AGENDA ITEM NO 4

REPORT NO 115/15

ANGUS COUNCIL

DEVELOPMENT MANAGEMENT REVIEW COMMITTEE –26 FEBRUARY 2015

FIELD 200M NORTH EAST OF BALNACAKE FARM, ALDBAR, BRECHIN

REPORT BY THE HEAD OF LEGAL AND DEMOCRATIC SERVICES

ABSTRACT:

The Committee is asked to consider an application for a Review of the decision taken by the Planning Authority in respect of the refusal of planning permission for the erection of a wind turbine and ancillary development, application no 14/00281/FULL at Field 200M North East of Balnacake Farm, Aldbar, Brechin.

1. RECOMMENDATIONS

It is recommended that the Committee:-

(i) review the case submitted by the Planning Authority (**Appendix 1**); and

(ii) review the case submitted by the Applicant (**Appendix 2**).

2. ALIGNMENT TO THE ANGUS COMMUNITY PLAN/SINGLE OUTCOME AGREEMENT/CORPORATE PLAN

This Report contributes to the following local outcomes contained within the Angus Community Plan and Single Outcome Agreement 2013-2016:

- Our communities are developed in a sustainable manner
- Our natural and built environment is protected and enjoyed

3. CURRENT POSITION

The Development Management Review Committee is required to determine if they have sufficient information from the Applicant and the Planning Authority to review the case. Members were provided with the application for review on 13 February 2015 and subsequently agreed to undertake a site visit on 26 February 2015 before full consideration of the Appeal.

4. FINANCIAL IMPLICATIONS

There are no financial implications arising directly from the recommendations in the Report.

5. CONSULTATION

In accordance with Standing Order 47(3), this Report falls within an approved category that has been confirmed as exempt from the consultation process.

NOTE: No background papers, as defined by Section 50D of the Local Government (Scotland) Act 1973, (other than any containing confidential or exempt information) were relied on to any material extent in preparing the above Report.

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List of Appendices:

Appendix 1 – Submission by Planning Authority
Appendix 2 – Submission by Applicant

APPENDIX 1

APPLICATION NUMBER - 14/00281/FULL
APPLICANT: POLAR ENERGY (NETHERTON) LTD FOR ERECTION OF WIND TURBINE OF 40 METRES TO HUB HEIGHT AND 67 METRES TO BLADE TIP AND ANCILLARY DEVELOPMENT

ANGUS COUNCIL'S SUBMISSION

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Angus Council

Application Number:	14/00281/FULL
Description of Development:	Erection of wind turbine of 40 metres to hub height and 67 metres to blade tip and ancillary development
Site Address:	Field 200M North East Of Balnacake Farm Aldbar Brechin
Grid Ref:	355652 : 757650
Applicant Name:	Polar Energy (Netherton) Ltd.

Report of Handling

Site Description

The site is located approximately 4.5km south west of Brechin, on arable farmland to the east of Balnacake Farm. The site lies uphill of and to the south of the B9134 between Forfar and Brechin. The site sits close to the top of the escarpment of a ridge which runs from Carse Hill (east of Forfar) towards Middle Drums (south of Brechin) and contains the summits of Carse Hill, Hill of Finavon, Grave Hill and Angus Hill. The ridge is a prominent landscape feature from Strathmore. The site sits within the Landscape Character Type (LCT) of Low Moorland Hills.

Proposal

The proposal is for the erection of a wind turbine which would be 40m to hub height and 67 metres to blade tip with associated development. The turbine design involves a three bladed rotor located atop a monopole design. The associated development proposed includes a new and improved 4m wide access track and a crane hardstanding at the foot of the proposed turbine. Improvements to the access to the site are sought including a widened bellmouth junction where the site access track meets with the B9134.

The application has been screened in the context of the Environmental Impact Assessment (Scotland) Regulations 2011 which concludes that the development is not an EIA development and a negative screening opinion is included within the file.

The application has not been subject of variation.

Publicity

The nature of the proposal did not require the application be the subject of Neighbour Notification.

The application was advertised in the Dundee Courier on 25 April 2014 for the following reasons:

- Schedule 3 Development

The nature of the proposal did not require a site notice to be posted.

Planning History

13/00730/EIASCR for Wind Turbine Development Comprising One Wind Turbine of 67 metres to Blade Tip was determined as "EIA NOT Required" on 8 May 2014.

Application 12/00779/FULL Proposed the Installation of Three Turbowind T400 400kW Wind Turbines (hub height 34m, tip height 51m) at Field 200M North East Of Balnacake Farm, Aldbar, Brechin. This

application was withdrawn.

Applicant's Case

As part of the application an Environmental Appraisal (April 2014) was submitted which includes information relating to the wind turbine specification, photomontages of the proposed turbine and noise information. This document explains the proposal including the associated development proposed to facilitate the construction and operation of a wind turbine on the site. It provides a policy and guidance context for the consideration of a wind turbine proposal in this landscape character type. The document concludes that noise for the proposed development is not considered to be significant with no negative impacts associated with the operation of the proposed turbine. The landscape and visual assessment provided concludes that the location of the turbine has the ability to accommodate it with a reasonable effect on the wider landscape and visual resource.

The applicant has also submitted a response to the comments received form the Natural & Built Environment – Landscape Team. These comments indicate that 'although the proposed turbine lies close to the escarpment slopes that define the northern edge of the Low Moorland Hills LCA at Montreatmont Moor, the Netherton turbine has been set back and sensitively scaled, to restrict clear visibility from the nearest sensitive areas. It is therefore in line with the key determining issues defined in the current SLCA guidance for avoiding domination of the landscape character and of views from residential properties. Although some effects are anticipated, they are fairly localised and they are not considered to result in an unacceptable level of change on the wider landscape and visual resource.'

The applicant subsequently submitted figures regarding cumulative effects between the proposed turbine and the East Drums site and suggests that the combined effects would be 'fairly limited'.

Consultations

NERL Safeguarding - No safeguarding objections

Ministry Of Defence - No objections but requested a standard condition regarding notification be attached and aviation lighting should be attached

Dundee Airport Ltd - No objections

Scottish Natural Heritage - Referred to standard guidance. No additional comments.

Angus Council Environmental Health - No objections subject to conditions

Civil Aviation Authority - No objections

RSPB Scotland - No specific concerns but highlighted the increasing number of turbine proposals in this general area.

Spectrum - Not raised any objections

Atkins - No objections

Joint Radio Co Ltd - Does not foresee any potential issues

Aberdeenshire Council Archaeology Service - No archaeological mitigation required

Historic Scotland - Archaeology - No comments

Community Council - There was no response from this consultee at the time of report preparation.

Angus Council - Roads - No objections subject to conditions

Scottish Water - There was no response from this consultee at the time of report preparation.

Representations

There were no letters of representation.

Development Plan Policies

Angus Local Plan Review 2009

Policy S1 : Development Boundaries
Policy S3 : Design Quality
Policy S6 : Development Principles (Schedule 1)
Policy ER4 : Wider Natural Heritage and Biodiversity
Policy ER5 : Conservation of Landscape Character
Policy ER34 : Renewable Energy Developments
Policy ER35 : Wind Energy Developments
Policy ER11 : Noise Pollution
Policy ER16 : Development Affecting the Setting of a Listed Building
Policy ER18 : Archaeological Sites of National Importance
Policy ER19 : Archaeological Sites of Local Importance

TAYplan Strategic Development plan

The proposal is not of strategic significance and policies of TAYplan are not referred to in this report.

Other Guidance

Angus Council Renewable Energy Implementation Guide (2012)
Strategic Landscape Capacity Assessment For Wind Energy In Angus (2014)

The full text of the relevant development plan policies can be viewed at Appendix 1 to this report.

Assessment

Sections 25 and 37(2) of the Town and Country Planning (Scotland) Act 1997 require that planning decisions be made in accordance with the development plan unless material considerations indicate otherwise.

In addition to the development plan a number of matters are also relevant to the consideration of the application and these include: -

- National Planning Framework for Scotland 3 (NPF3);
- Scottish Planning Policy (SPP);
- Scottish Government 'Specific Advice Sheet' on Onshore Wind Turbines;
- Tayside Landscape Character Assessment;
- Angus Council Implementation Guide for Renewable Energy Proposals (2012);
- Strategic Landscape Capacity Assessment for Wind Energy in Angus (Ironside Farrar - 2013);
- Angus Wind farms Landscape Capacity and Cumulative Impacts Study (Ironside Farrar, 2008);
- Siting and Design of Small Scale Wind Turbines of Between 15 and 50 metres in height (SNH, March 2012);
- 'Assessing The Cumulative Impact of Onshore Wind Energy Developments' (SNH, March 2012)
- Planning Advice Note 1/2011: Planning and Noise.

NPF3 states that the Government is committed to a Low Carbon Scotland and through the priorities identified in the spatial strategy set a clear direction to tackling climate change through national planning policy. Renewable energy technologies, including onshore wind, are identified as key aspects to realising this aim whilst recognising that a planned approach to development is required to find the correct balance between safeguarding assets which are irreplaceable while facilitating change in a sustainable way.

The Scottish Planning Policy (SPP, June 2014) represents a statement of government policy on land use planning. In relation to onshore wind, the SPP states that 'Planning authorities should set out in the development plan a spatial framework identifying area that are likely to be most appropriate for onshore wind farms… The spatial framework is complemented by a more detailed and exacting development management process where the merits of an individual proposal will be carefully considered against the full range of environmental, community and cumulative impacts… proposals for onshore wind should continue to be determined while spatial frameworks are and local policies are being prepared and updated'. Proposals for energy infrastructure developments should always take account of spatial frameworks for wind farms and heat maps where these are relevant. Considerations will vary relative to the scale of the proposal and area characteristics but are likely to include:

- net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities;
- the scale of contribution to renewable energy generation targets;
- effect on greenhouse gas emissions;
- cumulative impacts - planning authorities should be clear about likely cumulative impacts arising from all of the considerations below, recognising that in some areas the cumulative impact of existing and consented energy development may limit the capacity for further development;
- impacts on communities and individual dwellings, including visual impact, residential amenity, noise and shadow flicker;
- landscape and visual impacts, including effects on wild land;
- effects on the natural heritage, including birds;
- impacts on carbon rich soils, using the carbon calculator;
- public access, including impact on long distance walking and cycling routes and scenic routes identified in the NPF;
- impacts on the historic environment, including scheduled monuments, listed buildings and their settings;
- impacts on tourism and recreation;
- impacts on aviation and defence interests and seismological recording;
- impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised;
- impacts on road traffic;
- impacts on adjacent trunk roads;
- effects on hydrology, the water environment and flood risk;
- the need for conditions relating to the decommissioning of developments, including ancillary infrastructure, and site restoration;
- opportunities for energy storage; and
- the need for a robust planning obligation to ensure that operators achieve site restoration.

The Scottish Government's Planning Advice Notes relating to renewable energy have been replaced by Specific Advice Sheets (SAS). The 'Onshore Wind Turbines SAS' identifies typical planning considerations in determining planning applications for onshore wind turbines. The considerations identified in the SAS are similar to those identified by policies ER34 and ER35 of the ALPR and the SPP as detailed above.

Angus Council has produced an Implementation Guide for Renewable Energy Proposals. It provides guidance for development proposals ranging from small single turbines to major windfarms. It indicates that wind developments are the primary area of renewable energy proposals in Angus and the planning considerations are strongly influenced by the scale and location of the proposal including landscape and visual impact, potential adverse effects on designated natural and built heritage sites, protected species, residential amenity, soils, water bodies and access.

Scottish Natural Heritage in conjunction with Angus and Aberdeenshire Councils commissioned Ironside Farrar to review current landscape sensitivity and capacity guidance in relation to wind energy development. The Strategic Landscape Capacity Assessment for Wind Energy in Angus (March 2014) provides updated information on landscape capacity for wind energy development and the potential cumulative impact of proposals in the context of operational and consented developments.

Proposals for wind turbine developments and associated infrastructure are primarily assessed against policies ER34 and ER35 of the ALPR although other policies within the plan are also relevant. The policy position provides a presumption in favour of renewable energy developments recognising the contribution wind energy can make in generating renewable energy in Scotland. These policies also require consideration of impacts on ecology including birds; cultural heritage including listed buildings, scheduled monuments, designed landscapes and archaeology; aviation; amenity in the context of shadow flicker, noise and reflected light; landscape and visual impact including cumulative impacts; future site restoration; transmitting or receiving systems; any associated works including transmissions lines, road and traffic access/safety and the environmental impact of this. These policy tests overlap matters contained in other policies and therefore these matters are discussed on a topic by topic basis.

Environmental and Economic Benefits

The local plan indicates that Angus Council supports the principle of developing sources of renewable energy in appropriate locations. The SPP sets out a "commitment to increase the amount of electricity generated from renewable sources" and includes a target for the equivalent of 100% of Scotland's electricity demand to be generated from renewable sources by 2020 along with a target of 30% of overall energy demand from renewable sources by 2020. Paragraph 154 of the SPP indicates that planning authorities should help to reduce emissions and energy use in new buildings and from new infrastructure by enabling development at appropriate locations that contributes to electricity and heat from renewable sources.

The proposed wind turbine would offset the emissions of CO2 involved in producing electricity using fossil fuels. It is accepted that the proposed turbine could make a contribution towards renewable energy generation and as such the proposal attracts in principle support from the local plan. I have had regard to that contribution in undertaking my assessment of the proposal. To assess the acceptability of the proposals in terms of the more detailed technical issues, the policy tests must be explored.

Landscape Impact

Local Plan Policy ER5 (Conservation of Landscape Character) requires development proposals to take account of the guidance provided by the Tayside Landscape Character Assessment (TLCA), prepared for Scottish Natural Heritage (SNH) in 1999, and indicates that, where appropriate, sites selected should be capable of absorbing the proposed development to ensure that it fits into the landscape. Policy ER34 of the local plan indicates that proposals for renewable energy development will be assessed on the basis of no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints.

The proposed site is within the Landscape Character Type (LCT) of Low Moorland Hills (TAY12) within the Tayside Landscape Character Assessment (TLCA). The landscape character area is characterised by gently undulating farmland of a medium to large scale which is gently sloping towards the north-east and the Lowland Basin LCA. The north western edge is marked by a steep escarpment towards the valley of the South-Esk River. The large mature lowland forest of Montreathmont, which is dominated by coniferous planting, is a characteristic element of the northern part of the LCA whereas the southern part is characterised by the Forfar hills and their Hill forts.

The Renewable Energy Implementation Guide (2012) provides information regarding of the level of turbine development that a LCT is capable of absorbing. The Implementation Guide indicates that an acceptable level of change for Low Moorland Hills would be defined as a Landscape with Occasional Windfarms, with a capacity for turbines of circa 80m in height which do not disrupt the principle ridgelines or adversely affect

the setting of important landscape features and monuments such as Balmashanner Monument; and Finavon and Turin hillforts. The Strategic Landscape Capacity Study for Wind Energy in Angus (2014) further refines that assessment of capacity. It subdivides the Low Moorland Hills into two landscape character areas: the Forfar Hills to the south west of the LCT and Montreathmont Moor to the north east. The analysis of the Montreathmont Moor area is that it generally has capacity to accommodate large (up to 80m) turbines, but cautions to avoid locating medium/large turbines close to the escarpment slope above Strathmore because the turbines would dominate the modest scale of the landform.

The site is located on a prominent ridge which runs from east of Forfar to South of Brechin. The land level to the north of the application site drops significantly towards the River South Esk (Broad Valley Lowland LCT) resulting in an escarpment which is prominent from the A90/Strathmore corridor between Forfar and Brechin. Around the site the landscape feels open and exposed, with distant views opening over the Broad Valley Lowland to the north-west. The proposed turbine would be located at the summit of a small hill which forms part of the steep escarpment between the Low Moorland Hills and the South Esk River valley. The 67m turbine would be located in an exposed location above the River South Esk valley and the Broad Valley Lowland. The landscape character of the location of the site is generally considered an area with no capacity for turbines of this size. Although the Montreathmont Moor area is generally considered to have the capacity to accommodate medium-large and large turbines, the escarpment towards the South Esk River valley is not considered to have a capacity for turbines of this size. The location of the medium/large turbine close to the escarpment over the river South Esk valley would dominate this small scale landform and the skyline of the Low Moorland Hills.

The escarpment is one of the most sensitive areas within the LCT. The Renewable Energy Implementation Guide indicates that turbine should not disrupt principal ridgelines and the Strategic Landscape Capacity Assessment for Wind Energy explicitly seeks to avoid locating medium to large turbines close to the escarpment slope above Strathmore. The combination of the proposed location and height of the turbine would result in significant adverse impacts on the landscape. On the basis of the above it is considered that landscape impacts are unacceptable in terms of polices ER34 and ER35.

Visual Impact

Policy S6 of the Angus Local Plan Review requires that proposals should not give rise to unacceptable visual impact. Policy ER34 of the Local Plan also indicates that renewable energy development will be assessed on the basis of no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints. In assessing visual impact I consider that it is appropriate to have regard to recent appeal decisions within Angus where this issue has been considered in order to secure a degree of consistency in the decision making process.

Planning appeal decisions have generally accepted that residents should be treated as of high sensitivity in assessing the significance of visual impact. The magnitude of change (and, thus, the significance of the impact they will experience) will vary with the context of the house that they occupy: its distance from the proposed wind turbine and orientation in relation to it; the presence of intervening screening from vegetation and other buildings; and the presence of other significant visual features. However it is not only the views from principal rooms that are of importance as residents also use the space around their house and the impact on occupiers and visitors approaching or leaving the properties must also be considered.

The proposal is supported by a ZTV which suggests that the hub of the turbine would be theoretically visible over a relatively large area encompassing Brechin, Montrose, the public road between Montreathmont Forest and Montrose, the A90(T) between Finavon and Trinity, parts of eastern Kirriemuir and rural areas along Strathmore and to the north of Arbroath. The site is located on a hill which forms the edge of the escarpment separating the Low Moorland Hill with the Broad Valley Lowlands. Within the Low Moorland Hills area the main visual receptors with a close vicinity of this turbine would be minor roads, scattered dwellings and (at a further distance) Turin Hill. Within the Broad Valley Lowland there are more frequented roads such as the Forfar - Brechin B9134 road and the A90(T) and it is considered that the proposed turbine would be clearly visible from sections along these roads. There is also a high concentration of properties

which would be visual receptors of the proposed turbine, such as small settlements within the South Esk Valley and the town of Brechin.

Views from within the Low Moorland Hills area vary between the more contained and the more exposed areas within the undulating topography. Having visited the site and reviewed all of the supporting information it is considered that in distant views over the Broad Valley Lowlands the turbine would be a prominent feature in the foreground. It would be a prominent feature in the landscape when viewed from sections of the minor roads to the south-east. The prominent nature of the turbine can be seen in viewpoint 1 (VP 1) within the photomontages submitted by as part of the application.

From within the Broad Valley Lowland the turbine would be a prominent feature against the skyline on the horizon and it is considered that a good representation of the visual effects in most places would be comparable to those represented in viewpoint 3, albeit without the screening of the woodland (as shown in the associated wireline). From the edge of Brechin the turbine would be prominent on the southern skyline and would impact on the wider landscape character. This is represented in viewpoint 4.

In terms of residential properties there are a number of properties located within 2km of the proposed turbine. Properties which are in relatively close proximity to the turbine are at Balnacake at approximately 430m to the west, Broomknowe Cottages at 550m to the north-east, Wandershiell at 560m to the south, Walkend Cottage at 730m to the east, and House View House at 820m to the south.

The closest property to the turbine at Balnacake is located approximately 430m to the south west of the turbine. The existing house is not orientated directly towards the turbine and with existing agricultural sheds and trees surrounding the property there will be a degree of screening form the turbine. However at such a close distance the turbine would still be a significant feature from the amenity areas around the property and on approach to it. The existing property at Wandersheild is orientated south, away from the turbine and has a large amount of mature trees enclosing the property, with a large barn facing the turbine on the hill behind the property. Due to the size of the proposed turbine it is expected to have some significant visual impacts on the amenity of the property at Wandersheild. However as the property appears to have a degree of screening in the direction of the turbine this would help reduce any visual impacts. The property of House View is located at a distance of 820m further to the south east from Wandershield and also faces south. Whilst the property would experience some impacts, the turbine height compared to distance from the property ratio would be such that these visual impacts would possibly only be classed as moderate to significant. The turbine would be unlikely to be a dominant focal point in the foreground of this property.

The property of Broomknowe (at a distance of 550m) would possibly experience views of a large rotor of the turbine from the rear of the property and from amenity space associated with the property. The turbine would possibly appear dominant in size similar to the illustration of VP9. However it is noted that the property is not orientated directly towards the turbine. It is noted that the turbine is likely to be visible in the area around Melgund Castle, where there are scenic landscape views over the Broad Valley Lowlands. The turbine would also be likely to be visible from the settlement of Aberlemno and the Crosston Standing Stones.

Local plan policy requires proposals to demonstrate that the siting and appearance of the apparatus has been chosen to minimise the impact on amenity, and that there would be no unacceptable adverse visual impacts. For views from within Strathmore, from Brechin and views from within the Low Moorland Hills the turbine would create a dominant visual focus with strong skyline effects and no back-clothing. The turbine would adversely affect several scenic landscape views over the South Esk River Valley from within the less frequented area of the Low Moorland Hills, and also skyline views of the Low Moorland Hills from receptors at further distances such as Brechin, with a high number of residents that would be exposed to these views of the turbine. In this case it is considered that the proposal would give rise to significant visual impacts on the wider area and I consider that these impacts are unacceptable and contrary to policies S6 and ER34.

Cumulative Landscape and Visual :

An assessment of cumulative landscape and visual effects is also required by local and national policy.

SNH Guidance on 'Assessing The Cumulative Impact of Onshore Wind Energy Developments' (March 2012) indicates that cumulative landscape effects can include effects on the physical aspects of the landscape and effects on landscape character. Cumulative visual effects can be caused by combined visibility and/or sequential effects. Combined visibility may be in combination i.e. where several wind farms are in the observers arc of vision or in succession where the observer has to turn to see various wind farms. Sequential effects occur when the observer has to move to another viewpoint to see different developments.

The Renewable Energy Implementation Guide (2012) provides interpretation of the level of turbine development that a LCT is capable of absorbing in cumulative terms. As an acceptable level of change of landscape character the future Wind Energy Landscape Type for this area has been defined as a 'Landscape with Occasional Windfarms'. This is refined and updated by the Strategic Capacity Study for Wind Energy in Angus (2014) which indicates that the Montreathmont Moor LCA is considered to have a low underlying capacity for medium-large (50-<80m) turbines and a low remaining capacity for medium/large turbines. It indicates that medium-large turbines should ideally be spaced between 5 and 10km and not exceed group numbers of 3 turbines. It states that medium (30-<50m) turbines should ideally be spaced 3-6km apart from other medium turbines.

At present there is little wind energy development in the area and within the range of 5km there is one operational small-medium sized turbine of 20m tip-height at 3.1km at Melgund Muir. There are two pending applications for turbine developments within the range of 5km, one medium-large sized turbine of 67m tip-height at 3.9km to the east at East Drums Brechin and one medium-sized turbine of 45.9m tip-height at Bellahill Melgund at 4.1km to the south-west. Relevantly sized turbines approved within the range of 7km are the medium-large sized 77m tip-height turbine at 5.5km to the south at Pickerton Guthrie, the medium-large sized 77m tip-height turbine at 6km to the north-west at Dunswood Menmuir Brechin.

It is considered that significant cumulative landscape or visual impacts arising from the proposed scheme in combination with any of the approved or operational turbines would be unlikely. It is noted that there is a current application for a medium-large sized turbine at East Drums, Brechin (app ref: 14/00110/FULL) which is located 3.9km to the east of the application site and that this could give rise to cumulative visual impacts in combination with this proposal. However the application at East Drums is still pending at the time of writing this report and any decision on that application would take account of the decision on this application.

Amenity (Noise/Shadow Flicker/Reflected Light)

Criterion (a) of Policy ER34 requires the siting and appearance of renewable energy apparatus to be chosen to minimise its impact on amenity, while respecting operational efficiency. Policy ER35(c) indicates wind energy developments must have no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light. Policy S6 Schedule 1 also refers to amenity impacts whilst Policy ER11 deals specifically with noise pollution.

The supporting information submitted suggests that noise impacts would not be unacceptable. It provides information on how the site would be accessed from the public road by improving and extending the existing farm access to Balnacake to the west. The Environmental Health and Roads Services have raised no concerns regarding noise, shadow flicker, reflected light or road safety impacts. On this basis it is not considered that there would be any unacceptable amenity impacts that cannot be satisfactorily addressed by planning conditions.

Impact on Natural Heritage

The Angus Local Plan Review contains a number of policies that seek to protect important species and sites designated for their natural heritage interest and to ensure that proposals that may affect them are properly assessed. It also indicates that the Local Biodiversity Action Plans will constitute material considerations in determining development proposals. Policy ER35 specifically requires that proposals should demonstrate that there is no unacceptable interference to birds.

The 'Onshore Wind Turbines SAS' indicates wind turbine developments have the capacity to have both positive and negative effects on the wildlife, habitats, ecosystems and biodiversity of an area. There is also the potential for negative environmental effects, with possible loss of or damage to valuable habitat resulting from construction of turbine bases, access tracks or other works. Such impacts can be significant particularly if they relate to habitats that are difficult to replicate. There is also the potential of collision risk, displacement or disturbance by forcing birds or bats to alter flight paths. Wind farms should not adversely affect the integrity of designated sites protected under EU and UK legislation (Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs)) or wider conservation interests. Planning guidance produced by Scottish Natural Heritage (SNH) indicates that experience suggests that many bird species and their habitats are unaffected by wind turbine developments and the impact of an appropriately designed and located wind farm on the local bird life should, in many cases, be minimal.

In this instance SNH and the RSPB have been consulted. The RSPB have indicated no specific concerns but highlighted the increasing number of turbine proposals in this general area. SNH have not raised any objections. I have no reason to consider that the proposal would result in unacceptable impacts on sites or species and the proposal is considered to comply with Policy ER35 in this regard.

Cultural Heritage

The development plan provides a number of policies that seek to safeguard cultural heritage. These include policies ER16, ER18 and ER19 of the Angus Local Plan Review. Policy ER34 requires proposals for renewable energy development to have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons.

There are a number of Scheduled Ancient Monuments located within close proximity of the turbine. These are known as 'enclosure 200m west of Broomknowe' (at a distance of 730m), 'enclosure 150m SSE of Netherton' (at a distance of 1.3km) and 'settlement 500m south of Netherton' (at a distance of 1.45km). However, Historic Scotland have not raised ay concerns and given the nature of the monuments designations and their location it is not considered that this turbine would have any significant adverse impacts on these monuments.

Kintrockat House which is a Category A listed property is located to the north east of the proposal at a distance of over 1.6km and Melgund Castle which is also a Category A Listed property is located at a distance of over 2.2km to the west. The impact on the setting of listed buildings has been considered both individually and cumulatively with other turbines. However at this distance the turbine would have minimal impact on the setting of listed buildings and the impacts are not considered to be unacceptable.

In terms of other listed buildings there is a grouping of listed buildings to the east / north east which consist of Auldbar School and Gates (B Listed), Auldbar Castle (B Listed), Auldbar Bridge (C Listed) and Auldbar West Lodge (C Listed). However given the distance from the turbine of these properties (between 1.2km and 1.5km) it is not considered that the proposal would have any significant impacts on these surrounding listed buildings.

Historic Scotland has considered the proposal and has offered no comments in respect of impacts on interests within its remit. Aberdeenshire Council's Archaeological Service has indicated that no archaeological mitigation would be required. The potential impact of the development on the setting of the aforementioned A listed buildings has been considered and it is considered that this height of turbine at this distance would not have any unacceptable impact on these features.

Overall it is considered that the proposed development would not give rise to unacceptable impacts in terms of any cultural heritage interests.

Remaining Issues / Other Development Plan Considerations

The remaining policy tests cover the impact of transmission lines associated with energy generation developments; impacts on transmitting or receiving systems; impact of transporting equipment via road network and associated environmental impacts; impact on authorised aircraft activity; and arrangements for site restoration.

The supporting statement indicates that power from the turbine will be transmitted along an underground electricity cable which is shown on the location plan. I consider that a buried cable would have negligible impact in this area given the cultivated nature of the surrounding land. With regards to impacts on TV and other broadcast reception it is recognised that wind turbine development can give rise to interference. However it is generally accepted that digital signals are more robust to such disruption than the previous analogue system. In this case technical consultees have not raised any concern and this matter could have been addressed by planning condition.

In terms of access and road safety the applicant proposes to create an extension to an existing access track and the Roads Service has considered the application and has no objections. In relation to impacts on aircraft activity the MOD, NATS, CAA and Dundee Airport have not objected to the application. On this basis I am satisfied that the proposal is unlikely to give rise to any significant impacts on authorised aircraft activity. The supporting information (Wind Turbine General Specification) indicates that the design lifetime would be 20 - 25 years. A planning condition could secure removal of the apparatus and restoration of the site after this period had the application been approved.

Other Material Considerations

Scottish Government policy supports the provision of renewable energy development including wind farms. The SPP confirms that planning authorities should support the development of wind farms in locations where amongst other matters the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed. The SPP also indicates that areas identified for wind farms should be suitable for use in perpetuity. Consents may be time-limited but wind farms should nevertheless be sited and designed to ensure impacts are minimised and to protect an acceptable level of amenity for adjacent communities. In this case it is accepted that the wind turbine would contribute to meeting government targets and in this regard attracts some support from national policy and from the development plan.

Conclusion

While it is accepted that the wind turbine would contribute to meeting government targets and in this regard attracts some support from national policy and from the development plan; that support is not unqualified by detailed planning considerations including landscape and visual impacts. As discussed above it is considered that this proposal would result in significant adverse landscape and visual impacts in the surrounding area. Whilst wind turbines are necessary to meet government energy targets and it is accepted that this is a location where the technology could operate, it is not considered that the environmental impacts have been or could be satisfactorily addressed by this scale of turbine in this location. Accordingly it is not considered that the proposal receives unqualified support from the SPP.

Development plan policy requires proposals not to have an unacceptable adverse landscape and visual impact having regard to landscape character, setting within immediate and wider landscape, and sensitive viewpoints. Due to the exposed location of the site and it close vicinity to the escarpment slope above the River South Esk Valley, both landscape and visual effects of the development would be significant and adverse. It is considered that the scale of the proposed development would have adverse effects on the landforms of the Low Moorland Hills and their northern escarpment. Although large areas of the Low Moorland Hills could accommodate large to medium-large turbines, the escarpment is one of the most sensitive areas within the LCA and this sensitivity clearly cautioned in the Strategic Landscape Capacity Assessment for Wind Energy in Angus (2014).

When viewed form the wider landscape the turbine would create a dominant visual focus with strong skyline effects and no back-clothing. The turbine would adversely affect several scenic landscape views over the South Esk River Valley from within the less frequented area of the Low Moorland Hills, and also skyline

views of the Low Moorland Hills from numerous sensitive receptors.

In conclusion it is accepted that while the landscape character area of Montreathmont Moor has potential to accommodate wind turbine development of the scale proposed, it is considered that this location on the edge of the escarpment is one of the most sensitive areas within the LCT and a turbine of this scale at this location would result in unacceptable landscape and visual impacts.

Human Rights Implications

The decision to refuse this application has potential implications for the applicant in terms of his entitlement to peaceful enjoyment of his possessions (First Protocol, Article 1). For the reasons referred to elsewhere in this report justifying the decision in planning terms, it is considered that any actual or apprehended infringement of such Convention Rights, is justified. Any interference with the applicant's right to peaceful enjoyment of his possessions by refusal of the present application is in compliance with the Council's legal duties to determine this planning application under the Planning Acts and such refusal constitutes a justified and proportionate control of the use of property in accordance with the general interest and is necessary in the public interest with reference to the Development Plan and other material planning considerations as referred to in the report.

Equalities Implications

The issues contained in this report fall within an approved category that has been confirmed as exempt from an equalities perspective.

Decision

The application is Refused

Reason(s) for Decision:

1. That the proposed turbine by virtue of its height and location close to the top of the escarpment which separates the Low Moorland Hills and the Broad Valley Lowland would result in unacceptable landscape and visual impacts and as such the proposal is contrary to policies ER5, ER34 and S6 of the Angus Local Plan Review (2009).

Notes:

Case Officer: James Wright
Date: 21 November 2014

Appendix 1 - Development Plan Policies

Angus Local Plan Review 2009

Policy S1 : Development Boundaries
(a) Within development boundaries proposals for new development on sites not allocated on Proposals Maps will generally be supported where they are in accordance with the relevant policies of the Local Plan.

(b) Development proposals on sites outwith development boundaries (i.e. in the countryside) will generally be supported where they are of a scale and nature appropriate to the location and where they are in accordance with the relevant policies of the Local Plan.

(c) Development proposals on sites contiguous with a development boundary will only be acceptable where there is a proven public interest and social, economic or environmental considerations confirm there is an overriding need for the development which cannot be met within the development boundary.

Policy S3 : Design Quality
A high quality of design is encouraged in all development proposals. In considering proposals the following factors will be taken into account:-

* site location and how the development fits with the local landscape character and pattern of development;
* proposed site layout and the scale, massing, height, proportions and density of the development including consideration of the relationship with the existing character of the surrounding area and neighbouring buildings;
* use of materials, textures and colours that are sensitive to the surrounding area; and
* the incorporation of key views into and out of the development.

Innovative and experimental designs will be encouraged in appropriate locations.

Policy S6 : Development Principles (Schedule 1)
Proposals for development should where appropriate have regard to the relevant principles set out in Schedule 1 which includes reference to amenity considerations; roads and parking; landscaping, open space and biodiversity; drainage and flood risk, and supporting information.

Schedule 1 : Development Principles
Amenity
(a) The amenity of proposed and existing properties should not be affected by unreasonable restriction of sunlight, daylight or privacy; by smells or fumes; noise levels and vibration; emissions including smoke, soot, ash, dust, grit, or any other environmental pollution; or disturbance by vehicular or pedestrian traffic.
(b) Proposals should not result in unacceptable visual impact.
(c) Proposals close to working farms should not interfere with farming operations, and will be expected to accept the nature of the existing local environment. New houses should not be sited within 400m of an existing or proposed intensive livestock building. (Policy ER31).

