wind farm would affect this protected site.

4.5

LANDSCAPE RESOURCES AND CHARACTER

The wind turbines and anemometer masts will add man made elements to the landscape, becoming a new landmark feature and a point of reference in views from the wider area. Each turbine foundation and set of crane pads, and the new tracks, will displace the existing land cover of grassland, or coniferous plantation forest and will create breaks in existing boundary fences. The felling and replacement of coniferous forest with grassland and some broadleaved woodland and the enlargement of two borrow pits will also change land cover, although careful restoration will successfully blend these features back into the landscape and provide opportunities for increasing landscape and ecological diversity in the future.

Altogether these developments will result in a major change in the local landscape causing a direct impact of substantial significance upon landscape character. No landscape resources of particular note will be affected directly, but the character of the site will be significantly altered.

Landscapes surrounding the site will be indirectly affected to a varying degree depending upon local intervisibility. The apparent scale of the scarp of the Ochil Hills will be reduced by the new structures, when seen from the north, however, the existing masts, pylons and coniferous plantations on the scarp at present already interrupt the natural form of the hills to an extent. The setting back of the turbines away from the scarp edge is beneficial in reducing their visibility, and therefore reduces the potential impact that the turbines may have had on the Ochil Hills.

The operations and control building will be adjacent to the farm at Lochelbank and will not alter the exiting character of the farm, which already includes large barns and machinery storage areas.

4.6

VIEWS

The introduction of these new structures and activity around the site will have impacts upon the quality of views which people experience of this currently rural area. People may find this intrusive or interesting depending on their attitudes to the principle and the presence of wind generation.

Wind farms by their nature and elevated location are often highly visible from a large number of locations all around them and this will be the case here. Views that will be affected include those from residential properties, other buildings including work places, community and recreational buildings, and outdoor locations to which the public have access. Passing travellers, including local people and tourists, will also see the development as a sequence of open or glimpsed views as they drive or walk along routes through the area.

Photomontages from two key viewpoints are included in *Figures 3 and 4*. These give an indication of the visual appearance of the wind farm from a local and a more distant location. Further visualisations are included in the Environmental Statement.

Impacts will be significant from many of the properties which lie close to Lochelbank and along the minor roads and paths which surround the site. They will also be significant from parts of Perth and the Bridge of Earn to the north of the site, the Carse of Gowrie and the Firth of Tay to the north east, the Lomond Hills to the south east, Kinross, Loch Leven and Benarty Hill to the south, parts of the Ochil Hills to the west and Strathearn to the north west. Lochelbank will also be visible in long distance views on clear days from the Trossachs.

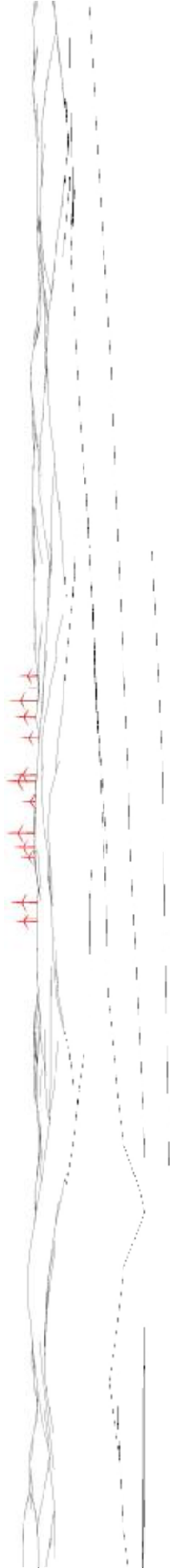
Views from within the Ochil Hills, orientated east – west across the centre of the zone of visual influence of the development, are restricted due to the undulating topography. The northern scarp of these hills creates a visual shadow, screening views from parts of Strathearn to the north, and the crest of the Lomond Hills blocks views from further south east. The Braes of the Carse screen views from the north east.

The detailed siting of turbines will be used to reduce visibility and improve the visual form as far as possible, but the tall structures will still be widely visible and will have significant impacts on a large number of viewers.