Roads/Parking/Access
(d) Access arrangements, road layouts and parking should be in accordance with Angus Council's Roads Standards, and use innovative solutions where possible, including 'Home Zones'. Provision for cycle parking/storage for flatted development will also be required.
(e) Access to housing in rural areas should not go through a farm court.
(f) Where access is proposed by unmade/private track it will be required to be made-up to standards set out in Angus Council Advice Note 17 : Miscellaneous Planning Policies. If the track exceeds 200m in length, conditions may be imposed regarding widening or the provision of passing places where necessary.
(g) Development should not result in the loss of public access rights. (Policy SC36)

Landscaping / Open Space / Biodiversity
(h) Development proposals should have regard to the Landscape Character of the local area as set out in the Tayside Landscape Character Assessment (SNH 1998). (Policy ER5)
(i) Appropriate landscaping and boundary treatment should be an integral element in the design and layout of proposals and should include the retention and enhancement of existing physical features (e.g. hedgerows, walls, trees etc) and link to the existing green space network of the local area.
(j) Development should maintain or enhance habitats of importance set out in the Tayside Local Biodiversity Action Plan and should not involve loss of trees or other important landscape features or valuable habitats and species.
(k) The planting of native hedgerows and tree species is encouraged.
(l) Open space provision in developments and the maintenance of it should be in accordance with Policy SC33.

Drainage and Flood Risk
(m) Development sites located within areas served by public sewerage systems should be connected to that system. (Policy ER22)
(n) Surface water will not be permitted to drain to the public sewer. An appropriate system of disposal will be necessary which meets the requirements of the Scottish Environment Protection Agency (SEPA) and

Angus Council and should have regard to good practice advice set out in the Sustainable Urban Drainage Systems Design Manual for Scotland and Northern Ireland 2000.
(o) Proposals will be required to consider the potential flood risk at the location. (Policy ER28)
(p) Outwith areas served by public sewerage systems, where a septic tank, bio-disc or similar system is proposed to treat foul effluent and /or drainage is to a controlled water or soakaway, the consent of SEPA and Angus Council will be required. (Policy ER23).
(q) Proposals should incorporate appropriate waste recycling, segregation and collection facilities (Policy ER38)
(r) Development should minimise waste by design and during construction.

Supporting Information
(s) Where appropriate, planning applications should be accompanied by the necessary supporting information. Early discussion with Planning and Transport is advised to determine the level of supporting information which will be required and depending on the proposal this might include any of the following: Air Quality Assessment; Archaeological Assessment; Contaminated Land Assessment; Design Statement; Drainage Impact Assessment; Environmental Statement; Flood Risk Assessment; Landscape Assessment and/or Landscaping Scheme; Noise Impact Assessment; Retail Impact Assessment; Transport Assessment.

Policy ER34 : Renewable Energy Developments
Proposals for all forms of renewable energy developments will be supported in principle and will be assessed against the following criteria:

(a) the siting and appearance of apparatus have been chosen to minimise the impact on amenity, while respecting operational efficiency;
(b) there will be no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints;
(c) the development will have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons;
(d) no unacceptable environmental effects of transmission lines, within and beyond the site; and
(e) access for construction and maintenance traffic can be achieved without compromising road safety or causing unacceptable permanent change to the environment and landscape, and
(f) that there will be no unacceptable impacts on the quantity or quality of groundwater or surface water resources during construction, operation and decommissioning of the energy plant.

Policy ER35 : Wind Energy Developments
Wind energy developments must meet the requirements of Policy ER34 and also demonstrate:

(a) the reasons for site selection;
(b) that no wind turbines will cause unacceptable interference to birds, especially those that have statutory protection and are susceptible to disturbance, displacement or collision;
(c) there is no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light;
(d) that no wind turbines will interfere with authorised aircraft activity;
(e) that no electromagnetic disturbance is likely to be caused by the proposal to any existing transmitting or receiving system, or (where such disturbances may be caused) that measures will be taken to minimise or remedy any such interference;
(f) that the proposal must be capable of co-existing with other existing or permitted wind energy developments in terms of cumulative impact particularly on visual amenity and landscape, including impacts from development in neighbouring local authority areas;
(g) a realistic means of achieving the removal of any apparatus when redundant and the restoration of the site are proposed.

Policy ER11 : Noise Pollution
Development which adversely affects health, the natural or built environment or general amenity as a result of an unacceptable increase in noise levels will not be permitted unless there is an overriding need which

cannot be accommodated elsewhere.

Proposals for development generating unacceptable noise levels will not generally be permitted adjacent to existing or proposed noise-sensitive land uses. Proposals for new noise-sensitive development which would be subject to unacceptable levels of noise from an existing noise source or from a proposed use will not be permitted.

Policy ER16 : Development Affecting the Setting of a Listed Building
Development proposals will only be permitted where they do not adversely affect the setting of a listed building. New development should avoid building in front of important elevations, felling mature trees and breaching boundary walls.

Policy ER18 : Archaeological Sites of National Importance
Priority will be given to preserving Scheduled Ancient Monuments in situ. Developments affecting Scheduled Ancient Monuments and other nationally significant archaeological sites and historic landscapes and their settings will only be permitted where it can be adequately demonstrated that either:

(a) the proposed development will not result in damage to the scheduled monument or site of national archaeological interest or the integrity of its setting; or
(b) there is overriding and proven public interest to be gained from the proposed development that outweighs the national significance attached to the preservation of the monument or archaeological importance of the site. In the case of Scheduled Ancient Monuments, the development must be in the national interest in order to outweigh the national importance attached to their preservation; and
(c) the need for the development cannot reasonably be met in other less archaeologically damaging locations or by reasonable alternative means; and
(d) the proposal has been sited and designed to minimise damage to the archaeological remains.

Where development is considered acceptable and preservation of the site in its original location is not possible, the excavation and recording of the site will be required in advance of development, at the developer's expense

Policy ER19 : Archaeological Sites of Local Importance
Where development proposals affect unscheduled sites of known or suspected archaeological interest, Angus Council will require the prospective developer to arrange for an archaeological evaluation to determine the importance of the site, its sensitivity to development and the most appropriate means for preserving or recording any archaeological information. The evaluation will be taken into account when determining whether planning permission should be granted with or without conditions or refused.

Where development is generally acceptable and preservation of archaeological features in situ is not feasible Angus Council will require through appropriate conditions attached to planning consents or through a Section 75 Agreement, that provision is made at the developer's expense for the excavation and recording of threatened features prior to development commencing.

Policy ER4 : Wider Natural Heritage and Biodiversity
The Council will not normally grant planning permission for development that would have a significant adverse impact on species or habitats protected under British or European Law, identified as a priority in UK or Local Biodiversity Action Plans or on other valuable habitats or species.

Development proposals that affect such species or habitats will be required to include evidence that an assessment of nature conservation interest has been taken into account. Where development is permitted, the retention and enhancement of natural heritage and biodiversity will be secured through appropriate planning conditions or the use of Section 75 Agreements as necessary.

Policy ER5 : Conservation of Landscape Character
Development proposals should take account of the guidance provided by the Tayside Landscape Character Assessment and where appropriate will be considered against the following criteria:

(a) sites selected should be capable of absorbing the proposed development to ensure that it fits into the landscape;
(b) where required, landscape mitigation measures should be in character with, or enhance, the existing landscape setting;
(c) new buildings/structures should respect the pattern, scale, siting, form, design, colour and density of existing development;
(d) priority should be given to locating new development in towns, villages or building groups in preference to isolated development.

TAYplan Strategic Development plan

The proposal is not of strategic significance and policies of TAYplan are not referred to in this report.

Extract from Angus Local Plan Review (Policy S1, page 10)

DEVELOPMENT BOUNDARIES

1.29 Angus Council has defined development boundaries around settlements to protect the landscape setting of towns and villages and to prevent uncontrolled growth. The presence of a boundary does not indicate that all areas of ground within that boundary have development potential.

***Development boundaries**: Generally provide a definition between built-up areas and the countryside, but may include peripheral areas of open space that are important to the setting of settlements.*

Policy S1 : Development Boundaries

(a) Within development boundaries proposals for new development on sites not allocated on Proposals Maps will generally be supported where they are in accordance with the relevant policies of the Local Plan.

(b) Development proposals on sites outwith development boundaries (i.e. in the countryside) will generally be supported where they are of a scale and nature appropriate to the location and where they are in accordance with the relevant policies of the Local Plan.

***Public interest:** Development would have benefits for the wider community, or is justifiable in the national interest.*
Proposals that are solely of commercial benefit to the proposer would not comply with this policy.

(c) Development proposals on sites contiguous with a development boundary will only be acceptable where there is a proven public interest and social, economic or environmental considerations confirm there is an overriding need for the development which cannot be met within the development boundary.

Extract from Angus Local Plan Review – (Policy S3, page 12)

DESIGN QUALITY

1.37 High quality, people-friendly surroundings are important to a successful development. New development should add to or improve the local environment and should consider the potential to use innovative, sustainable and energy efficient solutions. A well-designed development is of benefit to the wider community and also

provides opportunities to:

- create a sense of place which recognises local distinctiveness and fits in to the local area;
- create high quality development which adds to or improves the local environment and is flexible and adaptable to changing lifestyles;
- create developments which benefit local biodiversity;
- create energy efficient developments that make good use of land
- and finite resources.

Designing Places - A policy statement for Scotland – cottish Executive 2001 *This is the first policy statement on designing places in Scotland and marks the Scottish Executive's determination to raise standards of urban and rural development. Good design is an integral part of a confident, competitive and compassionate Scotland.*

Good design is a practical means of achieving a wide range of social, economic and environmental goals, making places that will be successful and sustainable.

1.38 Design is a material consideration in determining planning applications. In all development proposals consideration should be given to the distinctive features and character of the local area. This includes taking account of existing patterns of development, building forms and materials, existing features such as hedgerows, trees, treelines and walls and distinctive landscapes and skylines.

PAN 68 Design Statements *Design Statements should explain the design principles on which the development is based and illustrate the design solution.*

1.39 The preparation of a design statement to be submitted alongside a planning application is encouraged, particularly for major developments or those affecting listed buildings or conservation areas. Early contact with Planning and Transport is recommended so that the requirement for a design statement can be determined.

The PAN explains what a design statement is, why it is a useful tool, when it is required and how it should be prepared and presented.

The aim is to see design statements used more effectively in the planning process and to

Policy S3 : Design Quality

A high quality of design is encouraged in all development proposals. In considering proposals the following factors will be taken into account:

- **site location and how the development fits with the local landscape character and pattern of development;**
- **proposed site layout and the scale, massing, height, proportions and density of the development including consideration of the relationship with the existing character of the surrounding area and neighbouring buildings;**
- **use of materials, textures and colours that are sensitive to**
- **the surrounding area; and**
- **the incorporation of key views into and out of the development.**

Innovative and experimental designs will be encouraged in appropriate locations.

Extract from Angus Local Plan Review– (Policy S6 & Schedule 1, pages 14 & 15)

DEVELOPMENT PRINCIPLES

1.44 The principles in Schedule 1 provide a 'checklist' of factors which should be considered where relevant to development proposals. They include amenity considerations; roads and parking; landscaping, open space and biodiversity; drainage and flood risk, and supporting information. The Local Plan includes more detailed policies relating to some principles set out. Not all development proposals will require to comply with all of the principles.

Policy S6 : Development Principles

Proposals for development should where appropriate have regard to the relevant principles set out in Schedule 1 which includes reference to amenity considerations; roads and parking; landscaping, open space and biodiversity; drainage and flood risk, and supporting information.

Extract from Angus Local Plan Review– (Policy S6 & Schedule 1, pages 14 & 15)

Schedule 1 : Development Principles

Amenity

a) The amenity of proposed and existing properties should not be affected by unreasonable restriction of sunlight, daylight or privacy; by smells or fumes; noise levels and vibration; emissions including smoke, soot, ash, dust, grit, or any other environmental pollution; or disturbance by vehicular or pedestrian traffic.
b) Proposals should not result in unacceptable visual impact.
c) Proposals close to working farms should not interfere with farming operations, and will be expected to accept the nature of the existing local environment. New houses should not be sited within 400m of an existing or proposed intensive livestock building. (Policy ER31).

Roads/Parking/Access

d) Access arrangements, road layouts and parking should be in accordance with Angus Council's Roads Standards, and use innovative solutions where possible, including 'Home Zones'. Provision for cycle parking/storage for flatted development will also be required.
e) Access to housing in rural areas should not go through a farm court.
f) Where access is proposed by unmade/private track it will be required to be made-up to standards set out in Angus Council Advice Note 17: Miscellaneous Planning Policies. If the track exceeds 200m in length, conditions may be imposed regarding widening or the provision of passing places where necessary
g) Development should not result in the loss of public access rights. (Policy SC36)

Landscaping / Open Space / Biodiversity

h) Development proposals should have regard to the Landscape Character of the local area as set out in the Tayside Landscape Character Assessment (SNH 1998). (Policy ER5)
i) Appropriate landscaping and boundary treatment should be an integral element in the design and layout of proposals and should include the retention and enhancement of existing physical features (e.g. hedgerows, walls, trees etc) and link to the existing green space network of the local area.
j) Development should maintain or enhance habitats of importance set out in the Tayside Local Biodiversity Action Plan and should not involve loss of trees or other important landscape features or valuable habitats and species.
k) The planting of native hedgerows and tree species is encouraged.
l) Open space provision in developments and the maintenance of it should be in accordance with Policy SC33.

Drainage and Flood Risk

m) Development sites located within areas served by public sewerage systems should be connected to that system. (Policy ER22)
n) Surface water will not be permitted to drain to the public sewer. An appropriate system of disposal will be necessary which meets the requirements of the Scottish Environment Protection Agency (SEPA) and Angus Council and should have regard to good practice advice set out in the Sustainable Urban Drainage Systems Design Manual for Scotland and Northern Ireland 2000.
o) Proposals will be required to consider the potential flood risk at the location. (Policy ER28)
p) Outwith areas served by public sewerage systems, where a septic tank, bio-disc or similar system is proposed to treat foul effluent and /or drainage is to a controlled water or soakaway, the consent of SEPA and Angus Council will be required. (Policy ER23).

Waste Management

q) Proposals should incorporate appropriate waste recycling, segregation and collection facilities (Policy ER38).
r) Development should minimise waste by design and during construction.

Supporting Information

s) (s) Where appropriate, planning applications should be accompanied by the necessary supporting information. Early discussion with Planning and Transport is advised to determine the level of supporting information which will be required and depending on the proposal this might include any of the following: Air Quality Assessment; Archaeological Assessment; Contaminated Land Assessment; Design Statement; Drainage Impact Assessment; Environmental Statement; Flood Risk Assessment; Landscape Assessment and/or Landscaping Scheme; Noise Impact Assessment; Retail Impact Assessment; Transport Assessment.

Wider Natural Heritage and Biodiversity

3.9 The protection and enhancement of the natural heritage value of the wider environment beyond the confines of designated areas is necessary to promote biodiversity. Species or habitats protected under the Wildlife and Countryside Act 1981, EC Birds or Habitat Directives or identified as priorities in the UK Biodiversity Action Plan may be found outwith designated sites. Local Biodiversity Action Plans have been prepared for both Tayside and the Cairngorms with the aim of safeguarding the future of the area's habitats and species. Implementation of these LBAPs is progressing through the preparation and implementation of a series of habitat and species action plans. The Local Biodiversity Action Plans for Tayside and the Cairngorms will be material considerations in the determination of planning applications.

Policy ER4 : Wider Natural Heritage and Biodiversity

The Council will not normally grant planning permission for development that would have a significant adverse impact on species or habitats protected under British or European Law, identified as a priority in UK or Local Biodiversity Action Plans or on other valuable habitats or species.

Development proposals that affect such species or habitats will be required to include evidence that an assessment of nature conservation interest has been taken into account. Where development is permitted, the retention and enhancement of natural heritage and biodiversity will be secured through appropriate planning conditions or the use of Section 75 Agreements as necessary.

Landscape Character

3.10 The landscape of Angus is one of its most important assets. It ranges in character from the rugged mountain scenery of the Angus Glens, through the soft rolling cultivated lowland landscape of Strathmore to the sandy bays and cliffs of the coast.

3.11 A small part of north-west Angus is statutorily designated as part of a larger National Scenic Area (NSA). The character and quality of this landscape is of national significance and special care should be taken to conserve and enhance it. Part of the upland area of Angus, including the NSA, is contained within the Cairngorms National Park which is excluded from the Angus Local Plan Review. The guidance provided by the adopted Angus Local Plan will remain in force until it is replaced by a Cairngorms National Park Local Plan prepared by the National Park Authority. The Cairngorms was made a National Park in September 2003 because it is a unique and special place that needs to be cared for – both for the wildlife and countryside it contains and for the people that live in it, manage it and visit it. It is Britain's largest national park.

3.12 In seeking to conserve the landscape character of the area it is important to assess the impact of development proposals on all parts of the landscape. To assist in this the "Tayside Landscape Character Assessment (1999)" commissioned by Scottish Natural Heritage establishes landscape character zones and key character features within the local plan area to provide a better understanding of them and thus to enable better conservation, restoration, management and enhancement. Landscape Character Zones for the Local Plan Area are shown in Figure 3.2.

National Scenic Area:
Nationally important area of outstanding natural beauty, representing some of the best examples of Scotland's grandest landscapes particularly lochs and mountains.

***National Park (Scotland) Act 2000** sets out four key aims for the park:*

- *To conserve and enhance the natural and cultural heritage of the area;*
- *To promote sustainable use of the natural resources of the area;*
- *To promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public;*
- *To promote sustainable economic and social development of the area's communities.*

Tayside Landscape Character Assessment 1999:
A detailed hierarchical assessment based on variations in the Tayside landscape, with a series of management and planning guidelines designed to conserve and enhance its distinctive character.

Figure 3.2 : Landscape Character Zones

3.13 Where appropriate, development proposals will be considered in the context of the guidance provided by the Tayside Landscape Character Assessment. The assessment identifies different landscape character zones, considers their capacity to absorb change, and indicates how various types of development might best be accommodated to conserve characteristic landscape features and to strengthen and enhance landscape quality. Particular attention is focussed on the location, siting and design of development and the identification of proposals which would be detrimental to the landscape character of Angus.

Policy ER5 : Conservation of Landscape Character

Development proposals should take account of the guidance provided by the Tayside Landscape Character Assessment and where appropriate will be considered against the following criteria:

(a) sites selected should be capable of absorbing the proposed development to ensure that it fits into the landscape;
(b) where required, landscape mitigation measures should be in character with, or enhance, the existing landscape setting;
(c) new buildings/structures should respect the pattern, scale, siting, form, design, colour and density of existing development;
(d) priority should be given to locating new development in towns, villages or building groups in preference to isolated development.

Noise Pollution

3.20 Noise can have a significant impact on our health, quality of life and the general quality of the environment. The planning system has an important role in preventing and limiting noise pollution and the noise implications of development can be a material consideration in determining applications for planning permission adjacent to existing noise sensitive development or where new noise sensitive development is proposed.

Policy ER11 : Noise Pollution

Development which adversely affects health, the natural or built environment or general amenity as a result of an unacceptable increase in noise levels will not be permitted unless there is an overriding need which cannot be accommodated elsewhere. Proposals for development generating unacceptable noise levels will not generally be permitted adjacent to existing or proposed noise sensitive land uses.

Proposals for new noise-sensitive development which would be subject to unacceptable levels of noise from an existing noise source or from a proposed use will not be permitted.

Planning Advice Note 56 - Planning and Noise (1999)
Noise sensitive land uses should be generally regarded as including housing, hospitals, educational establishments, offices and some livestock farms.

LISTED BUILDINGS

3.34 The relationship of a listed building with the buildings, landscape and spaces around it is an essential part of its character. The setting of a listed building is, therefore, worth preserving and may extend to encompass land or buildings some distance away. Insensitive development can erode or destroy the character and/or setting of a listed building. Consequently planning permission will not be granted for development which adversely affects the setting of a Listed Building. Trees and landscaping, boundary walls and important elevations may be particularly sensitive to the effects of development.

Policy ER16 : Development Affecting the Setting of a Listed Building

Development proposals will only be permitted where they do not adversely affect the setting of a listed building. New development should avoid building in front of important elevations, felling mature trees and breaching boundary walls.

Ancient Monuments and Archaeological Sites

3.36 Angus has a rich heritage of archaeological remains ranging from crop marks and field systems through to structures such as standing stones, hill forts, castles and churches. They are evidence of the past development of society and help us to understand and interpret the landscape of today. They are a finite and non-renewable resource to be protected and managed.

3.37 Sites considered to be of national importance are scheduled by Scottish Ministers as Ancient Monuments. There are over 200 such sites in Angus with additional sites regularly being incorporated into the List. In addition, there are other monuments of regional or local significance. All of these sites and monuments, whether scheduled or not, are fragile and irreplaceable.

3.38 The owner or occupier of a scheduled ancient monument is required to obtain consent from Historic Scotland for repairs, alterations, demolition, or any work affecting the monument. In order therefore to protect the scheduled monument any planning application that may affect it will be notified to Historic Scotland and their comments taken into account in determining development proposals.

Policy ER18 : Archaeological Sites of National Importance

Priority will be given to preserving Scheduled Ancient Monuments in situ. Developments affecting Scheduled Ancient Monuments and other nationally significant archaeological sites and historic landscapes and their settings will only be permitted where it can be adequately demonstrated that either:

a) the proposed development will not result in damage to the scheduled monument or site of national archaeological interest or the integrity of its setting; or
b) there is overriding and proven public interest to be gained from the proposed development that outweighs the national significance attached to the preservation of the monument or archaeological importance of the site. In the case of Scheduled Ancient Monuments, the development must be in the national interest in order to outweigh the national importance attached to their preservation; and
c) the need for the development cannot reasonably be met in other less archaeologically damaging locations or by reasonable alternative means; and
d) the proposal has been sited and designed to minimise damage to the archaeological remains.

Where development is considered acceptable and preservation of the site in its original location is not possible, the excavation and recording of the site will be required in advance of development, at the developer's expense.

NPPG 5: Planning and Archaeology (1994)
Sets out the role of the planning system in protecting ancient monuments and archaeological sites and landscapes. The Government seeks to encourage the preservation of our heritage of sites and landscapes of archaeological and historic interest. The development plan system provides the policy framework for meeting the need for development along with the need for preserving archaeological resources.

PAN 42 : Archaeology – the Planning Process and Scheduled Monument Procedure (1994)
Archaeological remains offer a tangible, physical link with the past. They are a finite and non-renewable resource containing unique information about our past and the potential for an increase in future knowledge. Such remains are part of Scotland's identity and are valuable both for their own sake and for education, leisure and tourism. The remains are often fragile and vulnerable to damage or destruction; care must therefore be taken to ensure that they are not needlessly destroyed.

Scheduled Ancient Monument (SAM):
The site of a scheduled monument and any other monument which in the opinion of the Scottish Ministers is of public interest by reason of its historic, architectural, traditional, artistic or archaeological interest.

3.39 While the best examples of valuable archaeological sites are designated of national importance there are numerous examples of historic sites in both urban and rural areas that are of local significance. There are also other sites where finds may have been made in the past but no remains are known to date.

3.40 Within the mediaeval burghs of Arbroath, Brechin, Forfar and Montrose areas of primary and secondary archaeological significance were identified through the Scottish Burgh Surveys undertaken in the late 1970s. This provides an indicator for prospective developers that where redevelopment is being proposed an archaeological assessment may be required prior to commencement of works or at least a watching brief during excavations.

Policy ER19 : Archaeological Sites of Local Importance

Where development proposals affect unscheduled sites of known or suspected archaeological interest, Angus Council will require the prospective developer to arrange for an archaeological evaluation to determine the importance of the site, its sensitivity to development and the most appropriate means for preserving or recording any archaeological information. The evaluation will be taken into account when determining whether planning permission should be granted with or without conditions or refused.

Where development is generally acceptable and preservation of archaeological features in situ is not feasible Angus Council will require through appropriate conditions attached to planning consents or through a Section 75 Agreement, that provision is made at the developer's expense for the excavation and recording of threatened features prior to development commencing.

Renewable Energy

3.72 The Scottish Executive is strongly supportive of renewable energies and has set a target of 17-18% of Scotland's electricity supply to come from renewable sources by 2010. NPPG6: Renewable Energy Developments (Revised 2000) considers a range of renewable energy technologies and encourages the provision of a positive policy framework to guide such developments. The Scottish Executive's aspiration is for renewable sources to contribute 40% of electricity production by 2020, an estimated total installed capacity of 6GW (Minister for Enterprise, July 2005). This will require major investment in commercial renewable energy production and distribution capacity throughout Scotland.

NPPG6: Renewable Energy Developments (Revised 2000)

The Scottish Ministers wish to see the planning system make positive provision for renewable energy whilst at the same time:

- *meeting the international and national statutory obligations to protect designated areas, species, and habitats of natural heritage interest and the historic environment from inappropriate forms of development; and*
- *minimising the effects on local communities.*

3.73 The Dundee and Angus Structure Plan acknowledges the advantages of renewable energy in principle but also recognises the potential concerns associated with development proposals in specific locations. Angus Council supports the principle of developing sources of renewable energy in appropriate locations. Large-scale developments will only be encouraged to locate in areas where both technical (e.g. distribution capacity and access roads) and environmental capacity can be demonstrated.

3.74 Developments which impinge on the Cairngorms National Park will be considered within the context of the National Park Authority's Planning Policy No1: Renewable Energy.

Renewable Energy Sources

3.75 Offshore energy production, including wind and tidal methods, has the potential to make a significant contribution to the production of renewable energy in Scotland. Other than small-scale onshore support buildings, such developments currently fall outwith the remit of the planning system.

Large-scale *projects which may or will require an Environmental Assessment. These are defined as hydroelectric schemes designed to produce more than 0.5MW and wind farms of more than 2 turbines or where the hub height of any turbine or any other structure exceeds 15m.*

3.76 All renewable energy production, including from wind, water, biomass, waste incineration and sources using emissions from wastewater treatment works and landfill sites will require some processing, generating or transmission plant. Such developments, that can all contribute to reducing emissions will have an impact on the local environment and will be assessed in accordance with Policy ER34.

SNH's ***EIA Handbook*** *identifies 6 types of impact which may require an assessment:*

- *Landscape and visual;*
- *Ecological;*
- *Earth heritage;*
- *Soil;*
- *Countryside access; and*
- *Marine environment.*

Policy ER34 : Renewable Energy Developments

Proposals for all forms of renewable energy development will be supported in principle and will be assessed against the following criteria:

(a) the siting and appearance of apparatus have been chosen to minimise the impact on amenity, while respecting operational efficiency;
(b) there will be no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints;
(c) the development will have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons;
(d) no unacceptable environmental effects of transmission lines, within and beyond the site; and
(e) access for construction and maintenance traffic can be achieved without compromising road safety or causing unacceptable permanent and significant change to the environment and landscape.

Wind Energy

3.77 Onshore wind power is likely to provide the greatest opportunity and challenge for developing renewable energy production in Angus. Wind energy developments vary in scale but, by their very nature and locational requirements, they have the potential to cause visual impact over long distances. Wind energy developments also raise a number of environmental issues and NPPG 6 advises that planning policies should guide developers to broad areas of search and to establish criteria against which to consider development proposals. In this respect, Scottish Natural Heritage Policy Statement 02/02, Strategic Locational Guidance for Onshore Wind Farms in Respect of the Natural Heritage, designates land throughout Scotland as being of high, medium or low sensitivity zones in terms of natural heritage. Locational guidance is provided to supplement the broad-brush zones.

3.78 A range of technical factors influence the potential for wind farm development in terms of location and viability. These include wind speed, access to the distribution network, consultation zones, communication masts, and proximity to radio and radar installations. Viability is essentially a matter for developers to determine although annual average wind speeds suitable for commercially viable generation have been recorded over most of Angus, other than for sheltered valley bottoms. Environmental implications will require to be assessed in conjunction with the Council, SNH and other parties as appropriate.

Strategic Locational Guidance for Onshore Windfarms in Respect of the Natural Heritage - Scottish Natural Heritage Policy Statement No 02/02

Zone 3 *– high natural heritage sensitivity. Developers should be encouraged to look outwith Zone 3 for development opportunities*

Zone 2 *– medium natural heritage sensitivity. …while there is often scope for wind farm development within Zone 2 it may be restricted in scale and energy output and will require both careful choice of location and care in design to avoid natural heritage impacts.*

Zone 1 *- …inclusion of an area in Zone 1 does not imply absence of natural heritage interest. Good siting and design should however enable such localised interests to be respected, so that overall within Zone 1, natural heritage interests do not present a significant constraint on wind farm development*

Figure 3.4 : Geographic Areas

TLCA Designation
- 1a Upper Highland Glens
- 1b Mid Highland Glens
- 3 Highland Summits & Plateaux
- 5 Highland Foothills

TLCA Designation
- 8 Igneous Hills
- 10 Broad Valley Lowland
- 12 Low Moorland Hills
- 13 Dipslope Farmland

TLCA Designation
- 14a Coast with sand
- 14b Coast with cliffs
- 15 Lowland Basin

3.79 Scottish Natural Heritage published a survey of Landscape Character, the Tayside Landscape Character Assessment (TLCA), which indicates Angus divides naturally into three broad geographic areas – the Highland, Lowland and hills and the Coast. The Tayside Landscape Character Assessment provides a classification to map these areas based on their own particular landscape characteristics (Fig 3.4).

Area	TLCA Classification	Landscape Character
1 Highland	1a, 1b, 3, 5	Plateaux summits, glens and complex fault line topography
2 Lowland and hills	8, 10, 12,13	Fertile strath, low hills and dipslope farmland.
3 Coast	14a, 14b, 15	Sand and cliff coast and tidal basin

The impact of wind farm proposals will, in terms of landscape character, be assessed against the TLCA classifications within the wider context of the zones identified in SNH Policy Statement 02/02.

3.80 The open exposed character of the Highland summits and the Coast (Areas 1 and 3) is sensitive to the potential landscape and visual impact of large turbines. The possibility of satisfactorily accommodating turbines in parts of these areas should not be discounted although locations associated with highland summits and plateaux, the fault line topography and coast are likely to be less suitable. The capacity of the landscape to absorb wind energy development varies. In all cases, the scale layout and quality of design of turbines will be an important factor in assessing the impact on the landscape.

3.81 The Highland and Coast also have significant natural heritage value, and are classified in SNH Policy Statement 02/02 as mainly Zone 2 or 3 - medium to high sensitivity. The development of large scale wind farms in these zones is likely to be limited due to potential adverse impact on their visual character, landscape and other natural heritage interests.

3.82 The Lowland and Hills (Area 2) comprises a broad swathe extending from the Highland boundary fault to the coastal plain. Much of this area is classified in Policy Statement 02/02 as Zone 1- lowest sensitivity. Nevertheless, within this wider area there are locally important examples of higher natural heritage sensitivity such as small- scale landscapes, skylines and habitats which will influence the location of wind turbines. In all cases, as advocated by SNH, good siting and design should show respect for localised interests.

3.83 Wind farm proposals can affect residential amenity, historic and archaeological sites and settings, and other economic and social activities including tourism. The impact of wind farm developments on these interests requires careful assessment in terms of sensitivity and scale so that the significance can be determined and taken into account.

3.84 Cumulative impact occurs where wind farms/turbines are

visually interrelated e.g. more than one wind farm is visible from a single point or sequentially in views from a road or a footpath. Landscape and visual impact can be exacerbated if wind turbines come to dominate an area or feature. Such features may extend across local authority, geographic or landscape boundaries and impact assessments should take this into account. Environmental impacts can also be subject to cumulative effect – for example where a number of turbine developments adversely affect landscape character, single species or habitat type.

3.85 SNH advise that an assessment of cumulative effects associated with a specific wind farm proposal should be limited to all existing and approved developments or undetermined Section 36 or planning applications in the public domain. The Council may consider that a pre-application proposal in the public domain is a material consideration and, as such, may decide it is appropriate to include it in a cumulative assessment. Similarly, projects outwith the 30km radius may exceptionally be regarded as material in a cumulative context.

NPPG6 : Renewable Energy Developments (Revised 2000)

***Large-scale** projects which may or will require an Environmental Assessment. These are defined as hydroelectric schemes designed to produce more than 0.5MW and wind farms of more than 2 turbines or where the hub height of any turbine or any other structure exceeds 15m.*

Policy ER35 : Wind Energy Development

Wind energy developments must meet the requirements of Policy ER34 and also demonstrate:

(a) the reasons for site selection;
(b) that no wind turbines will cause unacceptable interference to birds, especially those that have statutory protection and are susceptible to disturbance, displacement or collision;
(c) there is no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light;
(d) that no wind turbines will interfere with authorised aircraft activity;
(e) that no electromagnetic disturbance is likely to be caused by the proposal to any existing transmitting or receiving system, or (where such disturbances may be caused) that measures will be taken to minimise or remedy any such interference;
(f) that the proposal must be capable of co-existing with other existing or permitted wind energy developments in terms of cumulative impact particularly on visual amenity and landscape, including impacts from development in neighbouring local authority areas;
(g) a realistic means of achieving the removal of any apparatus when redundant and the restoration of the site are proposed.

Local Community Benefit

3.86 Where renewable energy schemes accord with policies in this local plan there may be opportunities to secure contributions from developers for community initiatives. Such contributions are not part of the planning process and as such will require to be managed through other means than obligations pursuant to Section 75 Planning Agreement. Community contributions are separate from planning gain and will not be considered as part of any planning application.

TAY12: LOW MOORLAND HILLS

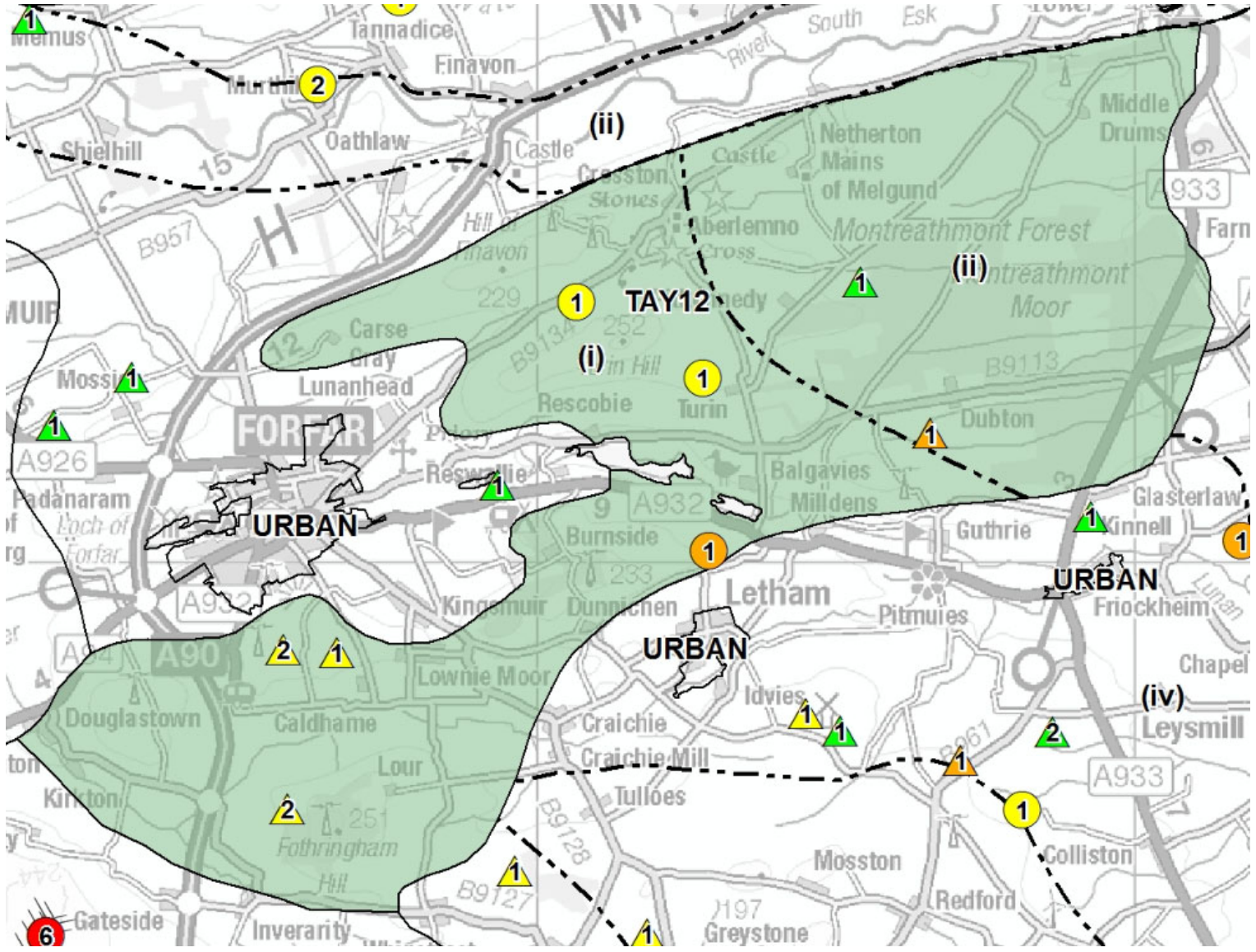
The Low Moorland Hills LCA is situated to the east and south of Forfar and lies between Strathmore and the *Dipslope Farmland*, continuing a gradually diminishing line of hills from the Sidlaws in the west to near sea level farmland at the Montrose Basin in the east. The LCA has been divided into two sub-areas on the basis of differences in landscape character and sensitivity: the Forfar Hills in the south and west and Montreathmont Moor in the north and east.

(i) FORFAR HILLS

A varied landscape of small steep hills and ridges set within a wider area of medium scale rolling/undulating farmland. The hills provide a backdrop to Forfar and define the southern edge of the South Esk section of Strathmore. Most of the hills are very visible from the A90. There are a number of hillforts and viewpoints located on the hills and other points of interest such as the standing stones at Aberlemno. There are scattered small settlements throughout the farmland, connected by a network of small lanes, sometimes twisting over the hills. The distinctive Rescobie Lochs and A932 lie in a valley separating the distinctly bald ridges north east of Forfar from the more tree covered hills to the east and south of the town. An electricity transmission line crosses the northern edge of the LCA at Hill of Finavon. This sub-area has higher visual sensitivity and complex, modest scale landforms compared with the sub-area further to the east.

(ii) MONTREATHMONT MOOR

This LCA, lying east of the Forfar Hills, is distinctly different in character. The landform is predominantly gently undulating and gradually slopes down to the lower Montrose Basin LCA to the east. There are no distinctive hill landforms, although the northern edge forms an escarpment of some 100m descending to the River South Esk. It is a medium to large scale farming and forestry landscape dominated by Montreathmont Forest which is a distinctively large mature lowland forest dominated by coniferous planting. It is well populated by scattered properties and farmhouses in the farmland areas outside the forest, with a network of small roads.



Area (i) the Forfar Hills, with a distinctive series of hill landforms

Area (ii) Montreathmont Moor: a gently undulating landform with farmland surrounding an extensive area of forest

AC3

Table 6.1(f): Summary of Landscape Capacity, Cumulative Effects and Guidance for Future Wind Energy Development: Low Moorland Hills

LANDSCAPE CHARACTER TYPE TAY 12: LOW MOORLAND HILLS

Key: ○ No Capacity ◯ Low Capacity ● Medium Capacity ● High Capacity **Turbine Size: Small/Medium=15-<30m; Medium=30-<50m; Medium/Large=50-<80m; Large=80-<125m; Very Large=125m+**

BASE LANDSCAPE CAPACITY (i.e. not taking account of current wind energy development)									CURRENT CONSENTED DEVELOPMENT		PROPOSED LIMITS TO FUTURE DEVELOPMENT (i.e. proposed acceptable level of wind energy development)							
Landscape Sensitivity to Wind Energy Development				Landscape Capacity (Related to turbine size)					Existing/ Consented Developments	Current Wind Energy Landscape Type(s)	Future Wind Energy Landscape Type(s)	Remaining Landscape Capacity (Related to turbine size)					Current Applications	Analysis & Guidelines (Refer to Detailed Guidance for Further Information on Siting and Design)
Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	S/M	M	M/L	L	VL				S/M	M	M/L	L	VL		
Landscape Character Area: *Forfar Hills* Sub Area: *(i) Forfar Hills*																		
Med/ High	Med/ High	**Med/ High**	**Med**	●	●	○	○	○	5 medium size turbines scattered south of Forfar. One medium/ large (77m) turbine at Pickerton just outwith sub area boundary north of Guthrie.	***Low Moorland Hills with Wind Turbines/ Occasional Wind Turbines/ No Wind Turbines***	***Low Moorland Hills with Wind Turbines/ Occasional Wind Turbines***	●	◯	○	○	○	Two medium turbines either side of Turin Hill east of Forfar and one medium/large (66m) turbine on southern boundary with *Dipslope Farmland* at Letham.	**Landscape Analysis:** A varied landscape of small steep hills and rolling/undulating farmland. Both the higher visual sensitivity and complex, modest scale landforms indicate that only small groups of turbines up to 50m would be appropriate to this area. **Comments on Consented and Proposed Turbines:** Current medium turbines south of Forfar within capacity of this area although two turbines on Fotheringham Hill are high up the hillside. Proposals for turbines at Turin Hill are within capacity and suitably located. Medium/large turbine N of Letham larger than recommended maximum size. Recent proposal for three large turbines at Finavon Hill dismissed at appeal due to adverse landscape/visual impacts relating to the size of the turbines.
											Max. Numbers in Group	*1-5*	*1-3*					
											Min Group Separation Distances (km) South of Forfar	*2-4* *2-4*	*3-6* *2-4*					
Landscape Character Area: *Forfar Hills* Sub Area: *(ii) Montreathmont Moor*																		
Med/ Low	Med	**Med**	**Med**	●	●	◯	○	○	Currently one medium/large turbine in the S at Pickerton and one small/medium turbine 3km north of this consented.	***Low Moorland Hills with Occasional Wind Turbines/ No Wind Turbines***	***Low Moorland Hills with Occasional Wind Turbines***	●	●	◯	○	○	No current applications.	**Landscape analysis:** Medium to large scale farming and forestry landscape dominated by Montreathmont forest. Simple undulating landform with no distinctive hills. It is well populated agricultural land outside the forest. The landscape is able to accommodate larger turbine sizes. **Comments on Consented and Proposed Turbines:** The current consented turbines fall well within capacity. Pickerton turbine is larger than maximum for adjacent sub-area, which it influences. A proposal for 11 very large turbines in Montreathmont Forest was dismissed at appeal in 2009 due to adverse landscape and visual effects, particularly on the amenity of surrounding properties.
											Max. Numbers in Group	*1-5*	*1-3*	*1-3*				
											Min Group Separation Distances (km)	*2-4*	*3-6*	*5-10*				

AC3

GUIDANCE: TAY12 LOW MOORLAND HILLS

(i) FORFAR HILLS

Proposed Limits to Future Development:

Low Moorland Hills with Occasional Wind Turbines (east of Forfar)

Turbine Sizes: 15-<30m (small/medium); 30-<50m (medium)

Group Sizes: 1-5 (small/medium; medium)

Separation Distances: 2-4km (small/medium); 3-6km (medium)

Low Moorland Hills with Wind Turbines (south of Forfar)

Turbine Sizes: 15-<30m (small/medium); 30-<50m (medium)

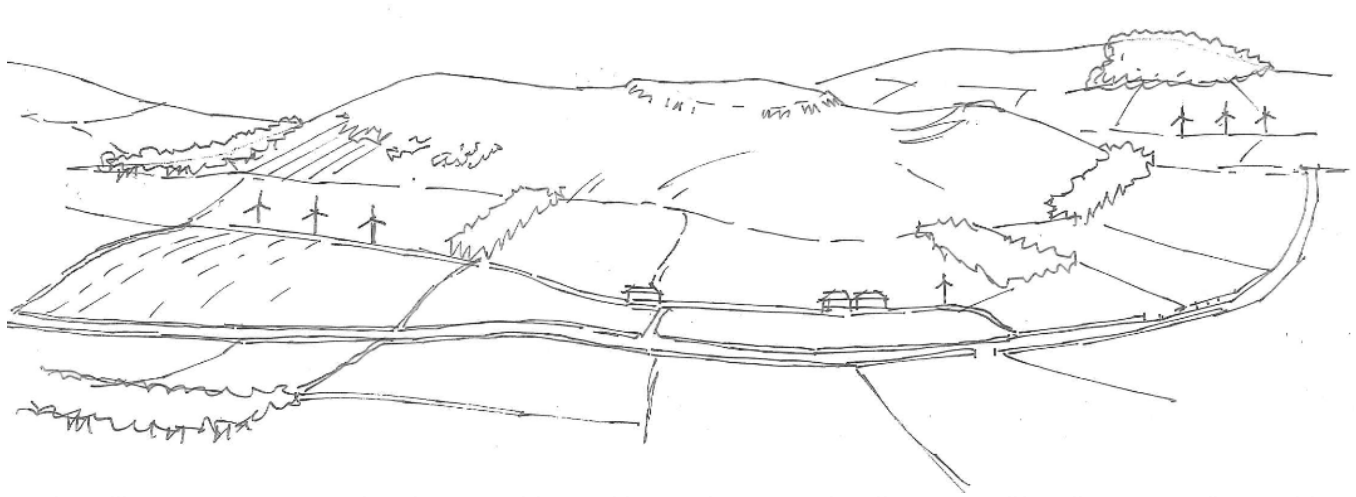
Group Sizes: 1-5 (small/medium); 1-3 (medium)

Separation Distances: 2-4km (small/medium and medium)

Detailed Guidance

Locate turbines in the enclosed farmland or on lower slopes of the hills, avoiding skylines and reducing intervisibility between turbine groups. Relate the height of turbines to the scale of the landscape, with particular regard to the vertical scale of the hills. Larger turbines should be located away from the smaller scale hills and hill slopes to avoid diminishing the apparent scale of the slopes or breaking the skyline. Proximity to residential properties or settlements may also limit opportunities for locating larger turbines and/or turbine groups. Site turbines away from the electricity transmission line on Hill of Finavon to avoid cumulative clutter.

Position turbines so that they relate clearly to landscape features such as field boundaries, breaks in slope and larger farm buildings. Separate turbine groupings sufficiently to ensure that clear intervisibility is infrequent. This can be achieved through selecting appropriate turbine sizes, separation distances and/or the intervention of landforms and tree groups. Place smaller turbines in locations where they are not close to, or readily intervisible with, larger turbines and are more closely associated with built development. Where there are two or three closely located applications for single turbines of the same size, exploit opportunities for clustering as a group in preference to separation.



Forfar Hills cannot accommodate larger turbines without adverse scale effects. Small/medium or medium turbines will not dominate the landforms. Turbine groups in the enclosed farmland can also be visually separated. Smaller turbines may be accommodated in the same view if closely associated with buildings

There is a higher proportion of enclosed farmland south of Forfar compared with the greater preponderance of open hills to the east. A number of medium size turbines are already consented in this area. Given the current pattern of development further medium size turbines could be located in this area to create a landscape with wind turbines between hills. Separation of turbines/groups by distance or landform should be sufficient to avoid loose clustering of turbines within or between groupings dominating an area. Turbines should be located to avoid breaking the skyline on Balmashanner Hill above Forfar.

(ii) MONTREATHMONT MOOR

Proposed Limits to Future Development: Low Moorland Hills with Occasional Wind Turbines

Turbine Sizes: 15-<30m (small/medium); 30-<50m (medium); 50-<80m (medium/large)

Group Sizes: 1-5 (small/medium and medium); 1-3 (medium/large)

Separation Distances: 2-4km (small/medium); 3-6km (medium); 5-10km (medium/large)

Detailed Guidance

Turbines can be located in most parts of this undulating landscape; the farmland area or the forest, with the key determining issues being the need to avoid domination of the landscape character and of views from residential properties. The size of turbines should relate to the scale of the landscape, which is principally determined by the pattern of field boundaries and forestry but also by proximity to features such as buildings and small tree groups. To the north the escarpment above Strathmore forms a taller and steeper landform than elsewhere in the sub-area.

Locate larger turbines (medium/large) in areas further from residential properties, the forest being the most suitable area in terms of low population density and uniform landscape character. Smaller size turbines (small/medium, medium and potentially medium/large) are more suitably sited in farmland areas. Proximity to residential properties or settlements may limit opportunities for locating larger turbines and/or turbine groups.

Position turbines so that they relate clearly to landscape features such as field boundaries, rolling ridges and farm buildings. Within the forest existing clearings would be most suitable and the most mature and diverse areas should be avoided. Separate turbine groupings sufficiently to ensure that the landscape is not dominated and that significant areas with clear intervisibility between developments is infrequent. This may be achieved through selecting appropriate turbine sizes and separation distances and through exploiting areas of trees and forestry to screen views. Where there are two or three closely located applications for single turbines of the same size, exploit opportunities for clustering as a group in preference to separation.

Avoid locating medium/large turbines close to the escarpment slope above Strathmore (typically rising 60m-100m from valley floor) and to the eastern Forfar Hills (ranging from 50m-140m higher than the farmland). The turbines would dominate the modest scale of these landforms.

AC3

AC4

LeslieIA

From: ALLEN, Sarah J [Sarah.ALLEN@nats.co.uk] on behalf of NATS Safeguarding [NATSSafeguarding@nats.co.uk]

Sent: 22 April 2014 09:33

To: PLNProcessing

Subject: Your Ref: 14/00281/FULL (Our Ref: W(F)15691)

The proposed development has been examined from a technical safeguarding aspect and does not conflict with our safeguarding criteria. Accordingly, NATS (En Route) Public Limited Company ("NERL") has no safeguarding objection to the proposal.

However, please be aware that this response applies specifically to the above consultation and only reflects the position of NERL (that is responsible for the management of en route air traffic) based on the information supplied at the time of this application. This letter does not provide any indication of the position of any other party, whether they be an airport, airspace user or otherwise. It remains your responsibility to ensure that all the appropriate consultees are properly consulted.

If any changes are proposed to the information supplied to NERL in regard to this application which become the basis of a revised, amended or further application for approval, then as a statutory consultee NERL requires that it be further consulted on any such changes prior to any planning permission or any consent being granted.

Yours faithfully,

Sarah Allen
Technical Administrator
On behalf of NERL Safeguarding Office

Defence Infrastructure Organisation

Mr Michael Billings
Safeguarding Assistant
Ministry of Defence
Safeguarding – Wind Energy
Kingston Road
Sutton Coldfield
West Midlands B75 7RL
United Kingdom

Telephone [MOD]: +44 (0)121 3112025
Facsimile [MOD]: +44 (0)121 3112218
E-mail: DIOODC-IPSSG2a1a@mod.uk

Your Reference: 14/00281/FULL

Our Reference: DIO/SUT/43/10/1/20497

Mr James Wright
Angus Council
DD8 3LG

07 May 2014

Dear Mr Wright

Please quote in any correspondence: 20497

Site Name: 200m North East of Balnacake Farm

Proposal: Erection of Wind Turbine

Planning Application Number: 14/00281/FULL

Site Address: Aldbar, Brechin

Thank you for consulting the Ministry of Defence (MOD) on the above Planning Application in your communication dated 21 April 2014.

I am writing to tell you that the MOD has no objection to the proposal.

The application is for 1 turbine at 67 metres to blade tip. This has been assessed using the grid references below as submitted in the planning application or in the developers' your pro-forma.

Turbine	100km Square Letter	Easting	Northing
1	NO	56161	57678

In the interests of air safety, the MOD requests that all turbines are fitted with 25 candela omni-directional red lighting or infrared aviation lighting with an optimised flash pattern of 60 flashes per minute of 200ms to 500ms duration at the highest practicable point.

The principal safeguarding concern of the MOD with respect to the development of wind turbines relates to their potential to create a physical obstruction to air traffic movements and cause interference to Air Traffic Control and Air Defence radar installations.

Defence Infrastructure Organisation Safeguarding wishes to be consulted and notified of the progression of planning applications and submissions relating to this proposal to verify that it will not adversely affect defence interests.

If planning permission is granted we would like to be advised of the following;

- the date construction starts and ends;
- the maximum height of construction equipment;
- the latitude and longitude of every turbine.

This information is vital as it will be plotted on flying charts to make sure that military aircraft avoid this area.

If the application is altered in any way we must be consulted again as even the slightest change could unacceptably affect us.

I hope this adequately explains our position on the matter. If you require further information or would like to discuss this matter further please do not hesitate to contact me.

Further information about the effects of wind turbines on MOD interests can be obtained from the following websites:

***MOD*:** http://www.mod.uk/DefenceInternet/MicroSite/DIO/WhatWeDo/Operations/ModSafeguarding.htm

Yours sincerely

Michael Billings
Safeguarding Assistant – Wind Energy
Defence Infrastructure Organisation

SAFEGUARDING SOLUTIONS TO DEFENCE NEEDS

AC6

LeslieIA

From: Anne Phillips [APhillips@hial.co.uk]
Sent: 22 April 2014 10:50
To: PLNProcessing
Subject: Plan App 14/00281/FULL - Erect Single Wind Turbine NE of Balnacake Farm Aldbar Brechin
Your Ref: 14/00281/FULL

Dear Sir/Madam,

PROPOSAL: **Erect Single Wind Turbine (max height 67m to blade tip)**
LOCATION: **200m NE of Balnacake Farm Aldbar Brechin**

With reference to the above proposed development, it is confirmed that our calculations show that, at the given position and height, this development would not infringe the safeguarding surfaces for **Dundee Airport.**

Therefore, Dundee Airport Limited has no objections to the proposal.

Anne Phillips
Operations Manager
on behalf of Dundee Airport Limited
c/o Highlands and Islands Airports Limited
Head Office, Inverness Airport, Inverness IV2 7JB
☏ 01667 464244 (DIRECT DIAL)
✉ safeguarding@hial.co.uk 🌎 www.hial.co.uk

AC7

MooreDJ

From: MooreDJ
Sent: 25 April 2014 09:27
To: MooreDJ
Subject: 14/00281/FULL

David Moore Clerical Officer Planning And Transport County Buildings Market Street Forfar DD8 3LG TEL 01307 473308 E Mail mooredj@angus.gov.uk

---

From: TG_ADMIN [mailto:TG_ADMIN@snh.gov.uk]
Sent: 22 April 2014 07:32
To: MooreDJ
Cc: TAYSIDE_GRAMPIAN
Subject: Erection of wind turbine of 40 metres to hub height and 67 metres to blade tip and ancillary development - At Field 200M North East Of Balnacake Farm – Aldbar – Brechin - 14/00281/FULL - below service statement response - 21 April 2014

Dear David,

Erection of wind turbine of 40 metres to hub height and 67 metres to blade tip and ancillary development - At Field 200M North East Of Balnacake Farm – Aldbar – Brechin - 14/00281/FULL – 21 April 2014

We do not intend to offer formal comment on this proposal as it falls below our threshold for consultation as outlined in our Service Statement for Planning and Development - http://www.snh.gov.uk/docs/A495949.pdf

Advice on small scale renewable energy proposals such as this can be at http://www.snh.gov.uk/docs/A669283.pdf

Kind regards,

Rebecca Anderson
Scottish Natural Heritage
Tayside & Grampian Area
Inverdee House
Baxter Street
Aberdeen
AB11 9QA

Sent on behalf of:

Isla Martin
Area Officer

From: MooreDJ [mailto:MooreDJ@angus.gov.uk]
Sent: 21 April 2014 11:41

WrightJ

From: AkroydL
Sent: 23 May 2014 09:49
To: WrightJ
Cc: ThomsonSD
Subject: 14/00281/FULL - Erection of Single Wind Turbine, Field 200m North East of Balnacake Farm, Aldbar, Brechin

James,

14/00281/FULL
Erection of Single Wind Turbine
Field 200m North East of Balnacake Farm, Aldbar, Brechin

I refer to the above application and can advise that I have seen the submitted information and have visited the site and have the following comments to a make;

Shadow Flicker

The submitted report states that one property known as Balnacake will be within 10 rotor diameters of the proposed turbine. A shadow flicker assessment has therefore been undertaken to assess the likely impact. The report states that flicker effects have been proven to occur only within ten rotor diameters of a turbine. This statement is a little misleading and I am not aware any research this proves this theory. It is my understanding that the 10 rotor diameter criteria should be used as a general rule only. Scottish Guidance for shadow flicker is available within PAN 45 Paragraph 64 which states that:

"It [shadow flicker] occurs only within buildings where the flicker appears through a narrow window opening. The seasonal duration of this effect can be calculated from the geometry of the machine and the latitude of the potential site. Where this could be a problem, developers should provide calculations to quantify the effect. In most cases however, where separation is provided between wind turbines and nearby dwellings (as a general rule 10 rotor diameters), "shadow flicker" should not be a problem."

The shadow flicker assessment undertaken has predicted that under worst case conditions the maximum duration the property at Balnacake could be affected by shadow flicker will be 26 minutes per day and no more than 14 hours per year. I would advise that while Balnacake is the closest property to the turbine there is potential for other properties outwith the 10 rotor diameter to be affected by shadow flicker based on the location of surrounding properties and I would therefore advise that all properties within a 1 km radius need to be included in the shadow flicker assessment.

Noise

The noise prediction calculations have been based on manufacturer's noise data dated the 7 December 2011, which state that they are warranted by the manufacturer and quote a sound power level of 100.5 at 10m/s which includes uncertainty but give no other details. This report also states that third octave sound power levels are available on request, however I note in the report produced by Atmos that the octave band data for the EWT DW54-500kW turbine is not warranted but has been standardised to the warranted broadband SWL supplied by the manufacturer.

I am aware of two other manufacturer's noise data reports for this turbine both of which quote higher sound power levels and include octave band data, the most recent being dated 9 May

2012. This report does not state that the data is warranted but that measurements were done in accordance with IEC 64100-11 and include octave band data, tonality assessment and provide details of measurement uncertainty. Based on the guidance issued by the IOA May 2013 and data available for this turbine I would advise that noise prediction calculations should be based on the latest report dated 9 May 2012 and include measurement uncertainty (1.645σ). I would therefore request that revised calculations are submitted.

The noise prediction calculations have been produced using the CadnaA noise software. Where any type of noise calculator is used a detailed explanation of the formulae applied and data inputted should be provided to demonstrate that the calculations follow guidance issued in the IOA - A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (May 2013). I would therefore request that screen shots of the noise model be submitted to clearly show the data inputted and to demonstrate how the noise prediction calculations have been derived.

Once the above information has been submitted, I will be able to comment further.

Regards

Louise Akroyd | Environmental Health Officer | Angus Council | Communities | Regulatory Protective & Prevention Services | County Buildings, Market Street, Forfar, DD8 3WE, Tel: (01307) 473382

WrightJ

From: AkroydL
Sent: 01 July 2014 17:00
To: WrightJ
Cc: ThomsonSD
Subject: 14/00281/FULL - Erection of Single Wind Turbine, Field 200m North East of Balnacake Farm, Aldbar, Brechin

James,

14/00281/FULL
Erection of Single Wind Turbine
Field 200m North East of Balnacake Farm, Aldbar, Brechin

I refer to the additional information submitted on noise and shadow flicker and have the following comments to make:

Shadow Flicker

In response to the additional comments and quotes from the Planning for Renewable Energy: A Companion Guide to PPS 22 (2004) which is guidance issued in England, I would advise that a report was published by the Department of Energy and Climate Change "Update of UK Shadow Flicker Evidence Base" - 16 March 2011. The aim of the report was to present an update of the evidence base which was produced by carrying out a thorough review of international guidance on shadow flicker, an academic literature review and by investigating current assessment methodologies employed by developers and case study evidence.

The report highlighted that while the 10 rotor diameter rule is deemed to be an appropriate assessment area, there is potentially a need to differentiate between appropriate assessment areas at different latitudes. I would also advise that this department has witnessed first hand that properties further away than 10 rotor diameters can be affected by shadow flicker and that it is not always the case that the properties closest to the turbine will be the ones most affected, as this is ultimately dependant on how close the property is from the shadow zone i.e. the direction the property is in relation to the sun.

I have, however, reviewed the revised shadow flicker assessment and am satisfied that shadow flicker could be adequately controlled by the use of a planning condition being attached to the consent.

Noise

I have looked at the additional information submitted and can advise that I am satisfied with the explanation given for the use of the manufacturers data in the assessment.

In light of the above I would advise that this department would not object to this application subject to the following conditions:

1. The rating level of noise immissions from the wind turbine (including the application of any tonal penalty) when determined in accordance with the attached Guidance Notes (to this condition), shall not exceed at any property lawfully existing at the date of this planning permission:

   L_{A90} 35dB (A) at wind speeds up to 10 m/s at 10m height at any other location.

2. Prior to the commencement of development the make and model of the turbine selected for use in the development shall be submitted for the written approval of the Planning Authority. In the event that any turbine other than the candidate turbine is selected for use the developers submission shall be accompanied by any supporting information considered necessary by the Planning Authority. Once approved all turbines shall be operated and maintained in accordance with the approved specification.

3. The wind turbine operator shall continuously log power production, wind speed and wind direction, all in accordance with Guidance Note 1(d). This data shall be retained for a period of not less than 24 months. The wind turbine operator shall provide this information in the format set out in Guidance Note 1(e) to the Local Planning Authority on its request, within 14 days of receipt in writing of such a request.

4. No electricity shall be exported until the wind turbine operator has submitted to the Local Planning Authority for written approval a list of proposed independent consultants who may undertake noise compliance measurements in accordance with this permission. Amendments to the list of approved consultants shall be made only with the prior written approval of the Local Planning Authority.

5. Within 21 days from receipt of a written request from the Local Planning Authority following a complaint to it from an occupant of a dwelling alleging noise disturbance at that dwelling, the wind turbine operator shall, at its expense, employ a consultant approved by the Local Planning Authority to assess the level of noise immissions from the wind turbine at the complainant's property in accordance with the procedures described in the attached Guidance Notes. The written request from the Local Planning Authority shall set out at least the date, time and location that the complaint relates to and any identified atmospheric conditions, including wind direction, and include a statement as to whether, in the opinion of the Local Planning Authority, the noise giving rise to the complaint contains or is likely to contain a tonal component.

6. The assessment of the rating level of noise immissions shall be undertaken in accordance with an assessment protocol that shall previously have been submitted to and approved in writing by the Local Planning Authority. The protocol shall include the proposed measurement location identified in accordance with the Guidance Notes where measurements for compliance checking purposes shall be undertaken, whether noise giving rise to the complaint contains or is likely to contain a tonal component, and also the range of meteorological and operational conditions (which shall include the range of wind speeds, wind directions, power generation and times of day) to determine the assessment of rating level of noise immissions. The proposed range of conditions shall be those which prevailed during times when the complainant alleges there was disturbance due to noise, having regard to the written request by the Local Planning Authority to investigate a complaint, and such others as the independent consultant considers likely to result in a breach of the noise limits.

7. The wind turbine operator shall provide to the Local Planning Authority the independent consultant's assessment of the rating level of noise immissions undertaken in accordance with the Guidance Notes within 2 months of the date of the written request of the Local Planning Authority for compliance measurements to be undertaken, unless the time limit is extended in writing by the Local Planning Authority. The assessment shall include all data collected for the purposes of undertaking the compliance measurements, such data to be provided in the format set out in Guidance Note 1(e) of the Guidance Notes. The instrumentation used to undertake the measurements shall be calibrated in accordance with Guidance Note 1(a) and

certificates of calibration shall be submitted to the Local Planning Authority with the independent consultant's assessment of the rating level of noise immissions.

8. Where a further assessment of the rating level of noise immissions from the wind turbine is required pursuant to Guidance Note 4(c), the wind turbine operator shall submit a copy of the further assessment within 21 days of submission of the independent consultant's assessment pursuant to condition 8 above unless the time limit has been extended in writing by the Local Planning Authority.

9. Prior to the commencement of development a mitigation scheme to address any impacts caused by shadow flicker shall be submitted for the written approval of the Planning Authority. Once approved the operation of the wind farm shall take place in accordance with the scheme unless the Planning Authority gives written consent to any variation. For the avoidance of doubt the mitigation scheme shall apply to all sensitive receptors including all residential properties and office buildings within 10 rotor diameters of a turbine.

10. That in the event of a pollution incident or interruption to supply, caused by the wind farm development, affecting or likely to affect any private water supply, the wind turbine operator shall provide an immediate temporary supply to those affected until permanent mitigation can be effected to the satisfaction of the Planning Authority. Any replacement supply shall be of a quality to meet the private water supplies (Scotland) Regulations 1992 or any other appropriate Regulation in force at the time. In any case a permanent replacement supply or mitigation measures shall be provided no later than one month after the supply is first affected.

Guidance Notes for Noise Conditions
These notes are to be read with and form part of the noise condition. They further explain the condition and specify the methods to be employed in the assessment of complaints about noise immissions from the wind farm. The rating level at each integer wind speed is the arithmetic sum of the wind farm noise level as determined from the best-fit curve described in Guidance Note 2 of these Guidance Notes and any tonal penalty applied in accordance with Guidance Note 3. Reference to ETSU-R-97 refers to the publication entitled "The Assessment and Rating of Noise from Wind Farms" (1997) published by the Energy Technology Support Unit (ETSU) for the Department of Trade and Industry (DTI).

Guidance Note 1

(a) Values of the LA90,10 minute noise statistic should be measured at the complainant's property using a sound level meter of EN 60651/BS EN 60804 Type 1, or BS EN 61672 Class 1 quality (or the equivalent UK adopted standard in force at the time of the measurements) set to measure using the fast time weighted response as specified in BS EN 60651/BS EN 60804 or BS EN 61672-1 (or the equivalent UK adopted standard in force at the time of the measurements). This should be calibrated in accordance with the procedure specified in BS 4142: 1997 (or the equivalent UK adopted standard in force at the time of the measurements). Measurements shall be undertaken in such a manner to enable a tonal penalty to be applied in accordance with Guidance Note 3.

(b) The microphone should be mounted at 1.2 – 1.5 metres above ground level, fitted with a two-layer windshield or suitable equivalent approved in writing by the Local Planning Authority, and placed outside the complainant's dwelling. Measurements should be made in "free field" conditions. To achieve this, the microphone should be placed at least 3.5 metres away from the building facade or any reflecting surface except the ground at the approved measurement location. In the event that the consent of the complainant for access to his or her property to undertake compliance measurements is withheld, the wind farm operator shall submit for the written approval of the Local Planning Authority details of the proposed alternative representative

measurement location prior to the commencement of measurements and the measurements shall be undertaken at the approved alternative representative measurement location.

(c) The LA90,10 minute measurements should be synchronised with measurements of the 10-minute arithmetic mean wind and operational data logged in accordance with Guidance Note 1(d), including the power generation data from the turbine control systems of the wind farm.

(d) To enable compliance with the conditions to be evaluated, the wind farm operator shall continuously log arithmetic mean wind speed in metres per second and wind direction in degrees from north at hub height for each turbine and arithmetic mean power generated by each turbine, all in successive 10-minute periods. Unless an alternative procedure is previously agreed in writing with the Planning Authority, this hub height wind speed, averaged across all operating wind turbines, shall be used as the basis for the analysis. All 10 minute arithmetic average mean wind speed data measured at hub height shall be 'standardised' to a reference height of 10 metres as described in ETSU-R-97 at page 120 using a reference roughness length of 0.05 metres . It is this standardised 10 metre height wind speed data, which is correlated with the noise measurements determined as valid in accordance with Guidance Note 2, such correlation to be undertaken in the manner described in Guidance Note 2. All 10-minute periods shall commence on the hour and in 10- minute increments thereafter.

(e) Data provided to the Local Planning Authority in accordance with the noise condition shall be provided in comma separated values in electronic format.

(f) A data logging rain gauge shall be installed in the course of the assessment of the levels of noise immissions. The gauge shall record over successive 10-minute periods synchronised with the periods of data recorded in accordance with Note 1(d).

Guidance Note 2

(a) The noise measurements shall be made so as to provide not less than 20 valid data points as defined in Guidance Note 2 (b)

(b) Valid data points are those measured in the conditions specified in the agreed written assessment protocol, but excluding any periods of rainfall measured in the vicinity of the sound level meter. Rainfall shall be assessed by use of a rain gauge that shall log the occurrence of rainfall in each 10 minute period concurrent with the measurement periods set out in Guidance Note 1. In specifying such conditions the Local Planning Authority shall have regard to those conditions which prevailed during times when the complainant alleges there was disturbance due to noise or which are considered likely to result in a breach of the limits.

(c) For those data points considered valid in accordance with Guidance Note 2(b), values of the LA90,10 minute noise measurements and corresponding values of the 10- minute wind speed, as derived from the standardised ten metre height wind speed averaged across all operating wind turbines using the procedure specified in Guidance Note 1(d), shall be plotted on an XY chart with noise level on the Y-axis and the standardised mean wind speed on the X-axis. A least squares, "best fit" curve of an order deemed appropriate by the independent consultant (but which may not be higher than a fourth order) should be fitted to the data points and define the wind farm noise level at each integer speed.

Guidance Note 3

(a) Where, in accordance with the approved assessment protocol, noise immissions at the location or locations where compliance measurements are being undertaken contain or are likely to contain a tonal component, a tonal penalty is to be calculated and applied using the following rating procedure.