4.7

IMPACTS ON ECOLOGY

The development lies adjacent to Pitkeathly Mires, a candidate European Special Area of Conservation and a national Site of Special Scientific Interest (see *Figure 1*). The site will not be directly affected and measures will be taken to prevent incursions into the site and secondary impacts from dust and other



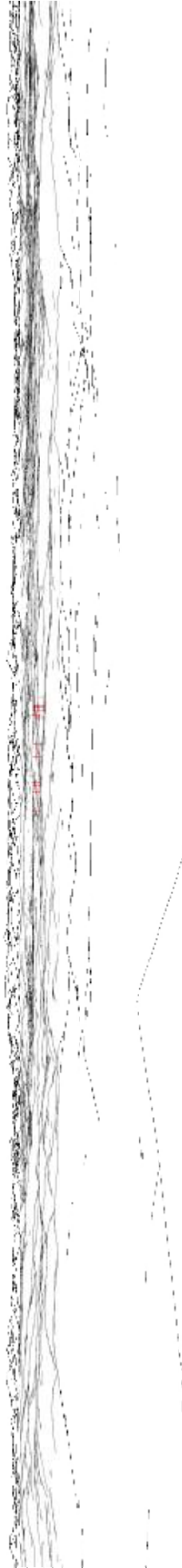
GR: 498100 E, 711520 N
 Distance from site: 4 km
 Direction from site: W
 Elevation: 200 m

Viewpoint 1
Struie Castle (view from west)

For a true representation:
 View print from a distance of approximately 50 cm at A3

Figure 3
Lochelbank Wind Farm





GR: 319710 E, 706640 N
 Distance from site: 10 km
 Direction from site: south
 east
 Elevation: 522 m

Viewpoint 4
 West Lothian (elevated view from south east)

For a true representation:
 View print from a distance of approximately 50 cm at A3

Figure 4
 Lochelbank Wind Farm



pollution. The integrity of the site will remain unaffected and no long term or significant impacts are predicted.

None of the other designated sites will be directly affected. There is the potential for collisions of both pink-footed geese and greylag geese with the turbines. The pink-footed geese recorded are thought to roost to the south east of the wind farm site, possibly in the Loch Leven SPA, with the birds flying to feed in and around the Earn Valley. However, the proportion of birds likely to be affected is very low and significant impacts are not predicted. It is possible that a relatively high proportion of the greylag geese which roost at Glenfarg Reservoir (an SWT Wildlife Site) could be affected, although much of the activity of these geese is influenced by feeding by local landowners at the man-made reservoirs and disturbance during livestock management. NR is seeking to agree alternative arrangements with the landowners to help draw the birds away from the turbines.

The majority of the habitat that will be affected is coniferous plantation (approximately 66 ha), due to the felling of Hill Wood, and improved or poor-semi improved grassland (approximately 2 ha), all of which are common habitat types in the area and of relatively low nature conservation value. Only a very small area of heathland (approximately 0.6 ha) and semi-improved acid grassland (approximately 3.5 ha) will be affected. New areas of acid grassland/heathland will be created on the former site of Hill Wood on completion of the works.

There has been some evidence of otter, water vole, badger and red squirrel activity at Lochelbank or in its immediate surrounds, however, the surveys in 2003/2004 did not record any of these species breeding on the site. Significant impacts upon these species are not therefore expected to occur.

None of the four protected bird species recorded in the area during surveys (whooper swan, red kite, osprey and peregrine) nest on the site, and the majority of the eight Red List species recorded (grey partridge, skylark, song thrush, starling, house sparrow, bullfinch, linnets, and yellowhammer) occur in areas that will not be affected by the proposals.

The proposals will result in the loss of nesting and foraging habitat for some predominantly common bird species, although a few territories of song thrush, skylark (both Red List species) and breeding wader species will be affected.

None of the waterbodies, which regularly support whooper swan and greylag and pink-footed geese, will be directly affected by the proposals, and only one stubble field, which provides foraging habitat, will be affected. The birds' presence at the man made reservoirs in the west of the site is encouraged by artificial feeding by the landowners. NR is seeking to agree alternative arrangements to help draw these birds away from the turbine area.

Construction of the wind farm is likely to result in localised disturbance to birds in the immediate vicinity of the work, which are likely to maintain an

initial stand off distance from the works. Whilst construction will occur over a 12 month period, the work will be progressive and hence the impacts will be short lived in any one area.