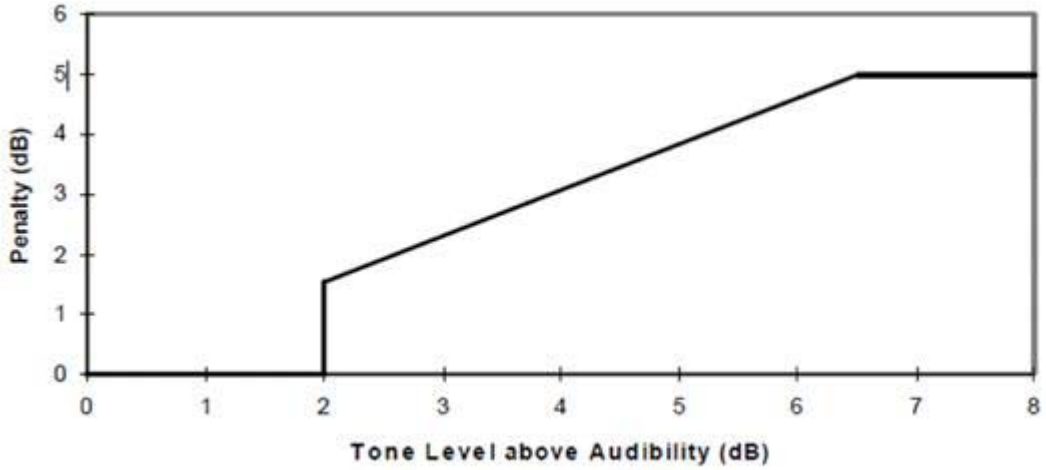
(b) For each 10 minute interval for which LA90,10 minute data have been determined as valid in accordance with Guidance Note 2 a tonal assessment shall be performed on noise immissions during 2 minutes of each 10 minute period. The 2 minute periods should be spaced at 10 minute intervals provided that uninterrupted uncorrupted data are available ("the standard procedure") Where uncorrupted data are not available, the first available uninterrupted clean 2 minute period out of the affected overall 10 minute period shall be selected. Any such deviations from the standard procedure, as described in Section 2.1 on pages 104-109 of ETSU-R-97, shall be reported.

(c) For each of the 2 minute samples the tone level above or below audibility shall be calculated by comparison with the audibility criterion given in Section 2.1 on pages 104-109 of ETSU-R-97.

(d) The tone level above audibility shall be plotted against wind speed for each of the 2 minute samples. Samples for which the tones were below the audibility criterion or no tone was identified, a value of zero audibility shall be used.

(e) A least squares "best fit" linear regression line shall then be performed to establish the average tone level above audibility for each integer wind speed derived from the value of the "best fit" line at each integer wind speed. If there is no apparent trend with wind speed then a simple arithmetic mean shall be used. This process shall be repeated for each integer wind speed for which there is an assessment of overall levels in Guidance Note 2.

(f) The tonal penalty is derived from the margin above audibility of the tone according to the figure below.



Guidance Note 4

(a) If a tonal penalty is to be applied in accordance with Guidance Note 3 the rating level of the turbine noise at each wind speed is the arithmetic sum of the measured noise level as determined from the best fit curve described in Guidance Note 2 and the penalty for tonal noise as derived in accordance with Guidance Note 3 at each integer wind speed within the range specified by the agreed written assessment protocol.

(b) If no tonal penalty is to be applied then the rating level of the turbine noise at each wind speed is equal to the measured noise level as determined from the best fit curve described in Guidance Note 2.

(c) In the event that the rating level is above the limit(s) set out in the Tables attached to the noise conditions or the noise limits for a complainant's dwelling, the independent consultant shall undertake a further assessment of the rating level to correct for background noise so that the rating level relates to wind turbine noise immission only.

(d) The wind farm operator shall ensure that all the wind turbines in the development are turned off for such period as the independent consultant requires to undertake the further assessment. The further assessment shall be undertaken in accordance with the following steps:

(e). Repeating the steps in Guidance Note 2, with the wind farm switched off, and determining the background noise (L3) at each integer wind speed within the range requested by the Local Planning Authority in its written request and the approved protocol.

(f) The wind farm noise (L1) at this speed shall then be calculated as follows where L2 is the measured level with turbines running but without the addition of any tonal penalty:

$$L_1 = 10 \log\left[10^{L_2/10} - 10^{L_3/10}\right]$$

(g) The rating level shall be re-calculated by adding arithmetically the tonal penalty (if any is applied in accordance with Note 3) to the derived wind farm noise L1 at that integer wind speed.

(h) If the rating level after adjustment for background noise contribution and adjustment for tonal penalty (if required in accordance with note 3 above) at any integer wind speed lies at or below the values set out in the Tables attached to the conditions or at or below the noise limits approved by the Local Planning Authority for a complainant's dwelling then no further action is necessary. If the rating level at any integer wind speed exceeds the values set out in the Tables attached to the conditions or the noise limits approved by the Local Planning Authority for a complainant's dwelling then the development fails to comply with the conditions.

If you have any queries about the above please let me know

Regards

Louise Akroyd | Environmental Health Officer | Angus Council | Communities | Regulatory Protective & Prevention Services | County Buildings, Market Street, Forfar, DD8 3WE, Tel: (01307) 473382

From: WrightJ
Sent: 13 June 2014 15:55
To: AkroydL
Subject: FW: 14/00281/FULL - Response to EHO's Noise comments

Hi Louise,

Details attached as per my last e-mail.

James

From: WrightJ
Sent: 13 June 2014 15:54
To: AkroydL
Subject: FW: 14/00281/FULL - Erection of Single Wind Turbine, Field 200m North East of Balnacake Farm, Aldbar, Brechin

AC9

CaneyV

From: MooreDJ
Sent: 13 May 2014 09:31
To: CaneyV
Subject: FW: E Consulataion

David Moore Clerical Officer Planning And Transport County Buildings Market Street Forfar DD8 3LG TEL 01307 473308 E Mail mooredj@angus.gov.uk

---

From: Windfarms [mailto:Windfarms.Windfarms@caa.co.uk]
Sent: 13 May 2014 09:28
To: MooreDJ
Cc: PLNProcessing
Subject: RE: E Consulataion

Dear Sir/Madam

Request for Comment under the Town and Country Planning Act 1990 and the Town and Country Planning (Scotland) Act 1997

There is currently a high demand for CAA comment on wind turbine applications which exceeds the capacity of the available resource to respond to requests within the timescales required by Local Planning Authorities. The CAA has no responsibilities for safeguarding sites other than its own property, and a consultation by a Council is taken as a request for clarification of procedural matters. Councils are reminded of their obligations to consult in accordance with ODPM/DfT Circular 1/2003 or Scottish Government Circular 2/2003, and in particular to consult with NATS and the Ministry of Defence as well as any aerodromes listed in Annex 3 of the above documents, taking note of appropriate guidance and policy documentation. Should the Council be minded to grant consent to an application despite an objection from one of the bodies listed in the circular, then the requisite notifications should be made.

Whilst the CAA recommends all aerodrome operators/license holders develop associated safeguarding maps and lodge such maps with local planning authorities, the CAA additionally encourages councils/planning authorities to undertake relevant consultation with known local aerodromes regardless of status or the existence of any aerodrome/council safeguarding agreement, including local emergency service Air Support Units (e.g. Police Helicopter or Air Ambulance).

There is an international civil aviation requirement for all structures of 300 feet (91.4 metres)* or more to be charted on aeronautical charts. However, on behalf of other non-regulatory aviation stakeholders, in the interest of Aviation Safety, the CAA requests that any feature/structure 70 feet in height, or greater, above ground level is notified to the Defence Geographic Centre ICGDGC-ProdAISAFDb@mod.uk, including the location(s), height(s)* and lighting status of the feature/structure, the estimated and actual dates of construction and the maximum height of any construction equipment to be used, at least 6 weeks prior to the start of construction, to allow for the appropriate notification to the relevant aviation communities.

Any structure of 150 metres* or more must be lit in accordance with the Air Navigation Order and should be appropriately marked. Although if an aviation stakeholder (including the MOD) made a request for lighting it is highly likely that the CAA would support such a request, particularly if the request falls under Section 47 of the Aviation Act.

Cumulative effects of turbines may lead to unacceptable impacts in certain geographic areas.

The Ministry of Defence will advise on all matters affecting military aviation.

Should the Council still have a specific query about a particular aspect of this application the CAA will help in the clarification of aviation matters and regulatory requirements. Site operators remain

responsible for providing expert testimony as to any impact on their operations and the lack of a statement of objection or support from the CAA should not be taken to mean that there are no aviation issues, or that a comment from an operator lacks weight.

Guidance relating to the impact of wind turbines upon aviation can be found at http://www.caa.co.uk/docs/33/Cap764.pdf. More generic comment relating to the CAA involvement in the planning process is described at http://www.caa.co.uk/docs/33/DAP_GuidanceOnCAAPlanningConsultationRequirements.pdf.

Yours Faithfully

Kelly Lightowler
K LIGHTOWLER
Squadron Leader (RAF)
Surveillance and Spectrum Management
Directorate of Airspace Policy
Civil Aviation Authority
45-59 Kingsway London WC2B 6TE
Tel: 020 7453 6534 Fax: 020 7453 6565
windfarms@caa.co.uk

*The effective height of a wind turbine is the maximum height to blade tip.

From: MooreDJ [mailto:MooreDJ@angus.gov.uk]
Sent: 21 April 2014 11:41
To: NATSsafeguarding@nats.co.uk; Safeguarding@hial.co.uk; TAYSIDE_GRAMPIAN@SNH.GOV.UK; Windfarms; esro@rspb.org.uk; Spectrum.LicensingEnquiries@ofcom.org.uk; windfarms@atkinsglobal.com; windfarms@jrc.co.uk; archaeology@aberdeenshire.gov.uk; hs.heritagemanagement@scotland.gsi.gov.uk
Subject: E Consulataion

14/00281/FULL
Erection of wind turbine of 40 metres to hub height and 67 metres to blade tip and ancillary development
At Field 200M North East Of Balnacake Farm
Aldbar
Brechin

David Moore Clerical Officer Planning And Transport County Buildings Market Street Forfar DD8 3LG
TEL 01307 473308 E Mail mooredj@angus.gov.uk

AC10

LeslieIA

From: Lennon, Jenny [Jenny.Lennon@rspb.org.uk]
Sent: 05 May 2014 14:28
To: PLNProcessing
Subject: Balnacake Farm Aldbar Brechin 14/00281/FULL

FAO James Wright

Thankyou for consulting RSPB Scotland on this application. We have no specific comments on this proposal in isolation but would like to highlight the issue of cumulative impact on birds. Currently there are several proposals for wind turbines in this general area, within 20km of Montrose Basin, in addition to the already operational turbines in the wider landscape. Therefore, we would suggest that post-construction monitoring linked to some form of cumulative impact assessment should be carried out to assist our understanding of the potential issues connected to an increased number of turbines on birds. This in turn would better inform our responses to such proposals. SNH have produced guidance on assessing the cumulative impact on birds, which can be found at:
http://www.snh.gov.uk/docs/A675503.pdf

Regards

Jenny Lennon

Conservation Officer
RSPB Scotland

AC11

MooreDJ

From: Spectrum Licensing [Spectrum.Licensing@ofcom.org.uk]
Sent: 03 May 2014 15:26
To: MooreDJ
Cc: 'windfarms@jrc.co.uk'; 'windfarms@atkinsglobal.com'
Subject: RE: E Consulataion

Search Radius 0m at Centre NGR NO5616157679. Search includes

Links	*Company*
0938367/1	Mobile Broadband Network Limited as Agent of Everything Everywhere and Hutch

These details are provided to Ofcom by Fixed Link operators at the time of their licence application and cannot verified by Ofcom for accuracy or currency and Ofcom makes no guarantees for the currency or accuracy of information or that they are error free. As such, Ofcom cannot accept liability for any inaccuracies or omissions in the data provided, or its currency however so arising. The information is provided without any representation or endorsement made and without warranty of any kind, whether express or implied, including but not limited to the implied warranties of satisfactory quality, fitness for a particular purpose, non-infringement, compatibility, security and accuracy.

Our response to your co-ordination request is only in respect of microwave fixed links managed and assigned by Ofcom within the bands and frequency ranges specified in the table below. The analysis identifies all fixed links with either one link leg in the coordination range or those which intercept with the coordination range. The coordination range is a circle centred on your provided national grid reference. We add an additional 500 metres to the coordination range that you request. Therefore if you have specified 500 metres the coordination range will be 1km.

If you should need further information regarding link deployments and their operation then you will need to contact the fixed link operator(s) identified in the table above directly.

Additional coordination is also necessary with the band managers for the water, electricity and utilities industries which operate in the frequency ranges 457-458 MHz paired with 463-464 MHz band. You should contact both the following:

- Atkins Ltd at windfarms@atkinsglobal.com.
- Joint Radio Company (JRC) at windfarms@jrc.co.uk. Additionally, you can call the JRC Wind Farm Team on 020 7706 5197.

For self coordinated links operating in the 64-66GHz, 71-76GHz and 81-86GHz bands a list of current links can be found at: http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/fixed/

Regarding assessment with respect to TV reception, the BBC has an online tool available on their website: http://www.bbc.co.uk/reception/info/windfarm_tool.shtml . Ofcom do not forward enquiries to the BBC.

Please note other organisations may require coordination with regard to your request. More information regarding windfarm planning is available on the British Wind Energy Association website www.bwea.com .

Table of assessed fixed links bands and frequency ranges

Band (GHz)	Frequency Range (MHz)
1.4/1.5	1350 -1375 1450 -1452 1492 -1530
1.6	1672 – 1690
1.7	1764 – 1900
2	1900 – 2690
4	3600 – 4200
6	5925 – 7110
7.5	7425 – 7900

11	10700 – 11700
13	12750 – 13250
14	14250 – 14620
15	14650 – 15350
18	17300 – 19700
22	22000 – 23600
25	24500 – 26500
28	27500 – 29500
38	37000 – 39500
50	49200 – 50200
55	55780 – 57000

Regards

Duty Engineering Officer
Spectrum Management Centre
Spectrum Operations
Email: deo@ofcom.org.uk

:: Ofcom
Radio Monitoring Station
Royston Road
Baldock
Hertfordshire
SG7 6SH
www.ofcom.org.uk

From: MooreDJ [mailto:MooreDJ@angus.gov.uk]
Sent: 21 April 2014 11:41
To: NATSsafeguarding@nats.co.uk; Safeguarding@hial.co.uk; TAYSIDE_GRAMPIAN@SNH.GOV.UK; windfarms@caa.co.uk; esro@rspb.org.uk; Spectrum Licensing; windfarms@atkinsglobal.com; windfarms@jrc.co.uk; archaeology@aberdeenshire.gov.uk; hs.heritagemanagement@scotland.gsi.gov.uk
Subject: E Consulataion

14/00281/FULL
Erection of wind turbine of 40 metres to hub height and 67 metres to blade tip and ancillary development
At Field 200M North East Of Balnacake Farm
Aldbar
Brechin

David Moore Clerical Officer Planning And Transport County Buildings Market Street Forfar DD8 3LG
TEL 01307 473308 E Mail mooredj@angus.gov.uk

****

AC12

LeslieIA

From: Windfarms [windfarms@atkinsglobal.com]
Sent: 22 April 2014 07:03
To: PLNProcessing
Subject: WF 27434 - 14/00281/FULL - 200M North East Of Balnacake Farm - NO 56161 57679

Dear Sirs,

I am responding to an email of 21-Apr-14, regarding the above named proposed development.

The above application has now been examined in relation to UHF Radio Scanning Telemetry communications used by our Client in that region and we are happy to inform you that we have **NO OBJECTION** to your proposal.

Please note that this is not in relation to any Microwave Links operated by Scottish Water

Atkins Limited is responsible for providing Wind Farm/Turbine support services to the Telecommunications Association of the UK Water Industry (TAUWI).

Atkins Limited is responsible for providing Wind Farm/Turbine support services to the Telecommunications Association of the UK Water Industry. Web: www.tauwi.co.uk

Windfarm Support
ATKINS
The official engineering design services provider
for the London 2012 Olympic and Paralympic Games
Web: www.atkinsglobal.com/communications

MooreDJ

From: Windfarms Team [windfarms@jrc.co.uk]
Sent: 25 April 2014 16:13
To: MooreDJ
Subject: Planning Ref: 14/00281/FULL -- Balnacake Farm, Aldbar, Brechin -- Proposed Wind Turbine

Dear Sir/Madam,

Planning Ref: 14/00281/FULL

Name/Location: Balnacake Farm

Turbine at NGR/IGR: 356161 757678

Hub Height: 40m Rotor Radius: 27m

(defaults used if not specified on application)

Cleared with respect to radio link infrastructure operated by:-

Local Electricity Utility and Scotia Gas Networks

JRC analyses proposals for wind farms etc. on behalf of the UK Fuel & Power Industry and the Water Industry in north-west England. This is to assess their potential to interfere with radio systems operated by utility companies in support of their regulatory operational requirements.

In the case of this proposed wind energy development, JRC does not foresee any potential problems based on known interference scenarios and the data you have provided. However, if any details of the wind farm change, particularly the disposition or scale of any turbine(s), it will be necessary to re-evaluate the proposal.

In making this judgement, JRC has used its best endeavours with the available data, although we recognise that there may be effects which are as yet unknown or inadequately predicted.JRC cannot therefore be held liable if subsequently problems arise that we have not predicted.

It should be noted that this clearance pertains only to the date of its issue. As the use of the spectrum is dynamic, the use of the band is changing on an ongoing basis and consequently, developers are advised to seek re-coordination prior to considering any design changes.

Regards

Keith Brogden

Wind Farm Team

The Joint Radio Company Limited
Dean Bradley House,
52 Horseferry Road,
LONDON SW1P 2AF
United Kingdom

DDI: +44 20 7706 5197
TEL: +44 20 7706 5199
Skype: keithb_jrc

<windfarms@jrc.co.uk>

MooreDJ

From: Bruce.Mann@aberdeenshire.gov.uk
Sent: 23 April 2014 11:41
To: MooreDJ
Subject: Planning Application 14/00281/FULL - Archaeology Comments

Planning Application: 14/00281/FULL
Proposal: Erection of wind turbine of 40 metres to hub height and 67 metres to blade tip and ancillary development
Location: At Field 200M North East Of Balnacake Farm Planning Officer: David Moore

Thank you for consulting the Archaeology Service with regard to the above development proposal. Having taken into consideration the nature and location of the development I can confirm that, in this particular instance, no archaeological mitigation is required.

Should either yourself or the Applicant have any queries regarding the above then please do not hesitate to contact me.

Best wishes
Bruce

Bruce Mann MA MIFA FSA Scot
Archaeologist
Infrastructure Services
Aberdeenshire Council

Tel: 01224 664731 Internal 725 4731
Fax: 01224 664679
Web Site - www.aberdeenshire.gov.uk/archaeology

Archaeology Service for Aberdeenshire, Moray & Angus Councils

AC15

Angus Council

Memorandum

Communities
(Roads)

TO: HEAD OF PLANNING & PLACE

FROM: HEAD OF TECHNICAL & PROPERTY SERVICES

YOUR REF:

OUR REF: GH/AG/SC TD1.3

DATE: 12 MAY 2014

SUBJECT: PLANNING APPLICATION REF. NO. 14/00281/FULL – PROPOSED 67m WIND TURBINE AT NETHERTON FOR POLAR ENERGY (NETHERTON) LTD

I refer to the above planning application.

The site is located on the Land to the south of the B9134 Forfar to Brechin Road on land at Netherton. Access is from the B9113 which is subject to the national speed limit.

An environmental appraisal has been submitted which suggests the route that the wind turbine is to travel from the Port of Dundee to the final site via A90(T), A932 and B9134.

I have considered the application in terms of the traffic likely to be generated by it, and its impact on the public road network. As a result, I do not object to the application but would recommend that any consent granted shall be subject to the following conditions:

1 That, prior to the commencement of development, visibility splays shall be provided at the junction of the proposed access with B9134 Forfar to Brechin Road giving a minimum sight distance of 214 metres in each direction, at a point 2.4 metres from the nearside channel line of B9134 Forfar to Brechin Road.
Reason: to ensure a safe and suitable access, in the interests of road safety.

2 That, within the above visibility splays nothing shall be erected, or planting permitted to grow to a height in excess of 1050mm above the adjacent road channel level.
Reason: to provide and maintain adequate sightlines, in the interests of road safety.

3 That, prior to the commissioning or use of the turbine, the verge crossing at the proposed access shall be improved to form a new bellmouth junction with kerbed radii of 6 metres and a minimum throat width of 5.5 metres. The verge crossing shall be constructed in accordance with the Angus Council Road Standards (Type C).
Reason: to provide a safe and satisfactory access in a timely manner.

4 *That, prior to the commissioning or use of the turbine, the running surface of the existing access track shall be surfaced for 15 metres from its junction with the public road.*
Reason: to provide a safe and satisfactory standard of access and adequate level of residential amenity.

5 *That, the access shall be designed so as to prevent the discharge of surface water onto the public road.*
Reason: in the interests of road safety.

6 That, prior to the commencement of development, a Construction Traffic Management and Routing Plan shall be submitted for the written approval of the Planning Authority. Thereafter, the development shall be undertaken in accordance with the approved details of the plan. The Construction Traffic Management and Routing Plan shall consider arrangements for the following:

(i) agreement with the Roads Authority on the routing for abnormal loads;

(ii) the type and volume of vehicles to be utilised in the delivery to the site of construction materials and turbine components associated with the construction and erection of the wind turbines;

(iii) assessment of the suitability of the proposed routes, including bridge capacities, to accommodate the type and volume of traffic to be generated by the development. The assessment shall include details of swept path analyses and include DVD video route surveys;

(iv) any proposed accommodation works / mitigating measures affecting the public roads in order to allow for delivery loads including carriageway widening, junction alterations, associated drainage works, protection to public utilities, temporary or permanent traffic management signing, and temporary relocation or removal of other items of street furniture;

(v) the restriction of delivery traffic to agreed routes;

(vi) the timing of construction traffic to minimise impacts on local communities, particularly at school start and finish times, during refuse collection, at weekends and during community events;

(vii) a code of conduct for HGV drivers to allow for queuing traffic to pass;

(viii) liaison with the roads authority regarding winter maintenance;

(ix) contingency procedures, including names and telephone numbers of persons responsible, for dealing with vehicle breakdowns;

(x) a dust and dirt management strategy, including sheeting and wheel cleaning prior to departure from the site;

(xi) the location, design, erection and maintenance of warning/information signs for the duration of the works, at site accesses and crossovers on private haul roads or tracks used by construction traffic and pedestrians, cyclists or equestrians;

(xii) contingencies for unobstructed access for emergency services;

(xiii) co-ordination with other major commercial users of the public roads on the agreed routes in the vicinity of the site;

(xiv) traffic management, in the vicinity of temporary construction compounds;

(xv) the provision of data from traffic counters, installed at locations and at intervals to be agreed with the Roads Authority, at the applicant's expense;

(xvi) arrangements for the monitoring, reviewing and reporting on the implementation of the approved plan; and

(xvii) procedures for dealing with non-compliance with the approved plan.

Reason: in the interests of road safety and to ensure the free flow of traffic for the convenience of road users and to ensure that any works required to the local road network to facilitate the development are undertaken.

The application affects the A90(T) Dundee to Aberdeen trunk road and should be referred to Transport Scotland.

I trust the above comments are of assistance but should you have any further queries, please contact Adrian Gwynne on extension 3393.

[redacted]

AC16

HISTORIC SCOTLAND
ALBA AOSMHOR

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Direct Line: 0131 668 8688
Switchboard: 0131 668 8600
Victoria.Clements@scotland.gsi.gov.uk

Our ref: AMH/6358/10
Our Case ID: 201400422
Your ref: 14/00281/FULL

30 April 2014

Sent by e-mail: PLNProcessing@angus.gov.uk

Planning & Transport Division
Angus Council
County Buildings
Market Street
FORFAR
DD8 3LG

Dear Sirs

Town And Country Planning (Development Management Procedure) (Scotland) Regulations 2013
Erection of wind turbine (40m to hub height and 67m to blade tip) and ancillary development, Field 200m North East of Balnacake Farm, Aldbar, Brechin Broomknowe,enclosure 200m W of

Thank you for your consultation dated 22 April which we received on the same date.

We have considered your consultation and have no comments to make on the proposals. We confirm that your Council should proceed to determine the application without further reference to us.

Yours faithfully

VICTORIA CLEMENTS
Heritage Management Officer East

18th August 2014

14/00281/FULL Erection of a Single Wind Turbine North East Of Balnacake Farm, Aldbar, Brechin
Comments of the Planning Adviser (Landscape) on the Landscape and Visual Impacts of the Erection of a single 500kW Wind Turbine of 67m height to Blade tip, 54m Rotor Diameter and 40m Hub-height on a field 200m north-east of Balnacake Farm, Aldbar, Brechin

Landscape Impacts

The proposed turbine site is located within the LCA of Low Moorland Hills but near the intersection of Low Moorland Hill and Broad Valley Lowlands, northern part of Montreathmont Moor.

The Implementation Guide provides interpretation of the level of turbine development that a LCT is capable of absorbing. As an acceptable level of change of landscape character the future Wind Energy Landscape Type for this area has been defined as Landscape with Occasional Windfarms, with a capacity for turbines of up to 80m tip height.

The LCA is characterised by gently undulating farmland of a medium scale which is gently sloping towards the north-east and the Lowland Basin LCA. The north western edge is marked by a steep escarpment towards the valley of the South-Esk River. The large mature lowland forest of Montreathmont, which is dominated by coniferous planting, is a characteristic element of the northern part of the LCA whereas the southern part is characterised by the Forfar hills and their Hill forts.

The proposal is close to the landscape between Mains of Melgund and Mains of Aldbar, which is characterised by undulating fields, hedgerows, clumps of field trees and small patches of deciduous woodland along the two small watercourses which feed into the South Esk River. Around the proposed site the landscape feels open and exposed, with distant views opening over the Broadvalley Lowland to the north-west.

The proposal is located at the summit of a small hill which forms part of the steep escarpment between the Low Moorland hills and the South Esk River valley. The 67m tip-height turbine would be located in an exposed location above the River South Esk valley and the Broad valley Lowlands. The South Esk River Valley, which is bordering the area of the site and where the turbine would be clearly visible, is generally considered an area with no capacity for turbines of this size.

Although the northern part LCA of Low Moorland Hills is generally considered to have the capacity to accommodate medium-large and large turbines, the escarpment towards the South Esk River valley is not considered to have a capacity for turbines of this size. The location of larger turbines (such as medium-large to large) close to the escarpment over the river South Esk valley would risk dominating this small scale landform and the skyline of the Low Moorland Hills.

Visual Impacts

The site is located on a hill which forms the edge of the escarpment towards the Broad Valley Lowlands. Within the Low Moorland Hills LCA the main visual receptors at closer vicinity of this turbine would be minor roads, single properties and at further distance the viewpoint of Turin Hill. Generally the area is a less frequented area. Within the Broadvalley Lowlands there are more frequented roads such as the Forfar Brechin B9134 road and the A90 which would be affected by views of the turbine. There is also a higher concentration of properties which would be visual receptors, such as small settlements within the South Esk Valley and the town of Brechin.

Views from within the Low Moorland Hills are varied between the more contained and the more exposed areas within the undulating topography, with an increasing number of distant landscape

views opening towards the north-west over the Strathmoor Lowlands, the nearer the north-western edge of the LCA. The distant views over the Broad valley Lowlands would experience the addition of a prominent turbine in the foreground. This would affect scenic views from stretches minor roads to the south-east (represented in VP1) and south west of the site which are not highly frequented and a core-path along Burghill wood (represented in VP2).

From within the Broadvalley Lowlands the turbine would be seen prominently against the sky on the horizon, the visual effects in most places would be comparable to those represented in VP3 but without the screening of the woodland. From the outer edge of Brechin the turbine would be prominent on the southern skyline with scale effects on the silhouettes of the Low Moorland Hills, including Turin Hill (as represented in VP4).

Properties in the close vicinity would be Balnacake at 430m to the south-west, Broomknowe at 550m, a distance of 8 times turbine height to the north-east, Wandershiell at 560m, a distance of 8 times turbine height to the south, Walkend Cottage at 730m, a distance of more than 10 times turbine height to the east, and House View House, at 820m, a distance of 12 times turbine height to the south.

The property of Wandershiell faces over the valley to the south, away from the turbine and has a large amount of mature trees enclosing the property, with a large barn facing the turbine on the hill behind the property. Due to the size of the development it is expected to have some significant visual impact on the surroundings of the property, however the property seems very sheltered and screened in the direction of the turbine and no scenic distant views of interested would be obstructed by the turbine.

The property of House View at 820m distance faces south, however the gardens and rear windows would be likely to experience views of the turbine of possibly moderate to significant visual impact. The property is at 12 times turbine-height distance, there could be some visual impact on the amenity of the property, however the turbine would unlikely be a dominant focal point in the foreground or obstruct any views from the property.

The property of Broomknowe would possibly experience views of a large rotor from the rear of their property and some outfoor amenity spaces as the turbine would be placed on the hill behind the property, at an oblique angle. The turbine would possibly appear overwhelming in size similar to the illustration of VP9. However, scenic distant views face in the other direction over Strathmoor.

The turbine is likely to be visible in the area around Melgund Castle, where there are scenic landscape views over the Broad valley Lowlands. The turbine would also be likely to be visible from the settlement of Aberlemno and the Crosston standing Stones behind the screening of trees, however, from these locations the views of the most scenic quality face in the direction of the Strathmoor valley.

The proposed site is a widely visible and exposed location, the turbine would be seen against the skyline without back clothing from most viewpoints and be visually prominent in the surrounding area. In particular the views of the Low Moorland Hills skyline from within the Broadvalley Lowland would suffer skyline effects and the turbine would be a dominant visual focus on this landform. Within the Low Moorland Hills area, the exposed undulating landscape with glimpses of the distant valley have a scenic quality which would experience negative visual impact by the addition of a dominant focal point in the foreground.

Cumulative Landscape Impact

The Implementation Guide provides interpretation of the level of turbine development that a LCT is capable of absorbing. As an acceptable level of change of landscape character the future Wind Energy Landscape Type for this area has been defined as Landscape with Occasional Windfarms, with a capacity for turbines of up to 80m tip height.

The area is considered to have a low remaining capacity for medium-large turbines and a remaining medium capacity for medium sized and small turbines. Medium-large turbines should ideally be spaced between 5 and 10km and not exceed group numbers of 3 turbines, medium turbines should ideally be spaced at 3-6km.

At the present there is little wind energy development in the area, within the range of 5km there is one operational small-medium sized turbine of 20m tip-height at 3.1km at Melgund Muir. There are two pending applications for turbine developments within the range of 5km, one medium-large sized turbine of 67m tip-height at 3.9km to the east at East Drums Brechin and one medium-sized turbine of 45.9m tip-height at Bellahill Melgund at 4.1km to the south-west.

Relevantly sized turbines within the range of 7km are the medium-large sized 77m tip-height turbine at 5.5km to the south at Pickerton Guthrie, the medium-large sized 77m tip-height turbine at 6km to the north-west at Dunswood Menmuir Brechin.

Significant cumulative landscape impact arising from the proposed scheme in combination with any of the approved schemes would be unlikely.

If the proposed development for a medium-large sized turbine at East Drums Brechin at 3.9km distance to the east of the application site was to be approved, the turbines could be treated as a loose grouping, due to their similar location, turbine type and height and the fact that the two turbines would be seen in combination from most viewpoints at further distance. However spacing distances should ideally be smaller than the 3.9km to efficiently group landscape and visual impacts between two turbines of this size.

The two turbines would be placed at the same altitude (around 110m) and they would be of the same tip-height and a similar make. If both turbines were to be approved, the similarity of the two models should to be confirmed, as negative cumulative landscape impacts would arise from placing turbine types of varied appearance in a grouping.

Cumulative Visual Impact

If the medium-large turbine at East Drums Brechin was to be approved, the turbines would be seen in combination from most viewpoints around Brechin, within the Lowland Basin LCA to the east, the Broadvalley Lowlands LCA to the north and from viewpoints within the Low Moorland Hills LCA.

Due to a similar situation on the northern edge of the escarpment towards the River South Esk Valley and both of the sites' proximity to the Lowland Basin LCA, the turbines would appear next to each other when seen from most viewpoints within the Broadvalley Lowlands and the Lowland Basin LCA. The distance between the two sites should ideally be reduced to minimise the horizontal spread of the cumulative visual impacts. However, the proposed development would have significant landscape and visual impact, not only when seen in combination but also seen in isolation.

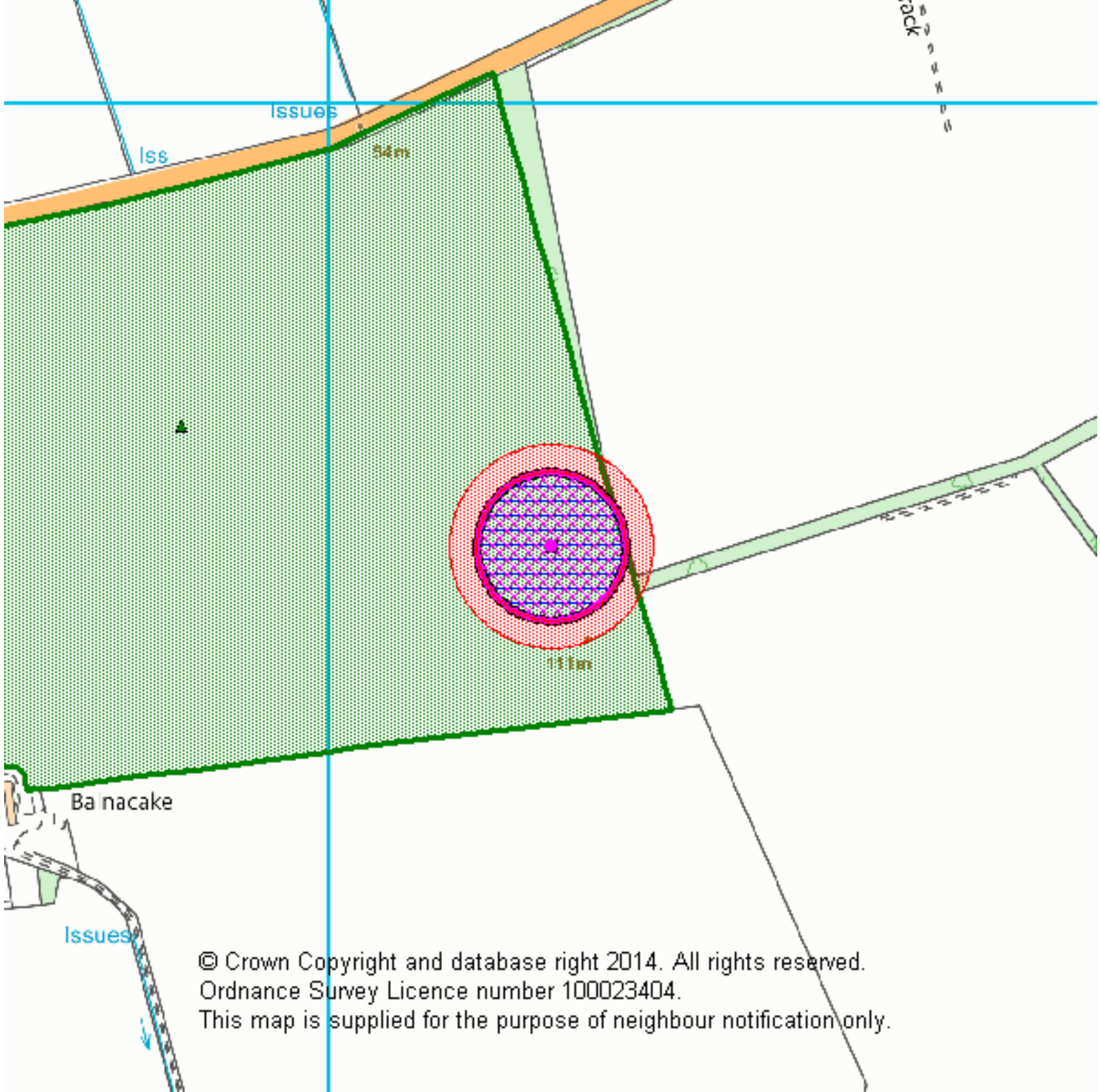
The turbine would likely be visible on the horizon within the view shed of the Lowland Basin LCA and add to the general accumulation of turbines seen around the horizon line in the distance within this area where views are extensive. However, significant cumulative visual impact arising from the proposed development in conjunction with other approved turbine developments would be unlikely.

Conclusion

Due to the exposed location of the site and it close vicinity to the escarpment slope above the River South Esk Valley, both visual and Landscape effects of the development would be significant. The scale of the proposed development would have adverse effects on the landforms of the low Moorland Hills and their northern escarpment. Although large areas of the low Moorland Hills can accommodate large to medium-large turbines, the escarpment is one of the most sensitive areas within the LCA.

For views from within Strathmoor, from Brechin and views from within the Low Moorland Hills the turbine would create a dominant visual focus with strong skyline effects and no back-clothing. The turbine would adversely affect several scenic landscape views over the South Esk River Valley from within the less frequented area of the Low Moorland Hills, and also skyline views of the Moorland Hills from receptors at further distance such as Brechin, with a high number of residents that would be exposed to these views of the turbine.

The turbine would have a cumulative relationship with the turbine at East Drums if the latter was consented, however the adverse visual and landscape effects would mainly arise from the development proposed at Balnacake, regardless of cumulative effects. However if the proposed turbine at Balnacake was consented, the advantages of grouping visual and landscape effects where they are already established would increase the chances for the development proposed at East Drums Farm to be considered favourably in terms of Landscape and Visual Impact.



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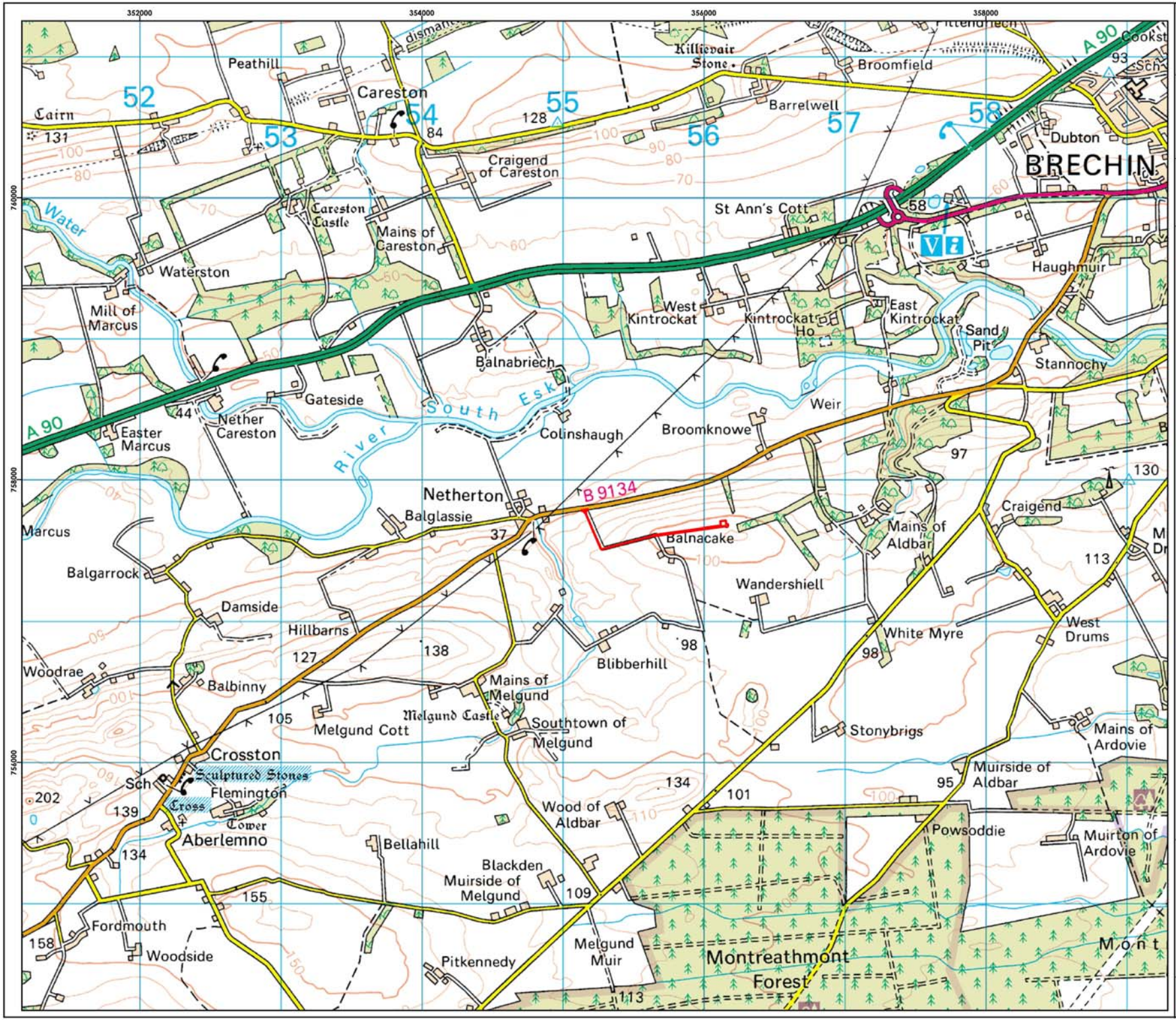


Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-2
Site Location

Key

Site boundary

atmos CONSULTING

0 0.25 0.5 1
Kilometres

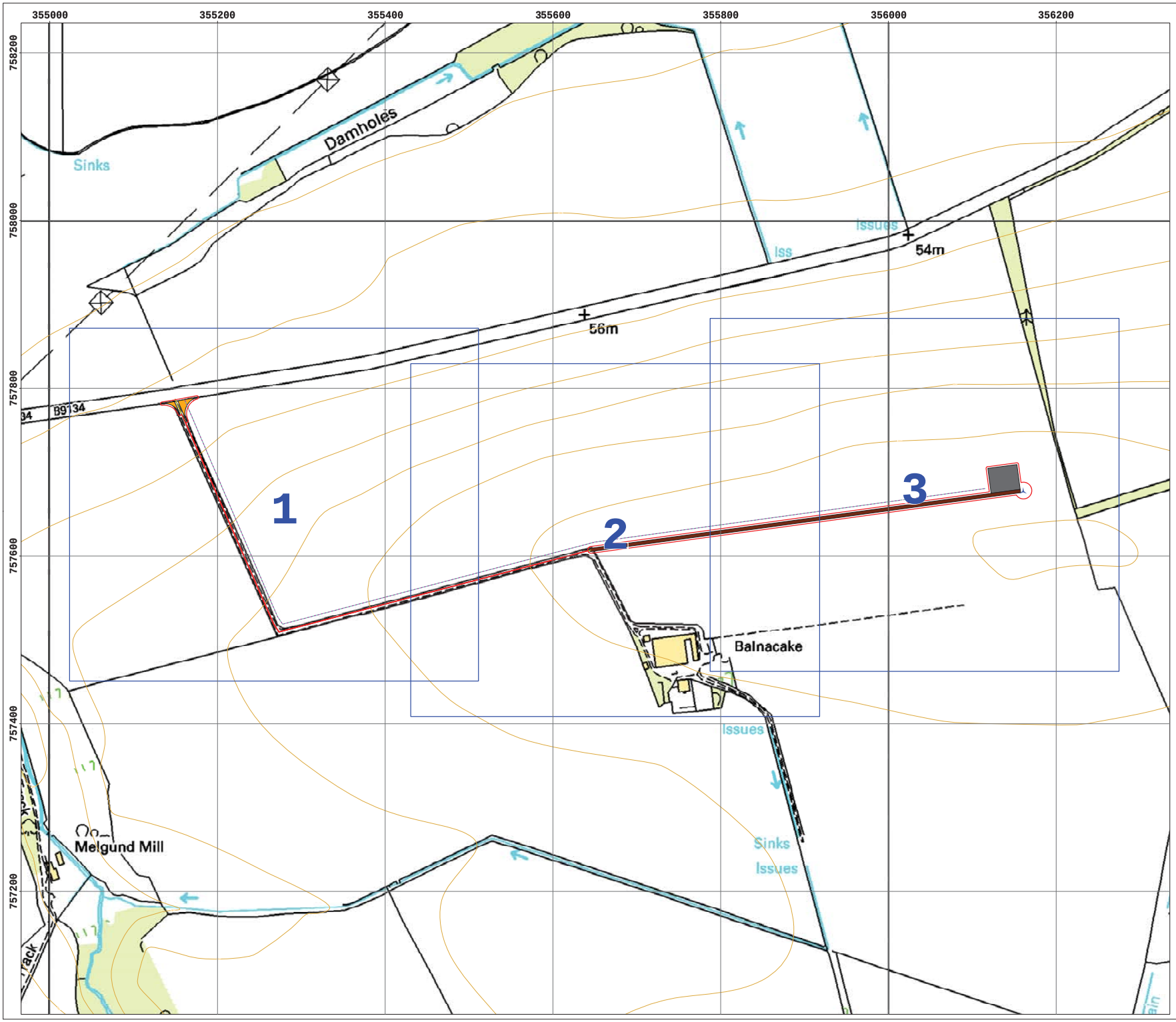
N

Scale @ A3:
1:25,000

20/02/2014 4611/SL/004a

Drawn by: AA Checked by: TH Approved by: NT

AC19



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-1
Site Layout / Application Boundary - Overview

Key

- Planning application boundary
- Turbine location - 356161, 757678
- Proposed cable route
- Existing onsite access track
- Bellmouth
- Crane hardstanding / assembly area
- New onsite access track

atmos CONSULTING

0 55 110 220
Meters

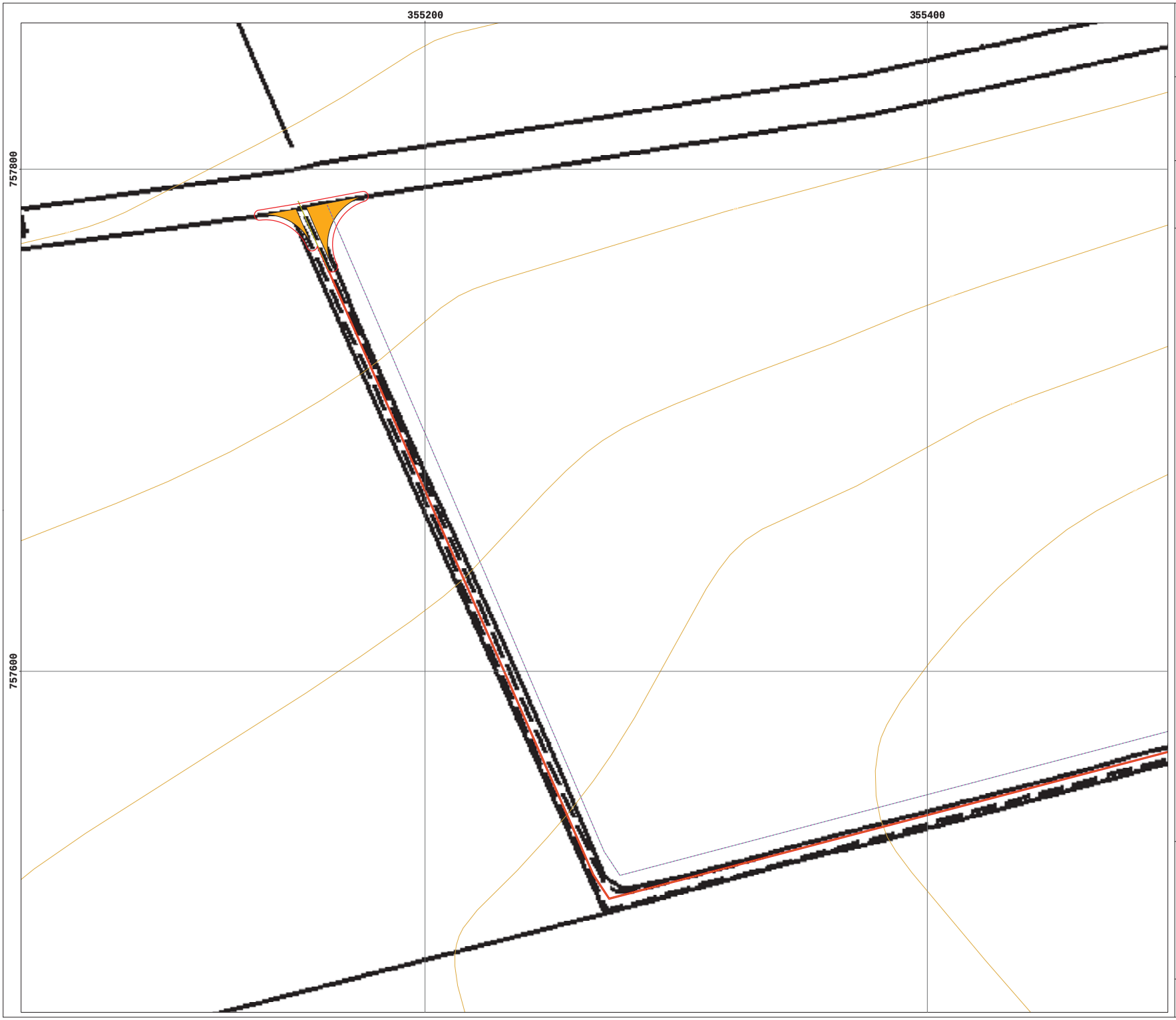
N

Scale @ A0:
1:1,500

11/04/2014 TL01c 4611/SL/013a-1

Drawn by: JM Checked by: TH Approved by: NT

AC19



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-1
Site Layout / Application Boundary - Map 1

Key

- Planning application boundary
- Turbine location - 356161, 757678
- Proposed cable route
- Existing onsite access track
- Bellmouth
- Crane hardstanding / assembly area
- New onsite access track

atmos CONSULTING

0 15 30 60
Meters

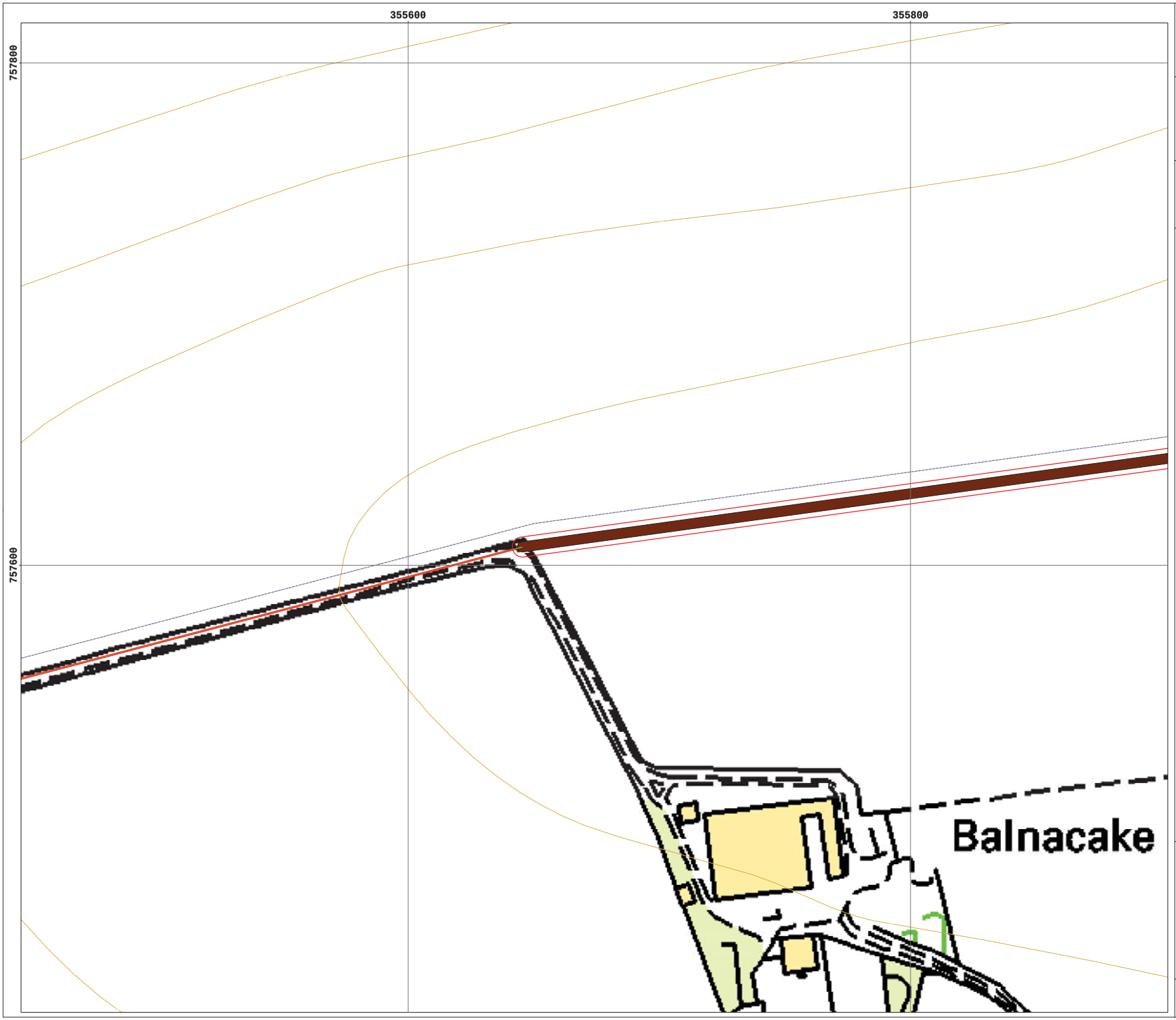
N

Scale @ A0:
1:500

11/04/2014 TL01c 4611/SL/013a-2

Drawn by: JM Checked by: TH Approved by: NT

AC19



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-1
Site Layout / Application Boundary - Map 2

Key

- Planning application boundary
- Turbine location - 356161, 757678
- Proposed cable route
- Existing onsite access track
- Bellmouth
- Crane hardstanding / assembly area
- New onsite access track

atmos CONSULTING

0 15 30 60
Meters

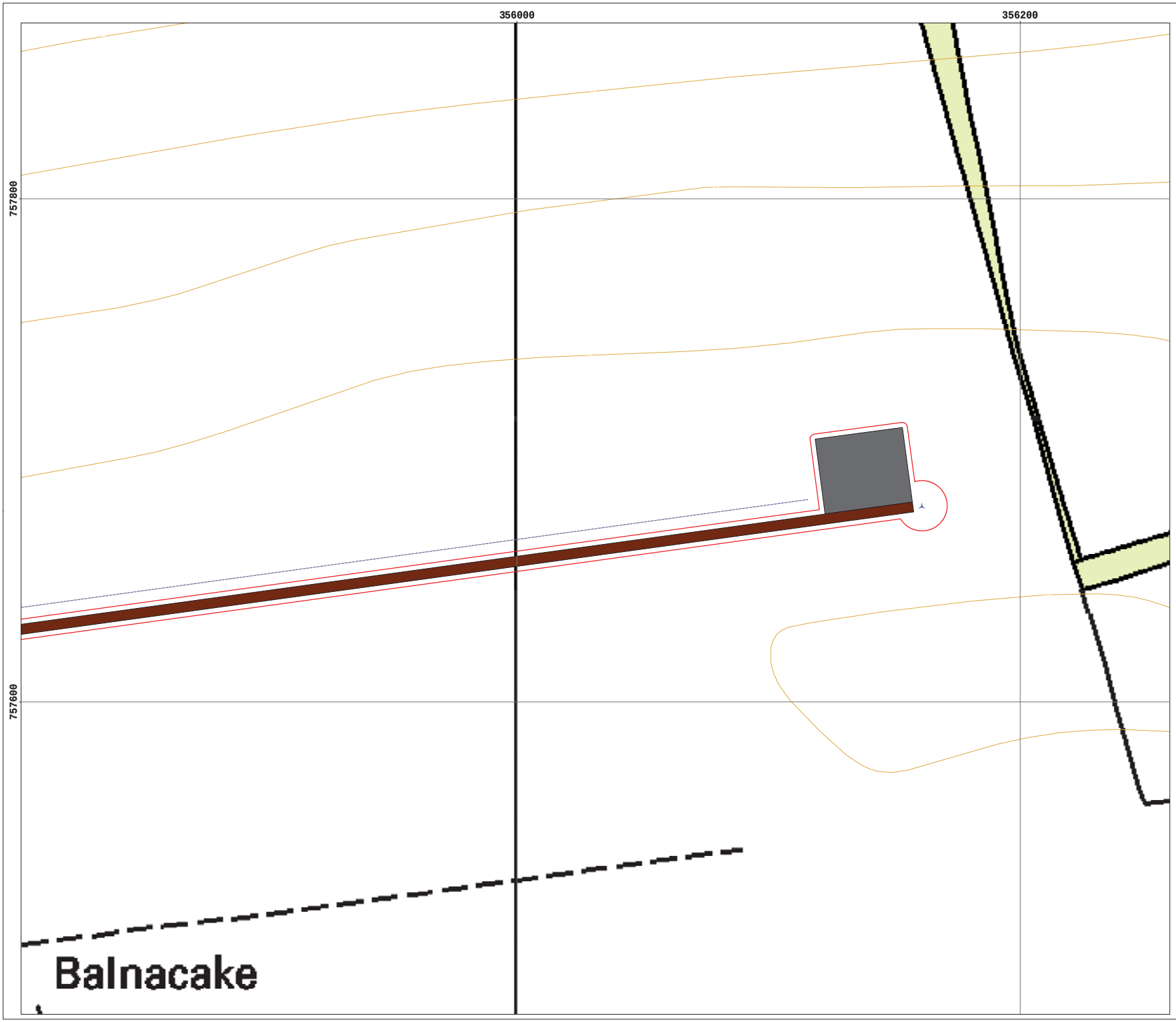
N

Scale @ A0:
1:500

11/04/2014 TL01c 4611/SL/013a-3

Drawn by: JM Checked by: TH Approved by: NT

AC19



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-1
Site Layout / Application Boundary - Map 3

Key

- Planning application boundary
- Turbine location - 356161, 757678
- Proposed cable route
- Existing onsite access track
- Bellmouth
- Crane hardstanding / assembly area
- New onsite access track

atmos CONSULTING

0 15 30 60
Meters

N

Scale @ A0:
1:500

11/04/2014 TL01c 4611/SL/013a-4

Drawn by: JM Checked by: TH Approved by: NT

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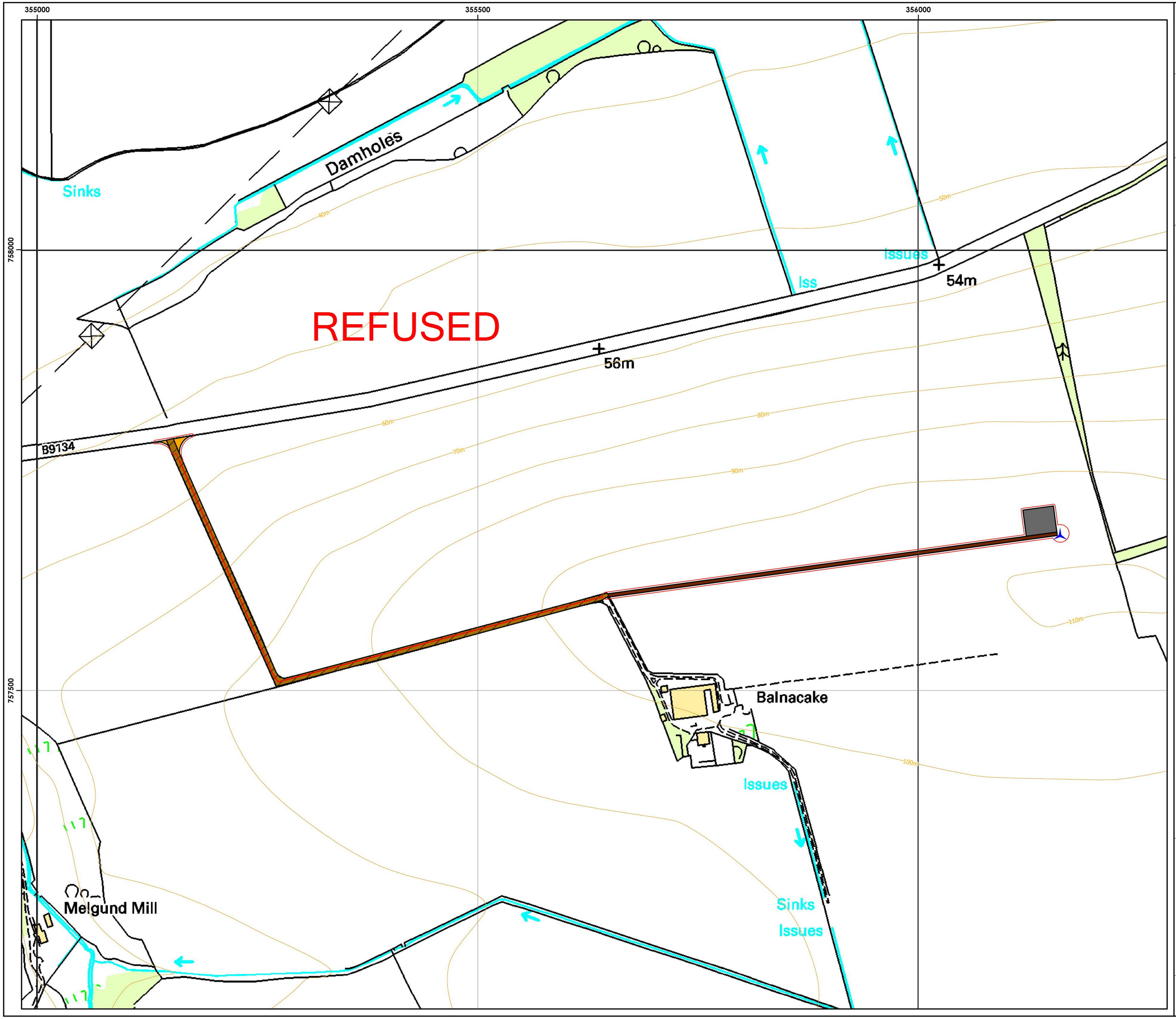
Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-1
Site Layout / Application Boundary



Key

- Planning application boundary
- Turbine location - 356161, 757678
- Bellmouth
- Crane hardstanding / assembly area
- Existing onsite access track
- New onsite access track

atmos CONSULTING

0 50 100 200
Metres

N

Scale @ A3:
1:4,000

20/02/2014 TL01c 4611/SL/003a
Drawn by: AA Checked by: TH Approved by: NT

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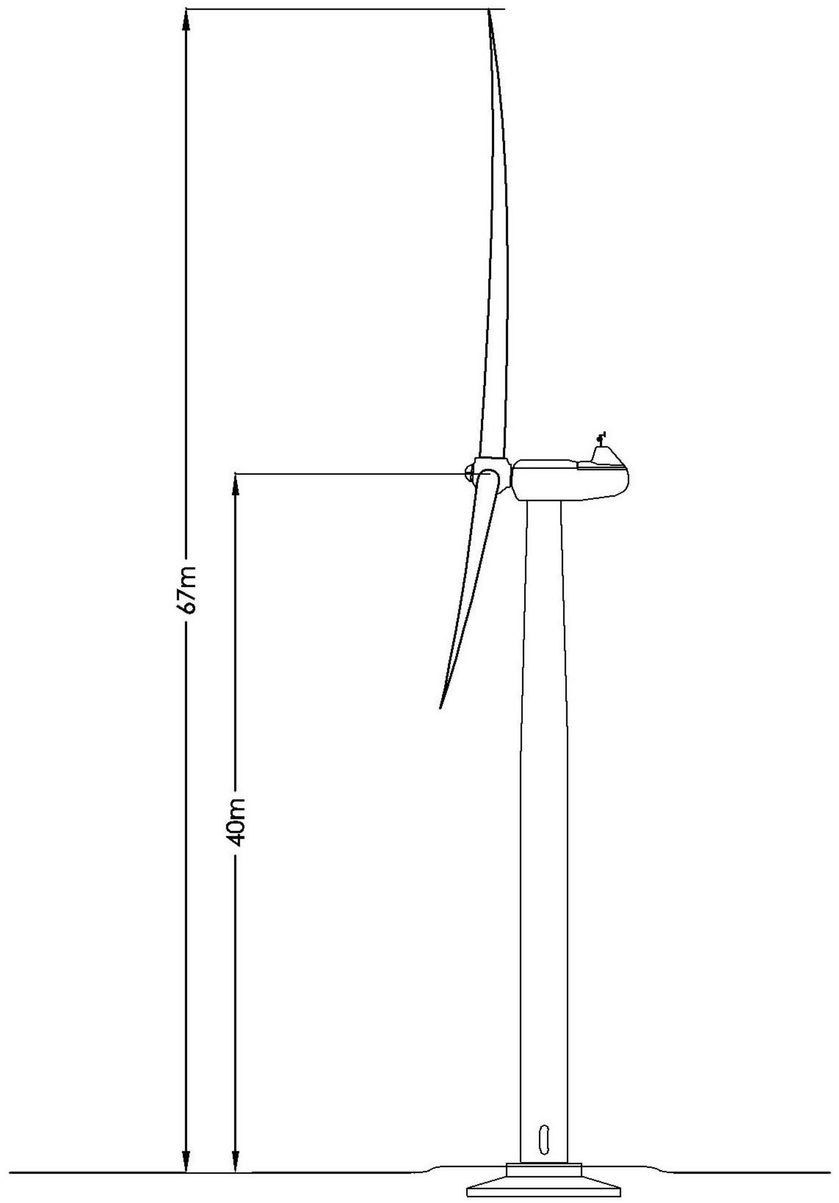

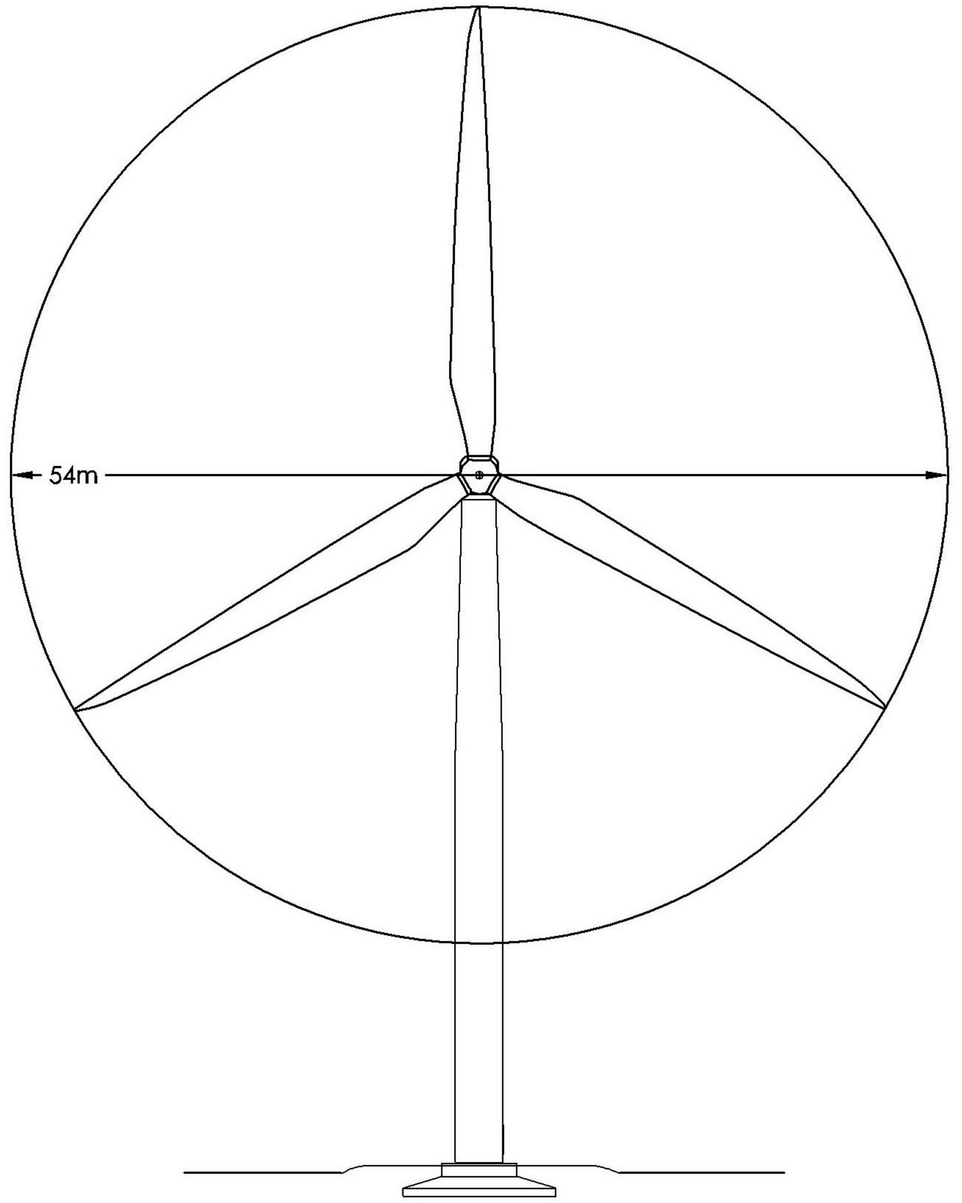

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 2-1
Typical turbine dimensions

Notes:
Approximate ground level of wind turbine is 100mAOD.

atmos CONSULTING

0 5 15 30
Metres

Scale @ A3:
1: 500

19/02/2014 4611_CS_C001a
Drawn by: TG Checked by: TG Approved by: NK

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AC20

AC20


11/20/2014


11/20/2014


11/20/2014


11/20/2014

AC20

ANGUS COUNCIL

TOWN AND COUNTRY PLANNING (SCOTLAND) ACT 1997
(AS AMENDED)
TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)
(SCOTLAND)
REGULATIONS 2013

PLANNING PERMISSION REFUSAL
REFERENCE 14/00281/FULL

To **Polar Energy (Netherton) Ltd.**
c/o Atmos Consulting Limited
Rosebery House
9 Haymarket Terrace
Edinburgh
EH12 5EZ

With reference to your application dated 18 April 2014 for planning permission under the above mentioned Acts and Regulations for the following development, viz.:-

Erection of wind turbine of 40 metres to hub height and 67 metres to blade tip and ancillary development at **Field 200M North East Of Balnacake Farm Aldbar Brechin** for **Polar Energy (Netherton) Ltd.**

The Angus Council in exercise of their powers under the above mentioned Acts and Regulations hereby **Refuse Planning Permission (Delegated Decision)** for the said development in accordance with the particulars given in the application and plans docqueted as relative hereto in paper or identified as refused on the Public Access portal.