Once operational it is likely that some bird species will be displaced by the wind farm and maintain a stand off distance from the turbines. The extent and duration of this effect will depend largely on the species and responses by individual birds. With the exception of a pond in Hill Wood and turbine 11 in the stubble field at the north east of the site, the remaining turbines lie several hundred metres from nesting and feeding areas favoured by wildfowl, raptors and waders.

The number of flights by raptor species of high nature conservation value was low and the majority of flights were recorded at some distance from the turbines. The risk to these species is predicted to be low. A greater risk is likely to be posed to buzzard, however, this is a common and widespread species both locally and nationally.

4.8

ARCHAEOLOGY AND CULTURAL HERITAGE

The layout of the turbines and tracks has been developed, where possible, to avoid known sites of archaeological significance, and as a result impacts on the majority of archaeological sites of interest identified are negligible or minor. In fact, for all of the seventeen sites now within the proposed development footprint, the level of significance of the proposed development is categorised as None or None to Minor.

Cairn Geddes is Scheduled Ancient Monument, and is therefore identified as of high importance. There will be no physical effect on the feature and it lies outwith the proposed development footprint, but because of its high importance and the visual and aural effects on its setting, the resulting indirect impact is evaluated as "Major".

The proposed development will not have any direct physical impact on any Scheduled Ancient Monuments (SAMs), Listed Buildings, Conservation Areas or Designed Landscapes, however indirect impacts on their setting and character may result from visual intrusion. In the wider area the settings of a Scheduled Ancient Monument at Castle Law Hill Fort about 1½km to the north, and one nearby B-listed building at Fordel about 650m to the southwest, will be significantly affected.

The known history of the area suggests that it is possible that further finds could be encountered during construction and for this reason an archaeological watching brief will be maintained during construction and arrangements made with Historic Scotland and Perth & Kinross Council to deal with any finds by investigation, excavation or recording as appropriate.

4.9

NOISE

Noise from the wind farm was modelled under various conditions in accordance with the guidance given in the "Assessment and Rating of Noise from Wind Turbines" (DTI Noise Working Group). The results of the assessment indicate that levels will be below accepted thresholds at all residential locations around the site.

The thresholds have been developed by the DTI facilitated Noise Working Group on Wind Turbine Noise and adopted in Scottish planning guidance. It can therefore be concluded that there will be no significant impacts on residential receptors as a result of operation of the wind farm. Operational noise may however be audible to walkers in the immediate area of the wind farm.

There will be noise during construction, principally during quarrying and construction of tracks. Construction will be sufficiently distant from dwellings to avoid noise impacts on residents although there will be short term disturbance for walkers in the general vicinity.

4.10

TRAFFIC AND TRANSPORT

Construction of the wind farm will require a peak of about 20 lorry movements per day. These movements will be noticeable in terms of traffic flow on the local road network near to the site but will be insignificant on the main roads further away (the M90, A91 and B966). Construction traffic will have no adverse effects on other road users. Junctions between the A91 and B966 and certain sections of the Wicks o' Baiglie Road may need to be widened to accommodate construction vehicles and these works will be undertaken in agreement with the Roads Authority. Construction traffic levels will be insufficient to cause significant environmental impacts for residents of roads used to access the site.

A substantial number of abnormal loads will need to be delivered to the site. These will be scheduled and arranged with the police to minimise disruption to other road users.

Traffic movements during operation will be limited to approximately four light vehicle movements per week during routine operations and maintenance activities. There will be servicing visits approximately every six months. No long term significant impacts from these traffic movements are predicted.

4.11

GREENHOUSE GAS AND OTHER EMISSIONS

Wind energy offers the potential for reduction in emissions of greenhouse gases and other air pollutants by replacing other forms of power generation. The reductions in carbon dioxide, sulphur dioxide and nitrogen oxides emissions as a result of operating a 16MW wind farm were estimated, based

on the output from the wind farm directly replacing production from coal-fired power stations. The reduction in CO₂ emissions from Lochelbank Wind Farm equates to approximately 0.2% of the total CO₂ emissions from the Scottish Energy Industry in 2001 (21.9 million tonnes).

There should be no significant sources of emissions from operation of the wind farm but there will be localised emissions during construction mainly of dust from quarrying, earthworks and materials handling. Good practice measures will be adopted at the construction site to control the generation and dispersion of dust and significant impacts on neighbouring habitats and property are not predicted to occur.