The reasons for the Council's decision are:-

1 That the proposed turbine by virtue of its height and location close to the top of the escarpment which separates the Low Moorland Hills and the Broad Valley Lowland would result in unacceptable landscape and visual impacts and as such the proposal is contrary to policies ER5, ER34 and S6 of the Angus Local Plan Review (2009).

Amendments:
The application has not been subject of variation.

Informatives:

Dated this **5 December 2014**

Iain Mitchell - Service Manager
Angus Council
Communities
Planning
County Buildings
Market Street
FORFAR
DD8 3LG

Netherton Wind Turbine

Environmental Appraisal

April 2014

Polar Energy (Netherton) Ltd

atmos AC22 CONSULTING

atmos CONSULTING

Environmental Appraisal

Netherton Wind Turbine Project

Polar Energy (Netherton) Ltd

April 2014

AC22

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Document Prepared For
Polar Energy (Netherton) Ltd

Document Prepared By
Atmos Consulting Ltd.

Document Approved By
Atmos Consulting Ltd.

Version	Date	Reason
Final	April 2014	Submission to Angus Council

Rosebery House,
9 Haymarket Terrace,
Edinburgh,
EH12 5EZ

Moray House,
16-18 Bank Street,
Inverness,
IV1 1QY

Durham Dales Centre,
Castle Gardens,
Stanhope,
County Durham,
DL13 2FJ

Mynydd Awel,
Mold Business Park,
Maes Gwern,
Mold,
CH7 1XN

Keystone Innovation Centre
Croxton Road
Thetford
Norfolk
IP24 1JD

AC22

1 Introduction

1.1 The Application

This document has been prepared by Atmos Consulting Ltd. (Atmos) for Polar Energy (Netherton) Ltd. to support a planning application to Angus Council under the Town and Country Planning (Scotland) Act 1997. The application is for the development of a single wind turbine at Netherton 4.5km to the west of Brechin in Angus.

The application seeks consent for the installation of one wind turbine with a generating capacity of up to 500kilowatts (kW) and associated ancillary development. The maximum base to blade tip height of the turbine is 67m when the blades reach their highest point. The height of the tower would be around 40m with a rotor diameter of up to 54m. Ancillary development would include access track, external electrical housing, underground electricity cabling and temporary construction area. Figure 1-1 provides details of the site layout.

1.2 Site Description

The proposed development site is located on part of Balnacake farm on land which is currently used for agriculture. The site lies approximately 6km southwest of Brechin and approximately 12km northeast of Forfar. Figure 1-2 shows the site location.

There are no properties located within 400m of the proposed turbine location. The closest property is the financially involved Balnacake residential property approximately 450m southwest of the proposed turbine location. The closest non-residential property is a derelict building opposite Broomknowe Cottages approximately 570m northeast of the proposed turbine location.

River South Esk Special Area of Conservation (SAC) flows approximately 780m north of the proposed turbine location. There are no other designated areas for natural heritage within 5km of the site. The closest SSSI to the site is the Montrose Basin SPA/SSSI/Ramsar approximately 10km to the east of the site designated for its non-breeding bird assemblage.

1.3 The Applicant

The Applicant is Polar Energy (Netherton) Ltd.

1.4 Purpose of the Supporting Statement

This document has been produced to support the planning application in providing more details on the site and the results of the various assessments which have been undertaken as part of the design of the project.

It has been produced by Atmos; a specialist environmental, technical and planning consultancy with experience in the consenting over 500MW of wind energy developments.

Enquiries regarding this document should be made to:

Atmos Consulting Ltd.

Rosebery House

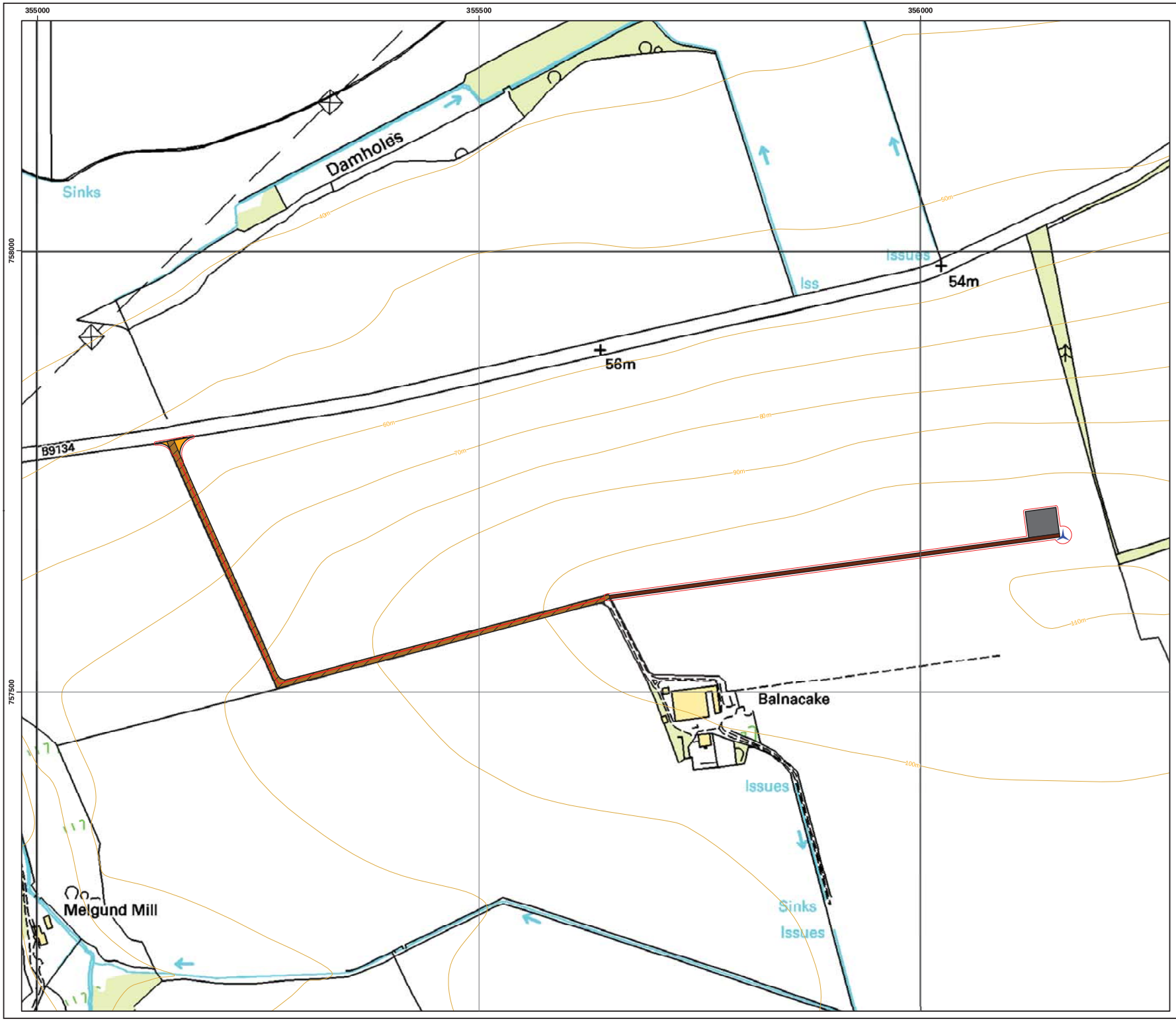
9 Haymarket Terrace

Edinburgh

EH12 5EZ

Tel. 0131 346 9100

AC22



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-1
Site Layout / Application Boundary

Key

- Planning application boundary
- Turbine location - 356161, 757678
- Bellmouth
- Crane hardstanding / assembly area
- Existing onsite access track
- New onsite access track

atmos CONSULTING

AC22

0 50 100 200
Metres

N

Scale @ A3:
1:4,000

20/02/2014 TL01c 4611/SL/003a

Drawn by: AA Checked by: TH Approved by: NT

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-2
Site Location

Key

Site boundary

atmos CONSULTING

AC22

0 0.25 0.5 1
Kilometres

N

Scale @ A3:
1:25,000

20/02/2014 4611/SL/004a

Drawn by: AA Checked by: TH Approved by: NT

2 Project Description

2.1 Introduction

This section provides further information on the components of the proposed development and the construction, operation and decommissioning of the wind turbine. The main physical components of the scheme are:

- Single 500kW wind turbine
- External electrical housing unit (2m x 2m x 2.5m high)
- Underground cable connection
- Access track, upgrade and new section; and
- Crane hardstanding/Assembly area.

The total area for the planning application is 0.6387 hectares (ha).

2.2 Wind Turbine

It is proposed to install a single 500kW wind turbine generator at NGR 356161, 757678 which consists of a conical tubular steel tower, nacelle which contains the generator and associated equipment which are attached to a hub and rotor assembly including three glass/carbon fibre-reinforced polyester blades. An example of a typical turbine model similar to that which is proposed is shown in Figure 2-1.

The final choice of turbine will be subject to a competitive selection process based on the turbine models available at the time of construction. Notwithstanding this the maximum tip height will not exceed 67m.

Wind turbines are typically of variable speed type so that the rotor speed varies according to the energy available in the wind. Typically turbines are capable of generating power for wind speed between 3 and 25 metres per second (m/s). At wind speeds of over 25m/s the turbine will automatically shut down.

2.3 Ancillary Works

2.3.1 Wind Turbine Foundations

A buried reinforced concrete foundation would be constructed for the wind turbine. Detailed design for the foundation would be undertaken following geo-technical investigation. Generally a gravity foundation is used which for this size of turbine would consist of around 180m^3 of concrete poured in an excavation 2m to 3m deep. Subsoil and topsoil would be replaced on top of the foundation allowing the land around the tower to return to grass, except for the access track itself.

2.3.2 External Electrical Housing Unit

A small external electrical housing unit may be required adjacent to the wind turbine. This would house the electrical switchgear, electrical transformer, metering equipment and control system equipment. A prefabricated structure is proposed, approximately 2m x 2m x 2.5m high, on a concrete slab foundation. The installation would be in accordance with current regulations and practices including the Electricity Safety, Quality and Continuity Regulations 2002. Depending on final turbine selection, the electrical gear may be housed within the turbine whereby no external housing will be required.

2.3.3 Access track

A section of new access track is required to facilitate the delivery of the turbine components and pre-fabricated electrical housing. This track will be retained for the lifetime of the project to allow access for maintenance vehicles. The proposed track has a running width of 4m with the new section extending to approximately 480m beyond the existing length of track.

2.3.4 Crane Hard-Standing

A further area of hardstanding is required adjacent to the wind turbine position to provide a stable surface for the main-lift crane and tail crane during installation.

2.3.5 Parking

No parking facilities are required for this development as there will be no permanent staff associated with the project. Once the turbine is fully commissioned, maintenance traffic will make use of the hardstanding area when visiting the site.

2.3.6 Electrical connection

The wind turbine would be connected to the existing electricity grid via an underground cable laid adjacent to the track.

2.3.7 Micro-siting

It is normal practise to allow a small margin for adjustment of the wind turbine and equipment positions to accommodate any unusual ground conditions encountered during excavations. We would therefore request a 15m micro-siting allowance.

2.4 The Construction Process

The start date for the construction programme will depend on a number of factors including the outcome of the planning process, procurement of components and availability of contractors. It is anticipated that on-site construction would take up to three months and could be undertaken in three main phases:

1. Ground Works
   a. Construct access tracks
   b. Trench and lay cables
   c. Excavate and pour concrete turbine foundation
2. Wind Turbine Installation
   a. Deliver large components
   b. Employ cranes
   c. Erect wind turbine
3. Commissioning
   a. Electrical connections

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b. Commissioning (checking and setting in operation)
c. Site reinstatement

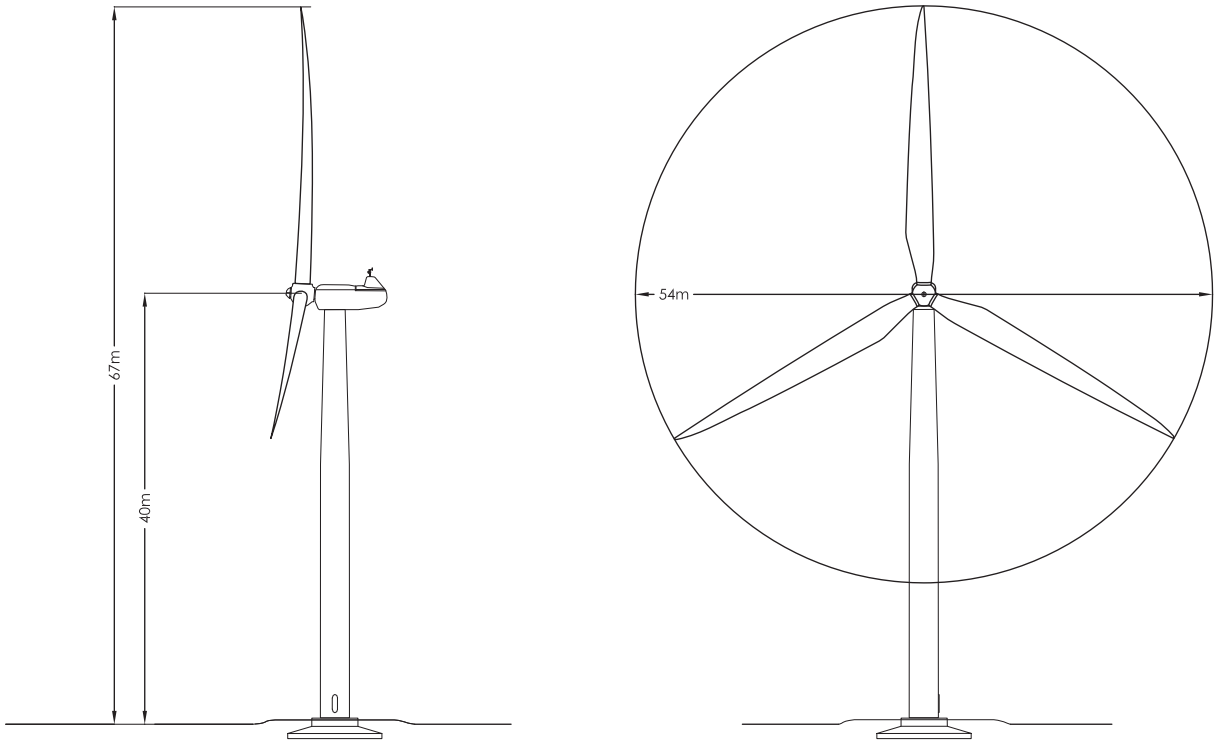
Excavated material would be reused on the site. Concrete for the foundations will be imported ready mixed from a suitable nearby quarry.

2.5 Working Times

The proposed normal working times of the construction activities are 08h00 to 18h00 Monday to Friday and 08h00 to 13h00 Saturday. During the installation of the wind turbine there may be a requirement to extend the working hours to take advantage of suitable weather conditions as some critical elements of installation cannot be stopped once started.

2.6 Decommissioning

Wind turbines have a normal service life of approximately 20-25 years. At the end of this period, the turbine would be decommissioned and the land put back to agricultural use. The above ground equipment would be removed from site. Unless otherwise agreed, the upper section of the concrete foundations would be removed to a depth of 0.5m. Underground cables would be left in place.



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 2-1
Typical turbine dimensions

Notes:
Approximate ground level of wind turbine is 100mAOD.

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0 5 15 30
Metres

Scale @ A3:
1: 500

19/02/2014 4611_CS_C001a
Drawn by: TG Checked by: TG Approved by: NK

3 Planning and Climate Change

3.1 Scottish Planning Context

The Climate Change (Scotland) Act 2009 creates a legislative framework to pursue a reduction in emissions associated with the unsustainable use of fossil fuels. The Government's headline targets are to generate the equivalent of 100% of Scotland's gross annual electricity consumption and the equivalent of 11% of Scotland's heat demand from renewable sources by 2020.

National Planning Policy is set out in Scottish Planning Policy (SPP) published in February 2010. Paragraph 187 states that planning authorities should support the development of wind farms in locations where the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed.

3.2 Angus Development Plan

The proposed Netherton wind turbine is situated within Angus and the development plan for the area consists of the Angus Local Plan Review adopted in 2009 and the TAYplan-Strategic Development Plan approved 2012. In considering any application at the Netherton site, the adopted Development Plan will form the main statutory instrument under planning legislation however the supplementary guidance will be a material consideration in planning providing that it generally accords with national policy.

3.2.1 Key Development Plan Policies

The Tayplan, approved in June 2012, includes Policy 6: Energy and Waste/Resource Management Infrastructure. Policy 6 relates to the aim of delivering a low/zero carbon future for the city region to contribute to meeting Scottish Government energy targets and indicates that, in determining proposals for energy development, consideration should be given to the effect on off-site properties, the sensitivity of landscapes and cumulative impacts. Tayplan Policy 6 does not add any new assessment criteria to the existing Angus Local Plan Review policies.

The Angus Local Plan Review dates from 2009 and was prepared in the context of SPP6 and is more up to date than the Structure Plan, though its adoption predates SPP. The key Local Plan policies are 'Policy ER34 Renewable Energy Developments' and 'Policy ER35 Wind Energy Developments'.

'Local Plan Policy ER34' sets out that proposals for all forms of renewable energy development will be supported in principle and will be assessed against a number of criteria.

'Local Plan Policy ER35' sets out that wind energy proposals must meet the requirements of Policy ER34 above and must also demonstrate that a number of criteria are met.

Other development plan policies will be relevant to the determination of the planning application on a subject by subject basis.

3.2.2 Local Plan

Policy ER34 and ER35 in the Angus Council local plan are the starting point for the consideration of wind energy proposals in Angus. The aims of these policies are to encourage the sensitive development of renewable energy facilities. Proposals for all forms of renewable energy developments will be supported in principle and will be assessed against the following criteria as stated in Policy ER34:

1) the siting and appearance of apparatus have been chosen to minimise the impact on amenity, while respecting operational efficiency;
2) there will be no unacceptable adverse landscape and visual impacts having a regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints;
3) that the development will have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons;
4) no unacceptable environmental effects of transmission lines, within and beyond the site;
5) access for construction and maintenance traffic can be achieved without compromising road safety or causing unacceptable permanent change to the environment and landscape; and
6) that there will be no unacceptable impacts on the quality of groundwater or surface water resources during construction, operation and decommissioning of the energy plant.

Wind energy developments must meet the requirements of Policy ER34 and also demonstrate the following:

1) the reasons for site selection;
2) that no wind turbines will cause unacceptable interference to birds, especially those that have statutory protection and are susceptible to disturbance, displacement or collision;
3) there is no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light;
4) that no wind turbines will interfere with authorised aircraft activity;
5) that no electromagnetic disturbance is likely to be caused by the proposal to any existing transmitting or receiving system, or (where such disturbances may be caused) that measures will be taken to minimise or remedy any such interference;
6) that the proposal must be capable of co-existing with other existing or permitted wind energy developments in terms of cumulative impact particularly on visual amenity and landscape, including impacts from development in neighbouring local authority areas;
7) a realistic means of achieving the removal of any apparatus when redundant and the restoration of the site are proposed.

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3.2.3 Supplementary Planning Guidance

Angus Council approved, as supplementary guidance, the 'Angus Wind Farms - Landscape Capacity and Cumulative Impacts Study' in September 2008 for use in the assessment of wind farm applications and to provide advice on the cumulative effects of existing and potential future wind farm developments in Angus. This document was produced in response to a number of planning applications and a conjoined planning inquiry but was subsequently adopted by the Council for wider use. The study examines the various landscape types in Angus and provides a comment on landscape capacity within these areas. The document is not part of the development plan and, therefore, is of limited weight for development management purposes.

The SPG identifies the area of the site as being within one of the identified Lowland Areas (12 Low Moorland Hills) where the scale and type of landscape suggests that careful siting of windfarms of a medium to small scale only. The Lowland Low Moorland Hills landscape type though clearly higher than the Lower Esk Valleys and Montrose Basin area, are of lower elevation than the adjacent Dislope Farmland area. Most of the Lowland Area is classified as having low sensitivity however within the wider area, there are locally important examples of higher natural heritage sensitivity such as small-scale landscapes, skylines and habitats that will influence the location of wind turbines.

The Implementation Guide for Renewable Energy was approved by the Council in June 2012. In terms of its status, the 'Implementation Guide' does not form part of the Development Plan, but is a material planning consideration for the determination of planning applications. Its provisions should be considered alongside other material considerations, which include national planning and energy policy and the various benefits of the proposal as described in the application package. The guidance offers more detailed information and clarification of the main factors in determining renewable energy proposals, an application checklist and guidance on landscape and visual assessment issues and noise assessments. The Implementation Guide identifies the area as having scope for turbines circa 80m in height which do not disrupt the principle ridgelines or adversely affect the setting of important landscape features monuments such as Balmashanner Monument and Finavon and Turin hillforts.

The Strategic Landscape Capacity Assessment for wind energy in Angus by Ironside Farrar was adopted in November 2013. In terms of its status, this document does not form part of the development plan but is a material consideration for the determination of planning applications. The study identifies the Montreathmont Hills sub area as having low capacity for 50m-80m turbines.

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4 Noise

4.1 Assessment Methodology

The assessment of operational noise is carried out in accordance with ETSU-R-97, *'The Assessment and Rating of Noise from Wind Farms'* (hereafter referred to as ETSU) and in line with best practice given in the IOA *'Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise'* (hereafter referred to as the IOA Good Practice Guide (GPG).

'Onshore Wind Turbines', which replaces parts of PAN45 (Scottish Executive, 2002) provides specific advice on noise from wind farms. Specifically, the document states:

"…The Institute of Acoustics (IOA) has since published Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise. The document provides significant support on technical issues to all users of the ETSU-R-97 method for rating and assessing wind turbine noise, and should be used by all IOA members and those undertaking assessments to ETSU-R-97. The Scottish Government accepts that the guide represents current industry good practice."

ETSU sets out a method of assessing the operational noise levels from a wind farm and calculating appropriate evolution criteria. In accordance with the ETSU method, the assessment of noise follows these stages:

- Identification of the nearest Noise Sensitive Receptors (NSRs);
- A screening exercise to identify any properties where expected levels of wind turbine noise may exceed 35dB(A) for wind speeds up to 10m/s at 10m height, to determine if background noise monitoring is necessary;
- Where required, a background noise survey at receptor locations in parallel with wind speed monitoring on the site;
- Generation of a background noise curve from the measured data, characterising the noise levels as a function of wind speed;
- Generation of agreed noise limits for each NSR;
- Prediction of received noise levels at NSRs (immission levels), by means of a noise model, across a range of wind speeds;
- Comparison of predicted levels with agreed noise limits;
- Assessment of any cumulative effects; and
- Identification of mitigation in terms of layout and attenuation if necessary.

NSRs are properties which are sensitive to noise and, therefore, require protection from nearby noise sources. A number of NSRs have been identified surrounding the proposed development, all of which are residential properties. Consequently, noise immission levels throughout the assessment are predicted, where appropriate, to the closest garden boundary, rather than the façade of the property. This is to ensure the continued protection of existing amenity of residential outdoor areas.

The closest NSR assessment locations to the proposed development are detailed in Table 4-1 and shown on Figure 4-1.

Table 4-1: Nearest Identified Noise Sensitive Receptors (NSRs)

NSR Name	NSR ID	Approximate OS Grid Co-ordinates	
		x	y
Broomknowe	NSR01	356347	758319
Broomknowe Cottages	NSR02	356422	758163
Muiryloan House	NSR03	356716	758294
Walkend Cottage	NSR04	356862	757656
Mains of Aldbar	NSR05	357114	757728
Sparmuir	NSR06	357180	757466
White Myre	NSR07	357151	756994
House View House	NSR08	356593	757030
Wandershiell	NSR09	356380	757125
Balnacake	NSR10	355787	757443
Bibberhill	NSR11	355363	756929
Melgund Mill	NSR12	355028	757230
Netherton	NSR13	354840.	757690
Colinshaugh	NSR14	355016	758471

The ETSU screening exercise is carried out in order to identify any properties where the noise immission levels may exceed 35dB LA90. To this end, a noise propagation model is run, which assumes the turbine is operating at maximum sound power output. The model defines a 35dB LA90 noise contour surrounding the proposed development. Any properties located within and on the edge of this contour are then identified as the nearest NSRs which require a 'full' ETSU assessment to be undertaken. This assessment requires baseline noise level monitoring, the results of which are used to derive the noise level limits for each NSR. However, where no NSRs are identified within the noise contour, no further assessment is required.

This is detailed in ETSU as follows:

"We are of the opinion that if the noise is limited to an LA90,10min of 35dB up to wind speeds of 10m/s at 10m height, then this condition alone would offer sufficient protection of amenity, and background noise surveys would be unnecessary. We feel that, even in sheltered areas when the wind speed exceed 10m/s on the wind farm site, some additional background noise will be generated which will increase the noise level at the property. This type of condition may be suitable for single turbines or wind farms with large separation distances between turbines and the nearest properties."

4.2 Turbine Data

A-weighted warranted broadband sound power level data for the proposed turbine has been obtained from the turbine manufacturer for the EWT DW54-500kW turbine model. This is the developer's preferred turbine type and is representative of a typical turbine in the class proposed for the development. The EWT broadband data is provided in Appendix 4-1.

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The octave band data for the EWT DW54-500kW turbine is not warranted, but has been standardised to the warranted broadband sound power levels supplied by the manufacturer. Uncertainty has been accounted for within the manufacturer's warranted broadband levels.

The standardised octave band sound power level data used within the noise model is detailed in Table 4-2. This represents the turbine operating at maximum noise level output, which occurs at wind speeds of 9 and 10m/s.

The octave band data at 10m/s gives an overall warranted broadband sound power level of 100.5dB(A) when logarithmically 'summed' together.

Table 4-2: Standardised octave band sound power level data for EWT DW54-500kW at maximum noise output, SWL dB(A)

63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	Overall*
82.7	88.8	94.1	95.4	94.0	91.5	84.6	72.8	100.5
*logarithmic sum of octave band data, corresponding to the warranted broadband level published by the manufacturer for a wind speed of 10m/s (maximum noise output).								

Based on this data, noise propagation calculations are undertaken in accordance with ISO9613-2, '*Acoustics – Attenuation of Sound during Propagation Outdoors*' (ISO, 1996), using the propriety software model CadnaA. The model uses the following input parameters:

- Temperature is assumed to be 10°C and relative humidity as 70%;
- A ground attenuation factor of 0.5 is assumed. This is in accordance with the IOA GPG which recommends a ground factor of 0.5 be used for all turbines with warranted sound power levels;
- All NSR heights are set to 4m; and
- No barrier attenuation is included, i.e. attenuation attributable to the effects of local topography or manmade structures is not included within the calculations.

4.3 Results

The calculated noise immission levels are detailed in Table 4-3.

The propagation model provides for the prediction of sound pressure levels based on downwind (i.e. worst case) conditions and other conditions favourable for noise propagation. When the wind is blowing in the opposite direction, noise levels will be significantly lower; therefore, the noise propagation model is inherently conservative.

Table 4-3: Calculated Predicted Noise Immission Levels (dB LA90) at NSRs

NSR Name	NSR ID	Predicted LA90 dB
Broomknowe	NSR01	29
Broomknowe Cottages	NSR02	31
Muiryloan House	NSR03	26
Walkend Cottage	NSR04	28
Mains of Aldbar	NSR05	25
Sparmuir	NSR06	24
White Myre	NSR07	22
House View House	NSR08	27
Wandershiell	NSR09	30
Balnacake	NSR10	33
Bibberhill	NSR11	23
Melgund Mill	NSR12	22
Netherton	NSR13	21
Colinshaugh	NSR14	21

In addition to the ISO9613-2 noise propagation calculations presented above, the assessment also considers the effect of the intervening ground profile between the proposed turbine and the NSRs, as per the methodology within the IOA GPG.

The GPG states in paragraph 4.3.9:

"A further correction of +3dB should be added to the calculated overall A-weighted noise level for propagation 'across a valley', i.e. a concave ground profile, or where the ground falls away significantly, between the turbine and receiver location.

The following criterion of application is recommended:

$$h_m \geq 1.5 \times (abs\ (h_s - h_r) / 2)$$

Where h_m is the mean height above the ground of the direct line of sight from the receiver to the source, and h_s and h_r are the heights above local ground level of the source and receiver respectively."

Using topographic data at a resolution of 50m, along with the location of the turbine and the closest NSRs, it is found that a correction of +3dB is to be added to the predicted noise level at NSR01, NSR02, NSR03 and NSR14. No corrections at other NSRs are required. The corrected noise propagation calculations are shown in Table 4-4.

Table 4-4: Predicted Noise Immission Levels (dB LA90) at NSRs

NSR Name	NSR ID	Predicted LA90 dB
Broomknowe	NSR01	32*
Broomknowe Cottages	NSR02	34*
Muiryloan House	NSR03	29*
Walkend Cottage	NSR04	28
Mains of Aldbar	NSR05	25
Sparmuir	NSR06	24
White Myre	NSR07	22
House View House	NSR08	27
Wandershiell	NSR09	30
Balnacake	NSR10	33
Bibberhill	NSR11	23
Melgund Mill	NSR12	22
Netherton	NSR13	21
Colinshaugh	NSR14	24*
*Correction of +3dB added to the predicted noise levels for these NSRs.		

It can be seen from Table 4-4 that, at a maximum noise output, the noise immission levels from the proposed turbine do not exceed ETSU-R-97 'simplified' noise limit of 35dB LA90 at any of the identified NSRs.

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4.4 Cumulative Assessment

There are no known wind turbine schemes, either operational, in planning or at a scoping stage, which could impact on the calculated noise immission levels at the identified NSRs. The effect of cumulative noise impacts has, therefore, not been considered within the assessment.

4.5 Summary

A noise assessment has been undertaken for the proposed wind turbine development, in accordance with ETSU-R-97. The assessment has demonstrated that the predicted noise immission levels do not exceed the ETSU-R-97 'simplified' noise limit of 35dB LA90 at any receptor. A 'full' ETSU-R-97 noise assessment is therefore not required.

The impact of noise from the proposed development is not considered to be significant and as a result, there will be no negative noise impacts associated with the operation of the turbine.