4.12 *INTERFERENCE*

Wind turbines can cause interference in television and microwave signals affecting domestic television and radio reception and air traffic control systems. Contact has been made with all relevant authorities and no concerns were identified with regard to the proposals at Lochelbank

There is some risk of interference with television reception where users rely upon out of area transmitters but the Independent Television Commission do not anticipate problems to be widespread and note that it is possible to overcome any instances where television reception is disrupted. If any problems arise NR will make appropriate arrangements to ensure reception is adequately maintained.

The MoD and relevant Air Traffic Services have not objected to the proposals and will be advised when wind farm construction is planned to start.

4.13 *SHADOW FLICKER*

In certain specific conditions wind turbines can cause what is referred to as 'shadow flicker'. This is an effect perceived through windows when low sun shines through moving turbine blades into property. There are no properties near Lochelbank in positions that could be subject to this effect.

4.14 *EMPLOYMENT AND ECONOMIC ACTIVITY/SOCIO-ECONOMIC EFFECTS*

The construction and operation of the proposed Lochelbank Wind Farm has the potential for beneficial impacts on the local economy through employment, community investment, tourism and other direct benefits to local services.

The construction cost of Lochelbank Wind Farm is estimated to be about £10 million. There will be considerable opportunities for local economic benefit through employment during construction and expenditure on supporting goods and services that can be supplied by local and regional businesses.

The predicted ongoing annual expenditure associated with the Lochelbank project is £150,000, most of which would be associated with maintenance and repairs. Some of this activity may be successfully tendered for by local contractors and associated work for sub-contractors would also be expected to generate knock-on employment in the local economy.

As part of the company's 'good neighbour' policy, it is NR's practice to establish local community funds at each of its operating wind farms, in consultation with local councillors. This approach will apply at Lochelbank. Funds are typically provided to local community councils and may be used to assist with community facilities such as local schools, sports clubs, youth clubs and other projects. In addition to local community fund payments, NR will be liable for local business rates.

4.15 *CUMULATIVE IMPACTS*

An Environmental Statement is required to consider the potential for cumulative impacts of the proposed project together with other developments in the area. There is one consented wind farm within 60km of Lochelbank and there are fourteen other wind farms in planning, with which it could have cumulative impacts. None are sufficiently close to cause cumulative noise impacts or cumulative impacts on any land based environmental resources or property. The principal concern is therefore their cumulative landscape and visual impact.

Cumulative visual impacts were investigated by identifying cumulative zones of visual influence and preparing illustrations from key locations. It is evident from these that there are substantial areas over which Lochelbank will be visible at the same time as one or more other wind farms. These cumulative impacts are often of the successive or sequential type where the viewer has to either turn on the spot or move along a route (a road or path) to see more than one wind farm. There are, however considerable areas over which two wind farms will be visible without turning or moving, including the summits of hills around the site, and the areas of Strathearn and around the A9 and the A85, where Lochelbank will be visible, most frequently with Knowehead.

Sequential views will be available from various roads and paths, with the greatest effect on the A9 and the Kingdom Cycle route. On the A9 there are numerous locations where Lochelbank and one or two other wind farms will be seen at the same time.

COMMENTING ON THE ENVIRONMENTAL STATEMENT AND NON TECHNICAL SUMMARY

A principal purpose of environmental impact assessment is to provide interested parties with an opportunity to comment on the proposals before a decision is made on grant of consent.

The Environmental Statement and this Non Technical Summary are therefore available to view at post offices in Glenfarg and Bridge of Earn, and the AK Bell Library, Perth. Alternatively copies can be obtained from NR ⁽¹⁾ or ERM ⁽²⁾. An electronic version is also available on CD.

The ES is illustrated with a number of figures and photographs which are reproduced at A4 size in the main document and are presented within or at the end of each chapter as appropriate. Higher quality reproductions of these are also available in an accompanying A3 report (Supplementary Volume: Illustrations) which can be made available on request.

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(2) ERM, Norloch House, 36, King's Stables Road, Edinburgh, EH1 2EU. Email Fiona.Hamilton@erm.com. Tel 0131 478 6000).

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