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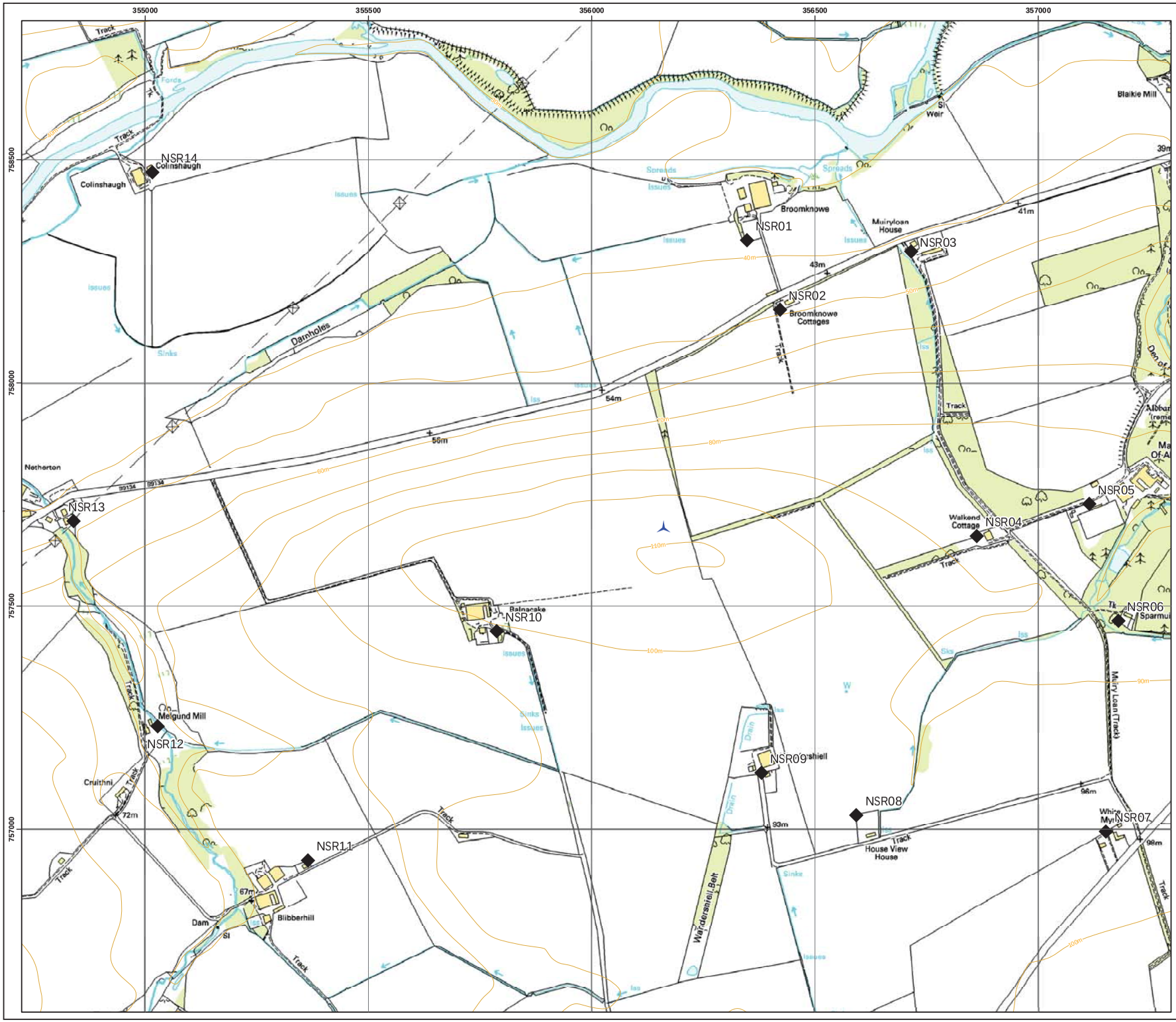

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 4-1
Noise Sensitive Receptors

Key

- Turbine location
- Noise Sensitive Receptor
  - NSR01 - Broomknowe
  - NSR02 - Broomknowe Cottages
  - NSR03 - Muiryloan House
  - NSR04 - Walkend Cottage
  - NSR05 - Mains of Aldbar
  - NSR06 - Sparmuir
  - NSR07 - White Myre
  - NSR08 - House View House
  - NSR09 - Wandershiell
  - NSR10 - Balnacake
  - NSR11 - Bibberhill
  - NSR12 - Melgund Mill
  - NSR13 - Netherton
  - NSR14 - Colinshaugh

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0 100 200 400
Metres

N

Scale @ A3:
1:7,919.61

20/02/2014 TL01c 4611/NO/012a
Drawn by: AA Checked by: TH Approved by: EK

5 Landscape and Visual

5.1 Introduction

This chapter presents the Landscape and Visual Impact Assessment (LVIA) for the proposed wind turbine development at Netherton. The purpose of the assessment is to determine the significance of impact (or effect) of the proposed development on the landscape and visual resource of the area.

LVIA's are separate, although linked, procedures. Landscape effects relate to the direct physical changes to the fabric or individual elements of the landscape. They also relate to the potential indirect changes to the wider patterns of landuse, landcover and the arrangement of landscape features which determine the character of the landscape. Visual effects relate to the potential changes in views and perception of the proposed development on visual amenity.

5.1.1 The Proposed Development and the Basis for Assessment

The LVIA is based on the development of a single turbine up to the maximum tip height of 67m. This turbine would be located within the Montreathmont Forest and Moor area in Angus. It would be classified as a Medium/Large Turbine 50m to < 80m in height in line with Angus Councils, Strategic Landscape Capacity Assessment for Wind Energy (SLCA), November 2013. This is the fourth turbine size category out of six.

The proposal would also include a control building, an access track, underground cabling, crane pad and temporary construction and laydown area. The assessment of these associated elements is considered, where relevant, to the assessment of effects upon the landscape and visual resource.

5.2 Methodology and Approach

5.2.1 Scope Guidance

This appraisal has been completed in accordance with the Scottish Natural Heritage (SNH) guidance on the "Natural Heritage assessment of small scale wind energy projects which do not require formal Environmental Impact Assessment (EIA)", March 2008 in accordance with the screening response from Angus Council. The SNH guidance indicates that for turbines of over 50m in height, the following should be undertaken:

- Consultation with the planning authority over the scope of the assessment;
- Production of a Zone of Theoretical Visibility (ZTV) map;
- Visualisations and photomontages, focusing on key viewpoints;
- Assessment of sensitivity, magnitude of change and residual effects;
- Map of all wind turbine proposals in the public domain within the study area;
- Assessment of all applied, consented or constructed proposals within 30km of the application proposal

Data Sources and Guidance

The LVIA will follow relevant standards and guidance, principally set out in the Landscape Institute and Institute of Environmental Management & Assessment's (IEMA) Guidelines for Landscape and Visual Impact Assessment, third edition, published in 2013 (GLVIA). This edition emphasises the need for well argued proportionate narrative text to assess whether an effect is significant or not with tables and matrices to guide or support the judgement. The LVIA also draws upon other sources of information and guidelines. These are detailed in section 5.8.

5.2.2 Defining Baseline Sensitivity

GLVIA notes that the sensitivity landscape receptors should consider the susceptibility and value attached to the receptor. It describes this as "*the ability of the landscape receptor (whether it be overall character or condition of a particular landscape type or area, or an individual element and /or features, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation*".

The identification of sensitivity therefore needs to be considered in relation to the nature of the change, i.e. the type and scale of development proposed within a particular area or type of landscape and the association and tolerance of the identified landscape or individual contributing elements thereof, to that change. For landscape sensitivity this will include consideration of parameters such as the value placed on the landscape; the pattern, scale and complexity of elements; the consistency of the strength of character; the 'attractiveness' or scenic quality; its contribution to the wider landscape and its robustness, or the degree to which change can be absorbed (defined by, for example, its diversity or openness).

Visual sensitivity will be dependent upon "*the susceptibility (of different receptors) to change in views and visual amenity they experience at particular locations*". It includes a combination of parameters, including the activity / occupation / pastime of the receptors at particular locations which are "publically accessible"; the extent to which their attention or interest may therefore be focused on the "particular view" and the visual amenity they experience at particular locations. It will comprise the location, relative focus and orientation of views, the quality or importance of the existing view; the principal or secondary interest in that view and the ability of the view to accommodate the type of development and the frequency and duration of the view.

Landscape and visual sensitivity can be considered on a graduated scale from High, Medium or Low, or by a combination of categories. The categories are defined below. They are derived from GLVIA. However, it is important to note that the divisions between categories are not always clear cut and "*in reality there will be a graduation in the susceptibility to change*", (GLVIA 6.35) where some landscapes and/or views may exhibit characteristics that fall within more than one sensitivity level. On this matter GLVIA advises that each project should consider the nature of the landscape and groups of people who will be affected and for visual receptors "*the extent to which their attention is likely to be focused on views and visual amenity*". As such professional judgement is required when determining susceptibility/sensitivity of receptors and the rationale for assigning a specific sensitivity will be explained in the assessment

As an additional measure, the visual sensitivity of "private views" from residential properties will also be assessed. This is defined below and in more detail in the section

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on residential amenity effects (5.7). As for the main LVIA it will define the susceptibility to change "*in particular views*". Although residents are recognised as being more susceptible and sensitive, the relative sensitivity will also depend on the nature of the receptor and the value, importance and interest placed on particular views, which contribute to the enjoyment of the property.

Table 5-1: Landscape/Visual Sensitivity

Sensitivity	Receptor	Definition
High	Landscape	Typically small scale, enclosed landscapes with complex landform and a mosaic of habitat and landcover where turbines would be out of scale. Irregular patterns of enclosure and traditional settlement pattern with a general absence of contemporary structures giving a sense of remoteness and wilderness. Well used recreational areas with extensive views within/into/out of area to distant horizons; Landscape of distinctive character with strong cultural associations
	Visual	Residents with principal/direct views, which are "private" views constantly available and contribute to the experience / enjoyment and value attached to a particular view from the house; Visitors to scenic viewpoints/ beauty spots or engaged in outdoor recreation with an interest focused on a particular view; Long distance footpath routes with prolonged viewing opportunities; Important and recognised views valued for attractiveness/ scenic quality and locations likely to attract high numbers of people with a primary interest in the view. Intact and unaffected by modern influences.
Medium	Landscape	Medium scale landscape with a combination of open and more enclosed landform. Contemporary structures/development are a feature either within/into/out of area. Rural working landscapes containing evidence of human activity with strong characteristics, relatively intact.
	Visual	Residents and visitors with secondary, distant views away from the principal focus of the house/curtilage and private view; Footpaths with fleeting/ transient/ peripheral views. Other tracks; roads used for tourism or journeys of a recreational nature, locations likely to attract moderate numbers of people. Contemporary structures/development are an element of views .Viewers with a moderate interest in their surroundings e.g. users of outdoor recreation areas
Low	Landscape	Large scale open/exposed landscapes with smooth regular flowing landform and limited variation in landcover in which turbines would not be out of scale. Contemporary structures such as pylons, masts and other infrastructure evident. Visually contained by landform or vegetation with limited views within/into/ out of area with near horizons. Limited cultural associations and little if any recreational or amenity function.
	Visual	Viewers with a passing interest in the view e.g. Views from industrial or commercial buildings or areas; roads used primarily for commercial travel and/or commuting; views from trains, locations likely to attract low numbers of people. visitors engaged in an occupation/pastime, rather than focused on the wider landscape

5.2.3 Defining Magnitude of Effect

Magnitude of change is defined within GLVIA as "a combination of the scale, extent and duration of an effect" and are categorised as High, Medium, Low or Negligible or as a combination of two categories to provide a more detailed, intermediate group i.e. High to Medium or Medium to High. Effects can be direct, where they involve a physical change to a defined element or characteristic of the landscape, or indirect, where effects are secondary and perceived on the wider pattern of elements or on visual amenity, away from the proposed site.

Criteria for defining the level of magnitude are identified below. Magnitude of Visual change is derived from guidance in the Visual Assessment of Wind Farms: Best Practice (University of Newcastle 2002). The magnitude will also be influenced by the spatial extent of the effect, the duration and the degree to which the effect is reversible.

Table 5-2: Magnitude of Effect

Magnitude	Receptor	Definition
High	Landscape	Very obvious or notable change in the balance of landscape characteristics; ranging to particularly intensive change (i.e. a dominating effect) over a more limited area. The proposal would be a prominent feature in the make-up of the character area
	Visual	DOMINANT: Major change to the make-up / balance of the view Commanding, controlling, striking, sharp, unmistakable easily seen.
Medium	Landscape	Whilst notable or obvious, the change would not fundamentally alter the balance of the landscape characteristics
	Visual	PROMINENT/CONSPICUOUS: Moderate changes in the nature of the view. Noticeably distinct, catching the eye or attention, clearly visible and well defined.
Low	Landscape	Very small change in the balance of overall characteristics, such that post development the change would be discernible but the underlying pattern of characteristics would remain similar to the baseline condition.
	Visual	APPARENT: Minor change in the nature of the view. Evident but lacking sharpness of definition, not obvious, indistinct, not clear, obscure, blurred indefinite. Discernible but the underlying nature of the view would remain similar to the baseline (limit of potential visual significance).
Negligible	Landscape	Change, which whilst occurring, would not influence the wider landscape character and/or would be barely discernible, perceptible or legible , approximating to a "no change" situation
	Visual	FAINT/SLIGHT: Very minor change to the view, weak, not legible, near limit of acuity of human eye. Change would be barely discernible, approximating to the "no change" situation.

The assessment will provide rationale for the criteria selected and will highlight any modifying factors, such as the potential for weather conditions to restrict views; the principle aspect of the landscape and visual receptor; the mobility or static nature of receptors, the proportion of any particular character/view affected, the potential for the development to attract the eye or to become a focal point in the view/landscape, to the detraction/benefit of competing visual elements and the presence/absence of other comparable features such as existing wind turbines.

5.2.4 Establishing Extent (and Significance) of Effect

Once the sensitivity and magnitude are classified, they are considered together to assess the extent of effect and its potential significance. This is done using the assessment in the matrix in Table 5.3 to guide the determination of significance. This assessment considers effects of Moderate and above to be significant in EIA terms.

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Table 5-3: Extent of Landscape / Visual Effect

		SENSITIVITY (of the landscape or visual receptor)		
		Low	Medium	High
MAGNITUDE (of the anticipated effect upon the landscape / visual resource	High	Moderate	Moderate/Major	Major
	Medium	Minor/Moderate	Moderate	Moderate/Major
	Low	Minor	Minor/Moderate	Moderate
	Negligible	Negligible	Negligible	Negligible

The prediction and extent of effect cannot always be absolute. Paragraph 7.38 of GLVIA, states that "*Significance of effect is not absolute and can only be defined in relation to each development and its location. It is for each assessment to determine the assessment criteria and the significance thresholds, using informed and well-reasoned judgement supported by thorough justification for their selection, and explanation as to how the conclusions about significance for each effect assessed have been derived*". A conclusion that an effect is '*significant*' should not be taken to imply that the proposed development is unacceptable. Significance of effect needs to be considered with respect to the extent of a landscape or a view over which it is experienced

5.2.5 Consultation

The scope of assessment for the LVIA, including the study area radius, methodology and the proposed number and location of representative viewpoints which were established through liaison with Angus Council and subsequently agreed in October 2013.

5.3 Baseline Conditions

The proposed wind turbine lies within Strathmore area of Angus, to the southwest of Brechin. The host landscape is an area of open, sloping arable farmland and low moorland hills to the south side of the Strathmore valley. Whilst considerable areas exhibit a large, open character with notable areas of mixed farmland, moorland, coniferous forestry plantations and woodland, human influence is also evident, with a dispersed settlement pattern and notable built influences at various points, including power lines, pylons, communication masts and existing wind turbines at similar elevated points on the fringes of Strathmore.

5.3.1 The Landscape Fabric of the Site

The landscape fabric of the proposed site consists of open, gently sloping landform with the proposed turbine sited at approximately 110m AOD. Landform continues to rise and fall gradually at this height to the south. It then descends quickly to the north by around 100m to the River South Esk.

Land cover features are limited across the site. It is defined by large scale, open farmland with fields divided by post and wire fencing. Vegetated features are then limited across much of the development site which adds to the overall scale and simplicity of the landcover. However, to the east and the northeast some woodland shelter belts and woodland area are present. These, provide screening and shelter to residential properties to the northeast. The landscape fabric of the site is, considered to be of medium sensitivity to change on account of its simple scale, frequency, contrast and coverage of moderately valued elements.

5.3.2 Landscape Policy and Designation

Within the study area, a number of designated landscapes exist (Figure 5-1). However, there are no nationally important landscape designations within the study area.

While no local landscape designations exist within Angus, there are three 'principal geographical areas' defined. Local policy and the supporting Angus Windfarms Study, considers that the Highlands and Coast areas are the most sensitive to wind farm developments. The nearest section of the more sensitive areas lies at The Coast (4.5km to the east, with the Highland areas stretching from 7km to the northwest. The area around the site is then classified as a less sensitive Lowland and Hills area. These are indicated on Figure 5-1 and the baseline sensitivity to the type of change is summarised below in Table 5-4.

While there are further locally defined Areas of Landscape Significance (ALS) in Aberdeenshire at distances in excess of 15km and with a separate focus and orientation, there would be no notable visibility from these areas or potential for significant effect on views or the character and setting of these landscape and no further assessment is, therefore, necessary.

Also of note to the LVIA, a number of historic landscape features exist. In terms of the landscape setting (their visual and contextual relationship with their surroundings) there are two Conservation Areas (CA) within 5km, at Brechin and Brechin Castle at 4.5km to the northeast, where there could be potential for effect on the landscape setting. There is also one Garden and Design Landscape (GDL) connected with the Castle grounds.

These area lie at a relatively low point in the surrounding landscape with contained focus, backclothed by rising terrain to the southwest. Beyond 5km there is a further GDL at Kinnaird Park to the east between 5 and 8km. However, theoretically visibility is largely absent from this area and the potential for notable effect on views and the landscape setting would be limited given the combination of distance and scale of the intervening landscape. This is also the case for more distant CAs and GDLs beyond 7-8km. As a result no further assessment is considered, necessary. For detailed information on the historic landscape features refer to the Cultural Heritage Section (Section 8).

5.3.3 Landscape Character Resource

The character of the landscape context is defined within the SNH Review Tayside Landscape Character Assessment (LCA), SNH Review No.122, LUC, 1999. At 15km to the northeast the character is defined in the SNH Review No.102 South and Central Aberdeenshire LCA. These reports have provided a valuable benchmark for assessing landscape character. However, it should be noted that since publication, for some areas of the landscape, the baseline character is now very different. This is often as a result of (wind) energy developments and other infrastructure. Where the character has been modified in such cases, this has been noted within the assessment. This has also been recognised in with the SLCA, which provides further guidance on character and capacity.

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Within the study area and of relevance to the proposed development, within key areas of the ZTV, two principal Landscape Character Types (LCTs) are present (Figure 5-2), with sub areas locally defined as landscape character areas (LCAs). They include the Low Moorland Hills LCT (Montreathmont Moor.) and the Broad Valley Lowland LCT (Strathmore).

At other points of distance and within the fringes of the principal zones of the ZTV, other LCTs are present within the Highland Foothills LCT lying between 7.5km and 10km to the north, the Lowland Loch Basin (Montrose Basin) at 4.5-17km to the east and the Dipslope Farmland defining the area at 7.5km to 20km to the south.

Low Moorland Hills LCT

The proposed turbine is located within the Low Moorland Hills LCT. This LCT extends to cover much of its surrounding context up to 5km to the east, 10km to the west and 7.5km to the south. However, further analysis of the LCT within Angus Council's SLCA, defines "*two clearly different subtypes: the lower, flatter and significantly afforested Montreathmont Forest and Moor and surrounding farmland to the east of Turin Hill and north of Guthrie and the area of widely separated steep sided Low Moorland Hills in rolling farmland to the west, surrounding the east and south sides of Forfar*".

The proposed turbine is located within sub landscape character area (LCA) ii) Montreathmont Moor. Here the character is defined as distinctly different in character from the Forfar Hills sub area. The SLCA notes that:

"*The landform is predominantly gently undulating and gradually slopes down to the lower Montrose Basin LCA to the east. There are no distinctive hill landforms, although the northern edge forms an escarpment of some 100m descending to the River South Esk. It is a medium to large scale farming and forestry landscape dominated by Montreathmont Forest which is a distinctively large mature lowland forest dominated by coniferous planting. It is well populated by scattered properties and farmhouses in the farmland areas outside the forest, with a network of small roads.*"

The summary of landscape capacity and sensitivity is defined in the SLCA. It notes that "parts of the Low Moorland Hills have capacity for small groups of larger turbines up to 80m" This includes the proposed site, which lies within a defined area (Figure A of SLCA) which has the highest underlying capacity in Angus for wind energy development. This stretches from the sites context to the south across area 3) Montreathmont Forest and farmland to the south of Brechin. The capacity study defines these areas as having "the capacity to accommodate larger sizes of turbine and/or greater numbers and concentrations relative to other areas of landscape in Angus"

The landscape sensitivity of this sub LCT to change is considered to be Medium in the SLCA, with the simple topography, medium to large scale rectilinear pattern and extensive commercial forestry making it an area of a Medium to Low Landscape Character sensitivity. Views within are often screened by mature coniferous forestry although the area is highly visible from higher ground within and surrounding it giving it a Medium Visual Sensitivity.

The Forfar Hills sub-type of the Low Moorland Hills LCT lies at around 5km to the west. It has a much more complex and "varied landscape of small steep hills and ridges set within a wider area of medium scale rolling/undulating farmland". This sub area also has "higher visual sensitivity and complex, modest scale landforms compared with the sub-area further to the east". The SLCA note that it is of medium-high landscape sensitivity to wind energy development.

Surrounding Landscape Character Types

Given the elevation of the proposed turbine, it would have some influence over the surrounding Broad Valley Lowland LCT (Strathmore) and its sub area at the Lower South Esk and North Esk Valleys. This LCA extends to cover much of the surrounding context to the north up to 7.5km and beyond 15km to the northeast and northwest. This sub LCA is similarly dominated by arable farmland but has two significant rivers, a greater level of tree cover and more topographic variation than the Strathmore LCA. The landscape sensitivity of this sub LCT to change is considered to be Medium in the SLCA. There is also a further sub area ii) which includes the corridor of the South Esk between Glen Clova and Brechin. It "encompasses the meandering course of the river which is a focus to the landscape. It is generally characterised by a degree of topographic enclosure; more shelter and enclosure by mature trees, a number of large houses and designed landscapes".

Beyond these LCTs (and sub LCAs), even with some intermittent visibility from fringe areas of the Highland Foothills LCT, the Lowland Loch Basin and the Dipslope Farmland, the general distance, orientation and separation from the proposed site, would reduce the degree of visibility. This would also lessen the potential for notable influence with the key characteristics of the area, with no significant effect on landscape character anticipated. As a result no further assessment of these LCTs is considered necessary. A summary of the sensitivity to change is recorded below for the principal LCTs.

Non Designated Natural Heritage Areas

The SNH Policy Statement No 02/ 02 'Strategic Locational Guidance for Onshore Wind Farms in respect of the Natural Heritage', has identified different areas of natural heritage sensitivity across Scotland. The proposed development site and much of its surrounding context lies in a zone defined as having the 'Lowest' Natural Heritage Sensitivity to Wind Turbines (Map 5 within the guidance). This zone represents the "*…areas at the broad scale with least sensitivity to wind farms, with the greatest opportunity for development, within which overall a large number of developments could be acceptable in natural heritage terms, so long as they are undertaken sensitively and with due regard to cumulative impact*". This does not necessarily imply the absence of natural heritage interest, but with good siting and design it should however enable such localised interests to be respected

Table 5-4: Landscape Baseline Conditions

Character Type (SNH Review Vol 122)	Distance min/max)	Sensitivity to change
Low Moorland Hills LCT (Montreatmont) Low Moorland Hills LCT (Forfar Hills)	0-10km	Medium Medium – High
Broad Valley Lowland LCT (Lower S&N Esk)	0-20km	Medium
Designated Landscape		
Principal geographical areas - Coast	4.5-20km+	High - Medium
Principal geographical areas - Highland;	7-20km+	High -Medium
Historic Landscape (landscape setting)		
Brechin CA	4.5km	High
Brechin Castle GDL and CA	4.5km	High

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Application Site		
Landscape Fabric	0km	Medium

5.3.4 Visual Baseline Conditions

The purpose of the visual assessment is to identify from where and how it may be possible to see any part of the proposed development and to determine how this would affect the visual resource. The extent of visibility is firstly considered within the ZTV and then principally from a number of representative viewpoints that cover a broad range of sensitive viewpoints and represent both the different types of view and different types of viewer (ie visual receptors). Integral to this process is the need to define the sensitivity to change of the visual resource, which provides the baseline, against which the assessment of effects can be made.

Extent of Visibility

The computer generated ZTVs to hub height (40m) and blade tip height (67m) (Figures 5-3 to 5-4) identify areas of the landscape, from which the proposed wind turbine may theoretically be visible. This is in line with the Visual Representation of Windfarms, Good Practice Guidance (SNH). However it is important to note that ZTVs are tools for assessment and these are limited in several ways, including that, bare ground ZTVs make no allowance for any screening effects that may arise due to existing vegetation or built development (Figure 5-3). To limit this exaggerated impression, the significant areas of existing woodland have been modelled into the terrain model to provide a more realistic impression of anticipated visibility, using woodland areas identified on the 1:25k OS base (Figure 5-4). The real extent of the ZTV would also be influenced further, by the subtle variations of landform and landcover that are not covered by the digital terrain modelling data (DTM).

Key Visual Receptors

A range of visual receptors and receptor groups can be expected to be affected by the proposed development from both static and sequential points. These receptors will include, but not be limited to residents, travellers and those visiting the area for recreational, amenity and tourism purposes. The extent of the effect upon certain groups will then vary according to their level of sensitivity to the type of development. For ease of presentation the assessment identifies three key groups in line with the Angus Wind Farm Study: (1) local residents; (2) the travelling public; and (3) tourists /recreational visitors to the area. The baseline sensitivity of these groups is summarised in Table 5-1.

5.3.5 Representative Viewpoint Appraisal

The viewpoints presented within this report, represent a range of visual receptors and view types, and have been selected following SNH Guidance. The viewpoint photomontages have also been taken from a range of publically accessible points, to cover a representative range of viewing distances, elevations and orientations, with different viewing experiences. The micro-siting of viewpoints in the field has sought to maximise an open and clear view where available, whilst remaining tied to an identified 'key receptor group' for the viewpoint in question. A total of 10 viewpoints were selected for assessment and agreed in consultation with Angus council (Figure 5-3). The sensitivity to the change is summarised in Table 5.5.

Table 5-5: Representative Viewpoint Baseline

VP	Location	Grid Ref	Distance of View	Key Receptor Grp Static*/Sequential**	Sensitivity to change
1	White Myre	E357205, N757040	1.2km	Residents (south)	High
2	Angus Core Path 64, Burghill Wood	E359525, N758302	3.4km	Visitors (Angus Core path 064)**	High - Medium
3	A90 southbound (2km west of Brechin Castle Visitor Centre)	E355247, N759491	2km	Travellers **	Medium - Low
4	Brechin north – Pittendrich Road	E358646, N760759	4km	Residents (north)	High - Medium
5	A90 northbound Finavon	E349635, N757468	6.5km	Travellers **	Medium - Low
6	Turin Hill	E351468, N753547	6.3km	Visitors – hill walkers at summit*	High
7	White Cathertun	E354691, N765981	8.4km	Visitors – hill walkers at summit *	High
8	Minor Rd, Fithie / Rossie Moor	E363255, N754698	7.7km	Travellers **	Medium - Low
9	B9134 eastbound near Netherton	E355145, N757776	1km	Travellers **	Medium - Low
10	Flemington Tower Aberlemno (Cult Hert)	E352593, N755739	4km	Visitors (Cultural Heritage access)**	High - Medium

5.4 Construction Effects

Whilst there would be a degree of visual disturbance arising from construction activity, the proposals aim to minimise disturbance to the land itself and thought has been given to the detailed siting of the turbine in order to minimise potential disturbance to the physical landscape and the effect on sensitive views.

There would be some temporary effects on the landscape fabric of the site as the result of ground disturbance during construction, including minor earthworks for sections of the access track and the turbine base. These elements would not involve any removal of notable landscape features or characteristic elements and would be visually contained within the site context. Good site management plus reinstatement at the end of the construction phase will minimise the extent and duration of these effects. The magnitude of effect on the landscape fabric would, therefore, be Low. When combined with a Medium baseline sensitivity to the proposed change, the extent of effect is judged to be Moderate to Minor. All effects on the fabric are also considered to be substantially reversible in the long-term, following de-commissioning of the turbine.

With regard to the wider landscape character of the study area, it is anticipated that there would be no significant effect on the key characteristics of the surrounding LCTs until the later stages of construction when the turbines are more visible from these areas. These operational effects are dealt with separately in Section 5.6.

Mitigation Measures

The principal opportunity for incorporating mitigation into the scheme has evolved, during the scheme development, where a number of turbine options were considered.

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In relation to landscape and visual issues, the final size, location and turbine number was selected to limit visibility from the nearest sections of the landscape and imposition on residents. Thought was also given to avoiding any potential tree, vegetation or field boundary loss and the relationship with the emerging pattern of operational and consented schemes that overlook the Strathmore area.

5.5 Operational Effects

During the operational lifetime of the turbine, the principal landscape and visual effects would arise from the presence of the turbine and the movements of the blades. There would also be some activity connected with site works to build the control building, access track, underground cabling, crane pad and temporary construction and laydown area, with occasional vehicle movements required for maintenance but these are unlikely to be a significant factor.

5.5.1 Predicted Effects on Landscape Character

Low Moorland Hills LCT

The proposed wind turbine would be located within the Low Moorland Hills LCT (Montreathmont Moor LCA). This expansive LCT extends to cover most of the immediate landscape context, principally to the south. It is therefore the LCT most directly susceptible to the effects of the proposal.

As the ZTVs (Figures 5-3 to 5-4) indicate, there would be high theoretical visibility from the host LCT within 3-4km, extending across open farmland to the north of Montreathmont Forest. This is clearly focused on the local LCA of Montreathmont Moor, with notable forest cover screening visibility from wider sections of the LCA to the south.

While there would be some isolated points of extended visibility from hill summits to the west, the opportunity for notable visibility would be limited within the more sensitive sub LCA of the Forfar Hills area and its more complex, modest scale and distinctive characteristics. As a result there would be limited potential for notable effects on the landscape characteristics of this LCA and sub area of the Low Moorland Hills LCT.

Where the turbine would be visible, it would typically be seen across the open, gently undulating farmland and against a simple palette of medium to large scale characteristic elements within an expansive lowland area. While it would provide a notable new element in the immediate context along the north side of this LCT, and across the escarpment descending to the River South Esk "*the simple topography, medium to large scale rectilinear pattern and extensive commercial forestry*" as noted in the SLCA, all help to accommodate the profile of the turbine. It would, therefore, not be out of scale with the nature of its setting and would not fundamentally alter the balance of landscape characteristics within the wider context of the LCT. Nor would it notably affect the more sensitive visual points of the LCT or their setting, including the defined viewpoints at Finavon Hill, Angus Hill layby and Turin Hill, as noted in the SLCA.

The magnitude of change on the characteristics of the LCT is therefore considered to be Medium within 2km to the south and Low to Negligible elsewhere. When combined with a baseline sensitivity of Medium for the landscape the Montreathmont LCA, the extent of effect on the Montreathmont LCA is judged to be Moderate within 2km. Elsewhere, and from the adjacent Forfar Hills LCA, the extent of effect would be Minor to Negligible, with no significant effect on the general scale, simplicity and wider pattern of key characteristics of moderate value.

These tie in with the sensitivities and capacities noted in the SLCA and the guidelines which define the area as having "the highest underlying capacity in Angus for wind energy development" with " the capacity to accommodate larger sizes of turbine (up to 80m) and/or greater numbers and concentrations relative to other areas of landscape in Angus.

Effects on Surrounding LCTs

The ZTVs (Figures 5-3 and 5-4) indicate that there would be some intervisibility between the proposed wind turbine and the surrounding LCTs. From the nearest LCT along the Broad Valley Lowland LCT and its sub LCA, the Lower South Esk and North Esk Valleys, visibility would stretch across the nearest fringe sections of the LCA including the open farmland to the north and south of the South Esk river corridor. Visibility would then be largely absent from the lower strath areas, the actual river corridor of the South Esk and the more valued historic and settled sections of the area, but would again be present on the upper north strath slopes.

From these points, the proposed turbine would be observed at varying degrees to the rear of the escarpment slopes that form an adjacent backdrop to this LCT and enclose the strath. While it would form a skyline feature from isolated points between Brechin and the A90, it would sit within a clearly separate section of the wider landscape that surrounds the strath and importantly away from the focus and orientation of key characteristics within the strath farmland so as not to significantly impose on them. Most typically between the South Esk and A90 the turbine would also sit behind the notable enclosure pattern of woodland and coniferous forest. From the south side of the River Esk, where the key defining characteristics of the river corridor and its setting can be appreciated more fully, the turbine would sit more substantially to the rear of the notable change in landform associated with the adjacent LCT.

As a result the nearest sub area of this LCT and its key focus on the enclosed landscape around the meandering South Esk, would not be compromised to a significant degree. The restricted nature of most views is then evidenced by the photomontages and assessments from viewpoints 3-5 and 9), which demonstrate that the turbine relates clearly to the adjacent lowland hills LCT to the rear of this area.

At other elevated points to the north the turbine would sit into the surrounding landscape context associated with the expansive Montreathmont Forest and Moor area and would more typically be backclothed by these expansive large scale features in the landscape. This would help to contain the profile in the LCT.

In addition, from most points in this LCT the proposed turbine would also be seen in the wider context of other operational wind turbine influences, which have modified the elevated Strath character, principally to the north. As a result the proposed turbine would not form an entirely a new element in this stretch of the LCT, but would be seen as a similar scaled element to other influences, at similar elevated points within the LCT.

The magnitude of change on the characteristics of this nearest LCT is therefore considered to be Medium, across the transitional slopes within 3-4km between the A90 and Brechin. It would then be no more than Low elsewhere. When combined with a baseline sensitivity of Medium, the extent of effect is judged to be Moderate within 3-4km and Minor to Moderate elsewhere. This is summarised in Table 5-6.

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5.5.2 Landscape Designation

There are a number of national landscape designations within the wider study area, but none exist within the immediate context of the development in the Montreathmont Moor landscape. While there would be some visibility from the fringes of the nearest locally defined area within Angus, the Principal Geographical Area across the coast around Montrose Basin (Figures 5-3 and 5-4), the views would be notably outwith this area and to a separate low lying landscape context to the west. At these points, views would only be gained to the extended blade tip, which would only form a minor intermittent element in the distance. As a result there would be no significant change in the context from these areas and no potential for significant effects on the qualities for which this area has been designated. This would also be the case for the fringes of the highland area, as evidenced by viewpoint 7. The proposed turbine would not, therefore, undermine the integrity or setting of these areas, as noted in table 5-6.

The nearest section of the more sensitive areas lies at The Coast (4.5km to the east, with the Highland areas stretching from 7km to the northwest. The area around the site is then classified as a less sensitive Lowland and Hills area

5.5.3 Effects on Historic Landscape (Landscape Setting)

The majority of historic features within the study area are connected with the lower lying, settled sections of the surrounding Strathmore area. They are also situated at contained points, beyond the principal areas of ZTV (Figures 5-3 and 5-4). This would include the nearest CA and GDL at Brechin and Brechin Castle, which are substantially contained by vegetation patterns and landform variation. As a result there would be limited potential for effect on views and the landscape setting of these areas. The underlying nature, setting, sense of place and historical focus of these areas will thus remain intact with the turbine proposal being physically, culturally and visually separate. The potential effects on elements within these designated areas are discussed in more detail within the Cultural Heritage section.

5.5.4 Landscape Effects Summary

The assessment has shown that effects on the landscape and its characteristics would be limited in extent and significance. Where they do occur they are limited to the immediate open, farmland on the north side of Montreathmont Moor LCA, within 2km and then transitional fringes slopes connected with the Broad Valley Lowland within 3-4km between the A90 and Brechin. At these points the turbine would provide an intermittent focus, but would not dominate the underling balance of elements in the Strath landscape, with a range of other tall built influences in this section of the strath sides. As a result, there would be no adverse affect on the wider scale, focus, integrity or setting of key features in the surrounding landscape and it would not, be out of scale with other elements in the landscape. This is summarised in Table 5-6.

Table 5-6: Landscape Effects

Character Type	Sensitivity to change	Magnitude of Effect	Extent of Effect
Low Moorland Hills LCT (Montreathmont) Low Moorland Hills LCT (Forfar Hills)	Medium Medium – High	Medium (2km) Low -Negligible	Moderate (2km) Minor - Negligible
Broad Valley Lowland LCT (Lower S&N Esk)	Medium	Medium (3-4km)	Moderate (3-4km) Minor - Moderate
		Low	
Designated Landscape			
Principal geographical areas - Coast	High - Medium	Negligible	Negligible
Principal geographical areas - Highland;	High -Medium	Low -Negligible	Minor - Negligible
Historic Landscape (landscape setting)			
Brechin CA	High	Negligible	Negligible
Brechin Castle GDL and CA	High	Negligible	Negligible
Application Site			
Landscape Fabric	Medium	Low	Moderate - Minor

5.5.5 Principal Zones of Theoretical Visibility

As the ZTVs (Figures 5-3 and 5-4) illustrates, the principal zones of visibility would be concentrated across the open farmland to the north side of Montreathmont Forest. It would then stretch over more elevated open farmland within the Strathmore Valley, primarily between Brechin, Tannadice and Finavon. However, characteristic landcover and enclosure pattern would limit the extent of visual exposure, primarily to within 2-3km to the north, south and east and 4-5km to the northwest and northeast (Figure 5-4). It would then be further restricted from key stretches of the lower strath areas and the focus of valued aspects along the river corridors.

Visibility would then stretch over more intermittent points within the more distant Highland foot hills at Menmuir, to the north and to other fringe areas of dipslope farmland to the south, the elevated northern fringe of Rossie Moor and along the A934 to the south of Montrose Basin. At these distances the proposed turbine would be seen within wide open panoramic views which take in a range of varied urban and rural landscapes, including existing wind turbine influences at intervening points. Notable landform variation and coniferous woodland would then restrict visibility from much of the surrounding area, particularly around much of the lower lying settled areas within Forfar, Kirriemuir and Brechin.

5.5.6 Representative Viewpoint Effects

The analysis detailed in Table 5-7, refers to the potential visual effects on the 10 representative viewpoints identified in the baseline. To help understand the assessment, reference should be made to the existing panoramas, wireframes and photomontages (Figures 5-5 to 5-14), which illustrate the existing and proposed view.

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Table 5-7: Representative Viewpoint Effects

Location	Sensitivity	Visual Effect	Magnitude of Visual Change	Extent of Effect (Represented)
Viewpoint 1 - White Myre (access road)	High	From this near point to the southeast, the proposed turbine would be clearly visible within a broad, undulating panorama over the low moorland hills landscape (Figures 5-5a-c). In the view, the full blade diameter would be visible within the undulating farmland that defines the majority of the view, sitting to the rear of a local landform. While it would provide a clear distinctive element above the local and distant highland hills skyline, it would be seen in the context of a simple scaled undulating farmland which would help to anchor the turbine into the view. It would therefore be comparable in scale to the height of other features in the view including the woodland blacks to the west of the view. This would represent a medium to high magnitude of visual change. When combined with the baseline sensitivity from the key receptors of residents with a key view to the northwest at this isolated property, the extent of visual effect is considered to be moderate to major. Given the sparse coverage of residents the potential for other views and would be fairly limited.	Medium - High	Moderate – Major
Viewpoint 2 - Angus Core Path 64, Burghill Wood	High- Medium	From this point on a locally defined Core path at 3.4km to the east, the proposed turbine would be visible in a channelled view to the west, where it would sit in the mid distant view. While it would be observed with the tower, hub and blades visible above the small section of the distant skyline it would sit at a contained point in the view, where it would be observed in a sharp perspective with the edge of Burghill Wood and landform context at Craigend (Figures 5-6a-c). Both of these elements rise dramatically either side of the turbine in the nearer view to provide clear elements of scale and focus and structure in the view. Although it would be add a new reference into the view, it would also be seen in the context of the telecommunications tower at Craigend. These will help to accommodate the visual profile of the turbine and reduce the potential for scale contrast or overlap with the balance of elements in the view. The remained of the view context then stretches of the expansive Montreathmont moor area with few other notable landcover features. The magnitude of visual change is, therefore, considered to be medium. When combined with the baseline sensitivity from the key receptors of walkers at this point on the road between two core paths, the extent of visual effect is considered to be no more than moderate, from this point. From the remaining sections of the core path 64 the turbine would then be screened until it heads back onto a road at the west side of Burghill Wood.	Medium	Moderate
Viewpoint 3 – A90 southbound	Medium - Low	At this point on the A90 at 2km to the north, the proposed turbine would be visible to the rear of notable coniferous woodland which extends across the majority of the mid distant view to enclose the immediate focus and context of the view. At this point the hub and blades would be evident in the view just above the wooded skyline (Figures 5-7a-c). The remaining section of the tower would then be screened. It would therefore be observed in glimpsed views away from the direction of travel and as a background element in the wider view. As a result the magnitude of visual change is considered to be low. When combined with the baseline sensitivity from the key receptor group of travellers the extent of visual effect is considered to be moderate to minor. This would be the case for most sections of the A90 at Brechin for up to 4-5km to the east and much of the view from the west towards Finavon, woodland cover filtering most views.	Medium	Moderate - Minor
Viewpoint 4 - Brechin north – Pittendrich Road	High-Medium	From this point at 4km to the northeast, the proposed turbine would be clearly visible in a distant section of the open view to the west. It would be seen with the tower, hub and blades, sitting above the skyline, to the rear of intervening farmland, woodland and other settlement fringe structures and infrastructure along the A90 (Figures 5-8a-c). While the proposed turbine would be seen as a clear element, it would sit within an open, simple context at a lower point of the ridgeline that defines the south side of the view. It would also be seen with a range of other tall built structures including overhead pylons and telecommunications masts, which traverse both the lower view to the west and the escarpment ridge towards Montreathmont. These elements also run across more sensitive sections of the view towards higher hills summits at Finavon Hill. As a result these will help to moderate the magnitude of visual change, which is considered to be Medium. When combined with the baseline sensitivity from residents, beyond the curtilage and focus from the house, the extent of visual effect is considered to be moderate from this isolated point of Brechin. This type of view and effect would only stretch for around 150m before the view is screened. This will reduce the potent for notable effects from most other residents and other sensitive receptors within Brechin.	Medium- High	Moderate- Major
Viewpoint 5 - A90 northbound Finavon	Medium to Low	From this section of the A90 to the west, the proposed turbine would not be that discernible in the view. It would sit notably to the rear of mature woodland cover, which defines and encloses the lower view along the South Esk Valley in the mid to far distance (Figures 5-9a-c). While the turbine blades may intermittently appear above intervening woodland and be more evident during winter months, it would be observed at a distant point of the skyline and at a lower point to the sweeping scale of the Hill of Finavon, which would help to reduce the profile in the view. The underlying scale and balance of elements in the view would therefore be largely unaffected. The magnitude of visual change would therefore be low to negligible. When combined with the baseline sensitivity from the key receptor group of travellers on the A90 the extent of visual effect is considered to be minor to negligible. This would also be the case form most views from the A90, to the east with just isolated glimpsed views present.	Low - Negligible	Minor - Negligible
Viewpoint 6 - Turin Hill	High	From this notable high point within the eastern fringes of the Forfar Hills sub character area of the Low Moorland Hills, an expansive descending panorama stretches over the lower Montreathmont moor sub character area and on towards the higher Garvock hills to the northeast and highland foothills to the north. In this view the tower and blades of the proposed turbine would be visible within the lower farmland area, which extends to backcloth the turbine (Figures 5-10a-c). It would also sit entirely within this area with no notable overlap with the higher hill ridges to the northeast. Nor would it encroach upon the smaller steep hills and ridges around Turin Hill or	Low to Negligible	Moderate -Minor

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Location	Sensitivity	Visual Effect	Magnitude of Visual Change	Extent of Effect (Represented)
		other section of the Forfar Hills area. It would also be seen in the wider context of wind energy developments with prominent hill top developments siting to the northeast. This would represent a low to negligible magnitude of visual change. When combined with the sensitivity from the key receptor group of walkers with fixed views at the summit, the extent of visual effect is considered to be no more than moderate to minor.		
Viewpoint 7 - White Cathertun	High	From a notable high point at 8.4km to the north, the proposed turbine would not be that discernible, within the wider focus of this view. Although the hub and blades would be apparent in a small section of the view, the turbine would sit as a diminutive element to the rear of a local landform and would be further backclothed by landform and coniferous woodland (Figures 5-11a-c). It would then be observed in the context of open fields, wooded shelterbelts with a strong horizontal, linear emphasis and notable areas of coniferous woodland plantation, which provide elements of large simple landcover in the mid distant view. It would not interrupt any views to more distinctive landform summits or hill ranges nor overlap with the setting of the highland foothills in the near foreground. This would represent a low to negligible magnitude of visual change. When combined with the sensitivity of visitors to this point, the extent of visual effect is considered to be no more than moderate to minor.	Low - Negligible	Moderate -Minor
Viewpoint 8 - Minor Rd, Fithie / Rossie Moor	Medium - Low	From this point just off the A934, a broad descending view stretches over the wooded farmland and parkland of Kiniard Park on the west side of the Lowland Loch Basin area and across the notable coniferous woodland of Montreathmont Forest. In the view the proposed turbine would sit to the rear of this context in a small section of the view, with the blade diameter visible above evergreen woodland Figures 5-12a-c). From this distance and elevation, the turbine would then be entirely backclothed by the higher highland summits but away from the highest hill summits and peaks. It would in effect sit between the two landscapes and as a comparable built influence to a telecommunications tower to the east. As such the magnitude of visual change is considered to be low. When combined with the sensitivity from the key receptors of travellers, the extent of visual effect is considered to be minor. Although the sensitivity of local residents would be slightly higher, the focus of properties lies to the east at this point and the proposals would be peripheral to key views with no significant effect predicted.	Low	Minor
Viewpoint 9 - B9134 eastbound near Netherton	Medium to Low	From this local point to the west side of the site, the proposed turbine would be visible just to the rear of the broad, sweeping farmland hillside which defines and encloses the view to the south from this point (Figures 5-13a-c). In the view, the full blade diameter would be visible to the side of the local hill summit. While it would provide a clear distinctive element above the local skyline, it would be seen in the context of a simple scaled landform context which continues to ascend to a similar height to the turbine in the view. This would represent a medium magnitude of visual change. When combined with the baseline sensitivity from the key receptors of travellers with clearer views to the north, the extent of visual effect is considered to be no more than moderate. Given the sweeping nature and scale of the hillside notable views from residents in Netherton will be limited in extent and effect .	Medium	Moderate
Viewpoint 10 - Flemington Tower Aberlemno	Medium - Low	From this point on the access road to the cultural heritage site, a broad open view is gained over the low moorland hills and farmland to the north side of Montreathmont Forest and Moor. In the view the proposed turbine would sit to the rear of a flat topped moorland hill, with the tower, hub and blades visible in a distant section of the view Figures 5-12a-c). From this distance and elevation, the turbine would then sit to the lower side of a further hillside at Craigend and would appear nestled between the two, with the hub height sitting at a similar height to the hill tops. It would also be seen at a lower height than the overhead pylons which traverse the nearer hillside and with a telecommunications mast on the further hill so it would not entirely represent a new built element within the view. As such the magnitude of visual change is considered to be medium. When combined with the sensitivity from the key receptors of visitors on the access road to the tower, the extent of visual effect is considered to be no more than moderate. From local residents, the focus of properties lies away from the proposed turbine and the turbine would be peripheral to key views with no significant effect predicted.	Low	Minor

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5.5.7 Effects on Visual Receptor Groups

The extent of effect upon visual receptors would depend on the principal aspect and amenity value of the receptor and the orientation of key views, which in turn would depend on the existence or otherwise of intervening, landform, built elements and/or vegetation. The extent of effect would also depend on the distance from the proposed development, the mobility or static nature of the receptor and the potential for the development to attract the eye or to become a focal point in the view, to the detraction or benefit of competing visual elements. This would include the presence or absence of other comparable features, including existing wind farm elements.

5.5.8 Effects on Residential Amenity

The assessment of effects on residential amenity is an additional measure of visual effect, which can be related to LVIA. The usual approach to establishing the level of effect on residential amenity is to define the key orientation and focus of principal views for each property (or group of properties) within 1-2km, as these are fixed, constantly available views with a greater degree of amenity or value attached to them. This is recognised in GLVIA (3rd edition) which describes the susceptibility (or sensitivity) to visual change as a function of "*the occupation or activity of people experiencing the view at a particular location and the extent to which their attention or interest may be focused on the view*".

GLVIA also addresses residential amenity as "*residents at home, especially using rooms normally occupied in waking or daylight hours, that are likely to experience views for longer than those passing through*". Views from other points away from the principal, constant focus, and within the wider curtilage or from the general approach to the properties would, therefore, be less susceptible, as these views are secondary or peripheral to the amenity value and at sequential or transitory points.

Given the dispersed nature of the settlement pattern within the site context, only a very small number of residents would experience any notable direct views of the proposed turbine in key views from their property. These are likely to be greatest from isolated points within 1-2km, principally to the south, where direct, level, open views are available. They include properties at Whte Myre (Viewpoint1), House View House, Wandersheill, Balnacake, within 1km and at further points, Blibberhill, Stonybrigs. It would also include an ascending partial view from Broomknowe Cottages to the north.

While there is also likely to be potential for some effect away from the principal aspect of houses, within the wider curtilage and general approach to the properties at other points within 2km including Chapel Cottage, The Old School House, Mains of Aldbar and then from the north at Broomknowe, Balnabreich, Wesr Kintrockat and the north side of Netherton, as demonstrated by the viewpoint assessment (VP9), within views from the closer points being more restricted by landform and vegetation screening the view. Elsewhere views would be restricted from most other settlement clusters at Aberlemno, Tannadice and within Brechin.

The visual change as a significant effect in principal views from property would, therefore, be experienced by a relatively small number of people. When considered together, in line with GLVIA to help reach an overall conclusion on the community as a whole, the overall extent of effect on residential amenity is not considered to be significant.

Beyond these points the potential for notable visibility would be limited on property clusters and settlement, including Aberlemno and Tannadice and the main settlements of Brechin, Forfar and Kirriemuir. Where views are available at these further points, the turbine would be seen in more distant, peripheral expansive views alongside a range of other natural and built elements in the view. The effect from these more distant points would, therefore, not be significant.

5.5.9 Effects on Travellers

The ZTVs show that there would be potential visibility from intermittent points along the A90, between Finavon and Brechin, principally up to 10km. In reality, significant effects would be limited from the A90 given the level of roadside embankments and notable sections of intervening woodland cover. The turbine would therefore, only be seen in fleeting views as a minor peripheral element away from the direction of travel. Elsewhere the proposed turbine would be seen from minor roads surrounding the site. However, given the underlying landform variation and woodland cover, it would usually be seen to the rear of the immediate farmland context and in fleeting, peripheral views. From the nearest road to the north the B9134, the notable change in landform also restrict significant views. As such significant effects on travellers would be limited.

5.5.10 Effects on Visitors and the Tourism / Amenity Resource

This receptor group comprises a broad category with different objectives and, therefore, differing levels of sensitivity. A number of significant tourist areas, in the study area are located within the elevated highlands to the north or the low-lying settled landscapes and coastal areas to the east are as such, generally screened from the proposed development, with no notable effect predicted. This includes the local GDL's at Brechin Castle and Kinnaird Park, Montrose Basin and the Principal Geographic Areas across the coast and highlands Angus. Where views are available from other elevated hill tops including White Cathertun, the Hill of Finavon and Turin Hill the proposed turbine would normally be seen within broader, far reaching views, away from the immediate focus and setting of these points, to a separate, lower lying section of the landscape, with other human influences present. These also include other comparable wind turbine influences at other similar elevated points overlooking the Strathmore and Montreathmont context. The overall extent of effect on this receptor group is not considered to be significant.

5.5.11 Visual Effects Summary

The visual assessment shows that, geographically, the extent of significant visual effect is relatively low, being restricted to isolated points within 1-2km.

The detailed viewpoint assessment has indicated a reasonable picture regarding the significance of effects upon visual receptors. In EIA terms, there would be significant effects of Moderate to Major, at just one viewpoint at White Myre to the south. Moderate significant effects were noted from three viewpoints. One from a minor road as it passes the site, one from an isolated stretch of the a local core path and the third from a point on the approach to isolated residential properties on the north side of Brechin, with no significant effect on the key focus of views from within the property anticipated. No significant effects are predicted on key receptors at the remaining six viewpoints assessed.

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When considered together in line with GLVIA to help reach an overall conclusion on the level of significance on all relevant key receptor groups "*by aggregating properties as a way of assessing the effect on the community as a whole*", the overall effect on visual amenity is not considered to be significant. This is due to the relative sensitivity of the site context within the lowland area, the dispersed nature of receptors, as well as the size and location of the turbine within it.

5.6 Cumulative Effects Summary

The purpose of the cumulative assessment is to consider the potential effects upon the landscape and visual environments in relation to existing wind turbine developments and other known consented and proposed wind turbine developments in the area. It raises questions over thresholds of acceptable change (spatial and temporal) and the landscape's capacity to accept change. GLVIA (3rd edition, 2013) advises that "*cumulative landscape and visual effects result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future*".

Collectively, should all of the identified wind farms be built (Figure 5-15), they would provide an intermittent built influence at elevated points in the surrounding landscape. The emerging focus of this pattern within 10-15km, lies at elevated points within or adjacent to the Strathmore area. They include key locations, on the elevated north strath slopes or higher Menmuir Foothills section of the highlands to the north. They also include the Muir of Pert to the east of Brechin and at isolated points within the Montreathmont Forest and Moor Area as shown in Figure 5-15. This links in with the SLCA guidance for steering development in this area. The SLCA also notes that the site context has "the highest underlying capacity in Angus for wind energy development" with "the capacity to accommodate larger sizes of turbine (up to 80m) and/or greater numbers and concentrations relative to other areas of landscape in Angus.

As the ZTVs indicate (Figures 5-16a-b), the theoretical cumulative exposure of existing wind farm developments, will be varied. The four developments at Balhall Lodge, North Mains of Conosyth, Arrat Farm and East Pitforthie, will all be visible across the open farmland that surround the development site on the north side of Montreathmont Forest. Their visibility will also be, at times more extensive than the proposed turbine and stretch to more sensitive highland and lowland areas, including the coast and highland geographical areas. In addition there will be intervisibility across the Strathmore valley areas to the west of Brechin. The proposed turbine would therefore, rarely add to the existing extent of visual exposure and seldom provide a new defined element into the landscape resource. It would, however, sit at a sufficient distance from the nearest operational turbines, in excess of 7km, so as not to significantly change or alter the underlying balance of elements in the landscape and visual resource. The cumulative landscape and visual effect of the proposed turbine, in combination with other existing developments would not, therefore be significant, with no extensive visible overlap or complexity in developments from the vast majority of views in the surrounding landscape and only a moderately strengthened element locally.

When considered further with the consented schemes(Figures 5-17a-b), there would be higher potential for combined theoretical visibility with the two schemes at Dunswood and East Memus, with all three schemes visible across key sections of the Montreathmont Moor LCA and surrounding Strathmore valley along the Lower South and North Esk river Valleys. Combined theoretical visibility would then be reduced with the developments at Balrownie and Pickerton, given the more notable influences of intervening landform and landcover features. The proposed turbine would, therefore, contribute a modest addition to the pattern of individual wind turbine elements that sit at the upper strath slopes or just within the fringes of adjacent landscapes. The potential for notable change in the balance of characteristics and change in the nature of the view would again be limited though, given the broad, open context of the underlying landscape and clear separation of developments at a minimum of 6km.

This is evidenced by the cumulative wireframes, which demonstrates a clear separation of single wind turbine elements in expansive views along or across the strath landscape and cumulative views being successional rather than combined from the majority of places. The overall cumulative effect of the proposed turbine, in combination with other existing and consented developments is not, therefore, considered to be significant with no overlap, complexity or concentration in developments from the vast majority of the surrounding landscape.

There are then several further single turbine schemes in planning with one or two in the Montreathmont Moor LCA and several scattered at further elevated points of the Broad Valley Lowland along Strathmore. Of note to the development there would be a higher potential combined theoretical exposure with the developments to the south at Cotton of Pitkennedy Farm, Bolshan Farm. However, the potential for notable conflict in the local character of Montreathmont Moor and change in the balance and nature of views, with these turbines would be limited. This is due to the clear separation and focus of these developments within a landscape defined by "simple topography, medium to large scale rectilinear pattern and extensive commercial forestry".

The potential for additional effect on the landscape and visual resource arising from the proposed single turbine at Netheron, would not therefore be significant, with a clear separation to other developments, limited visual complexity and overlap and a location which fits with both the emerging pattern of operational and approved development and is in accordance with the capacity guidance in the SLCA.

5.7 Summary

Following the LVIA, it is considered that both the scale of the turbine proposed and its location, within the Montreathmont Forest and Moor LCA are both appropriate. While it would introduce a wind turbine element into the open farmland on the north side of the forest area and would be seen from the nearest section of the adjacent strath, it would largely form a modest built element which is comparable to other tall built elements in this section of the landscape and would be seen against a large simple pattern of topography and landcover elements. The location and character of the receiving environment, therefore, has the ability to accommodate this change with a reasonable effect on the wider landscape and visual resource, whilst limiting the potential for effect from more valued, low lying settled areas and more remote highland areas to the north.

Furthermore, whilst there will be acknowledged changes in the local landscape, these will be completely reversible and temporary given the turbine's anticipated life span.

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5.8 References

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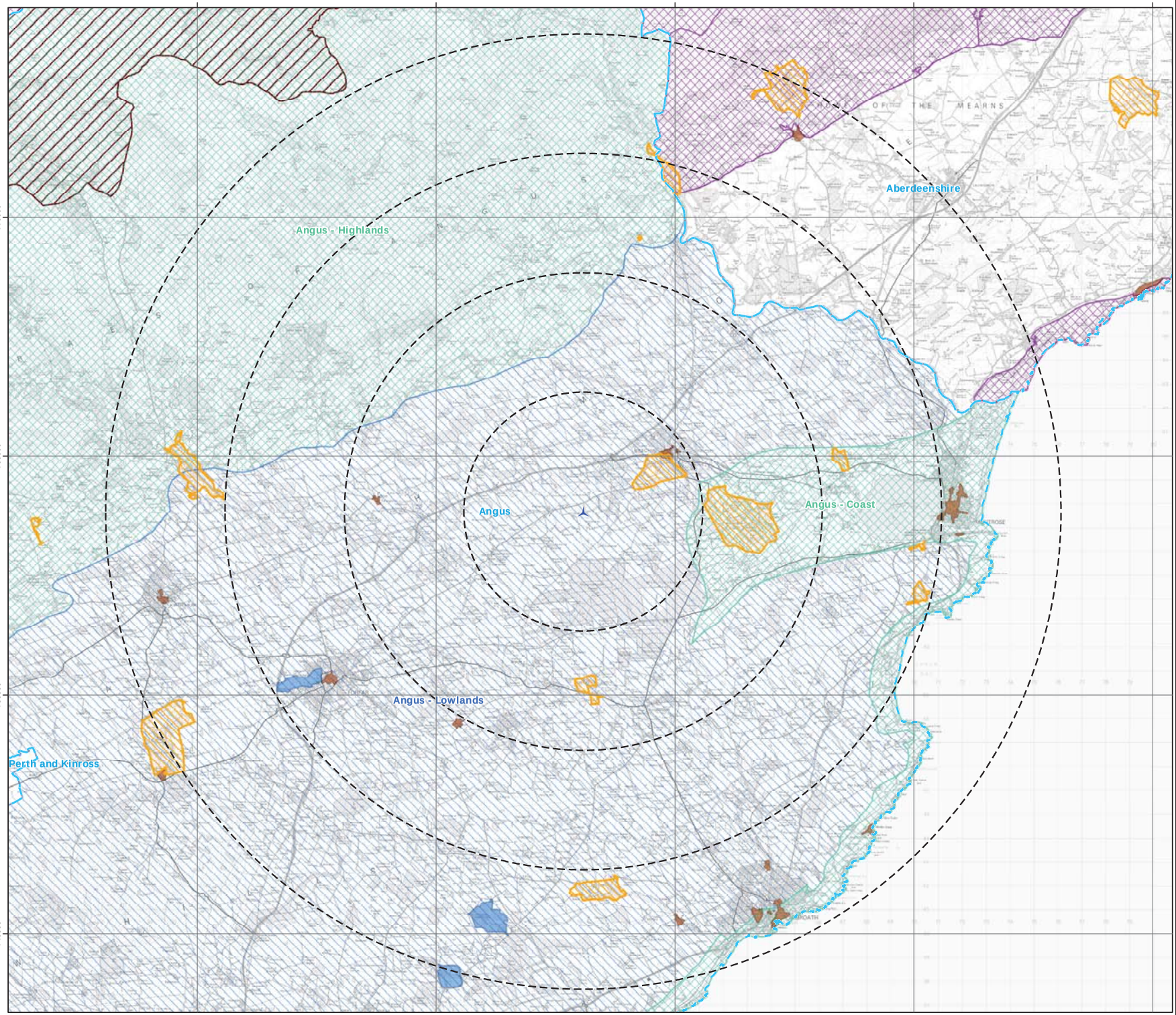

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-1
Landscape Policy Context

Key

- Turbine location
- 5km turbine radii to 20km
- Council boundary
- Garden or Designed Landscape
- Country Park
- Conservation Area
- National Park

Council Landscape Designation

- Aberdeenshire - Area of Landscape Significance
- Angus - most sensitive Principal Geographic Areas
- Angus - less sensitive Principal Geographic Areas

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0 2.5 5
Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/LS/008a

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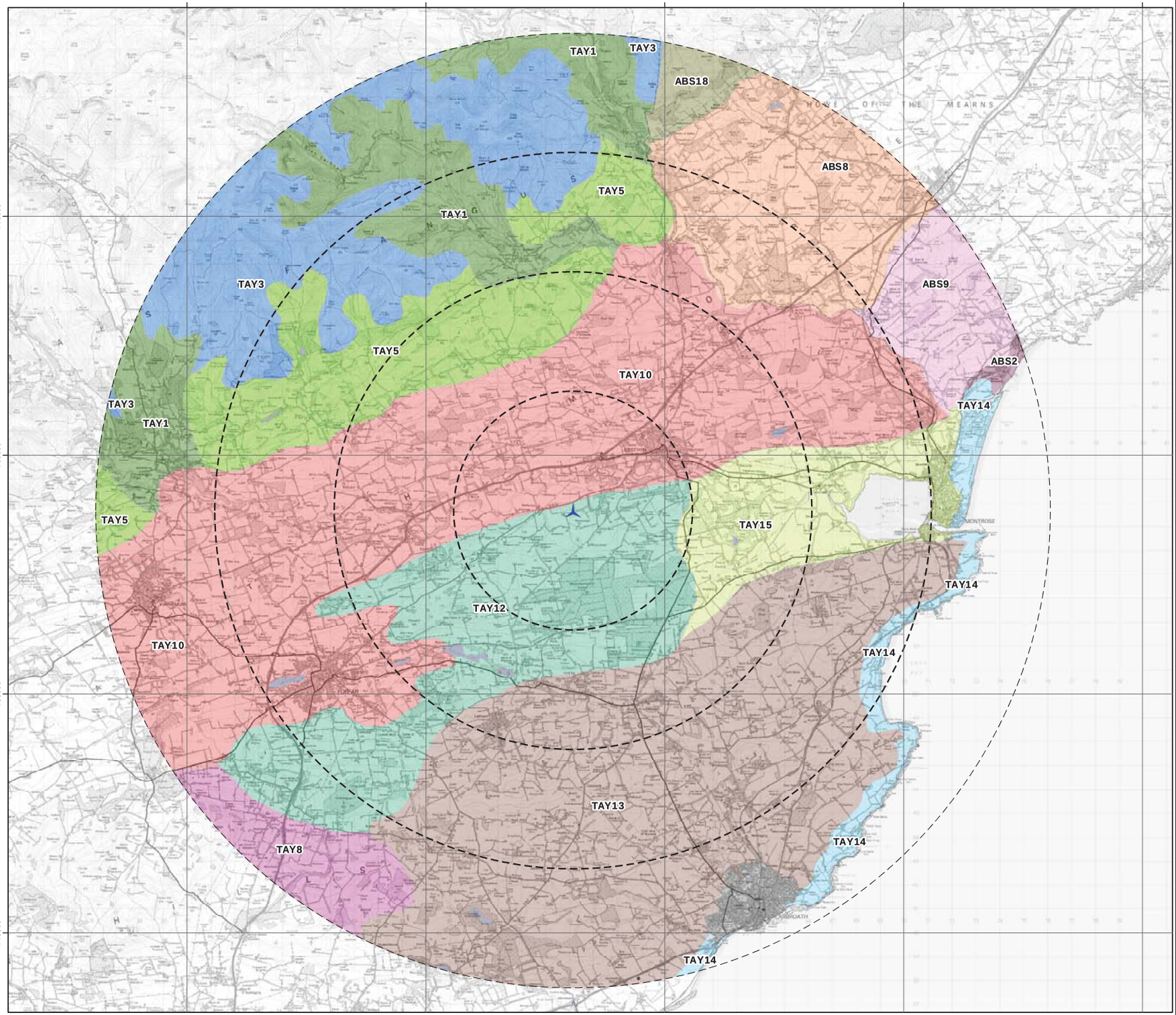

Netherton Wind Turbine

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Figure 5-2
Landscape Character Type

Key

- Turbine location
- 5km turbine radii to 20km
- Council boundary

Atmos LCA selection

- ABS2 - Coastal Strip
- ABS8 - Agricultural Heartlands
- ABS9 - Agricultural Heartlands
- ABS18 - Moorland Plateaux
- TAY1 - Highland Glens
- TAY3 - Highland Summits and Plateaux
- TAY5 - Highland Foothills
- TAY8 - Igneous Hills
- TAY10 - Broad Valley Lowland
- TAY12 - Low Moorland Hills
- TAY13 - Dipslope Farmland
- TAY14 - Coast
- TAY15 - Lowland Loch Basin
- LOCH - Inland Loch & Loch Island
- URBAN - Urban areas

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0 2.5 5 Kilometres

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Scale @ A3: 1:150,000

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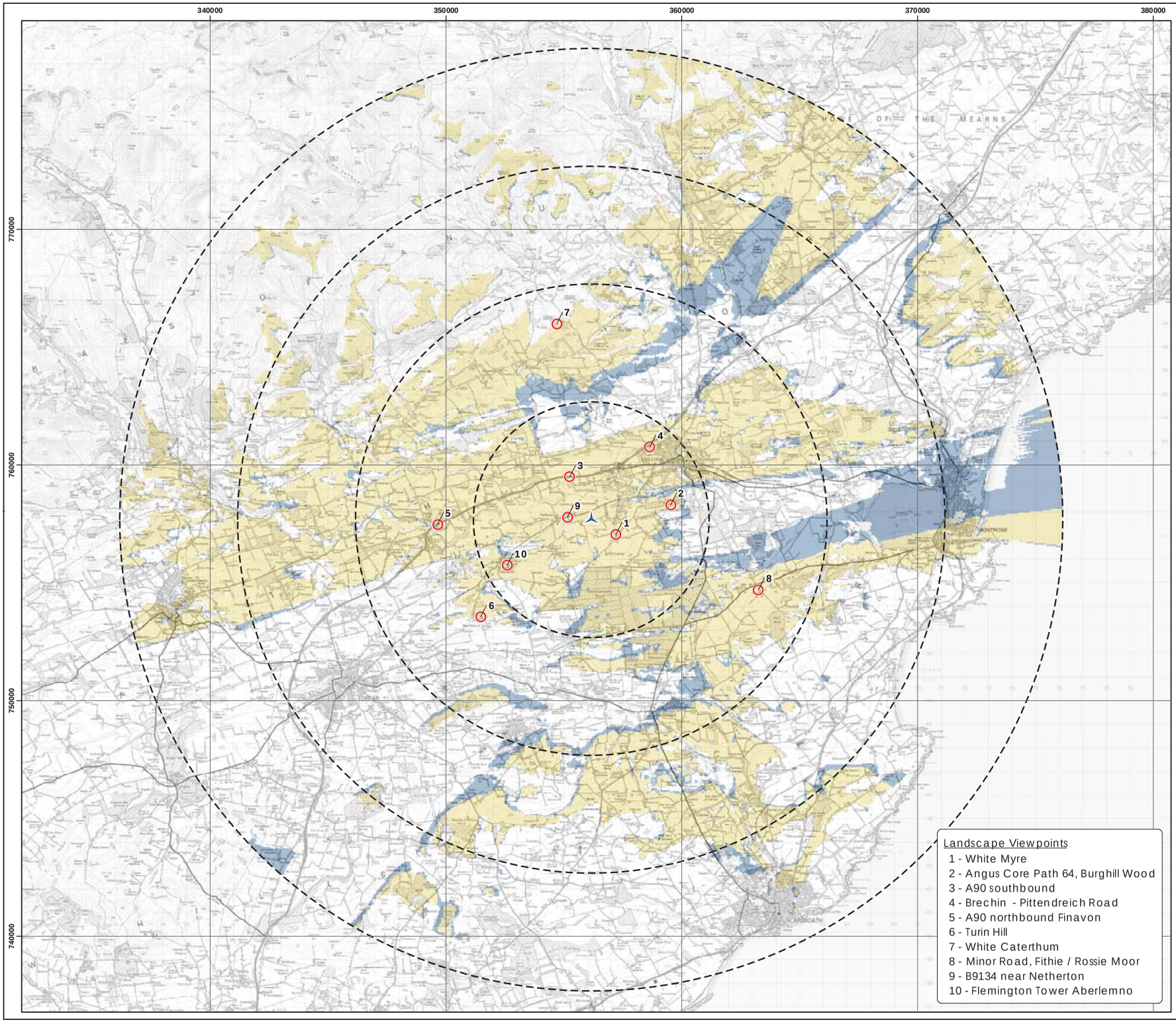

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Figure 5-3
Bare Ground Blade Tip and Hub ZTV and Viewpoints

Key

- Turbine location
- 5km turbine radii to 20km
- Landscape Viewpoint

Zone of Theoretical Visibility

- 40m hub visible
- 67m tip visible

Landscape Viewpoints

1 - White Myre
2 - Angus Core Path 64, Burghill Wood
3 - A90 southbound
4 - Brechin - Pittendreich Road
5 - A90 northbound Finavon
6 - Turin Hill
7 - White Caterthum
8 - Minor Road, Fithie / Rossie Moor
9 - B9134 near Netherton
10 - Flemington Tower Aberlemno

Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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0 1.25 2.5 5
Kilometres

N

Scale @ A3:
1:150,000

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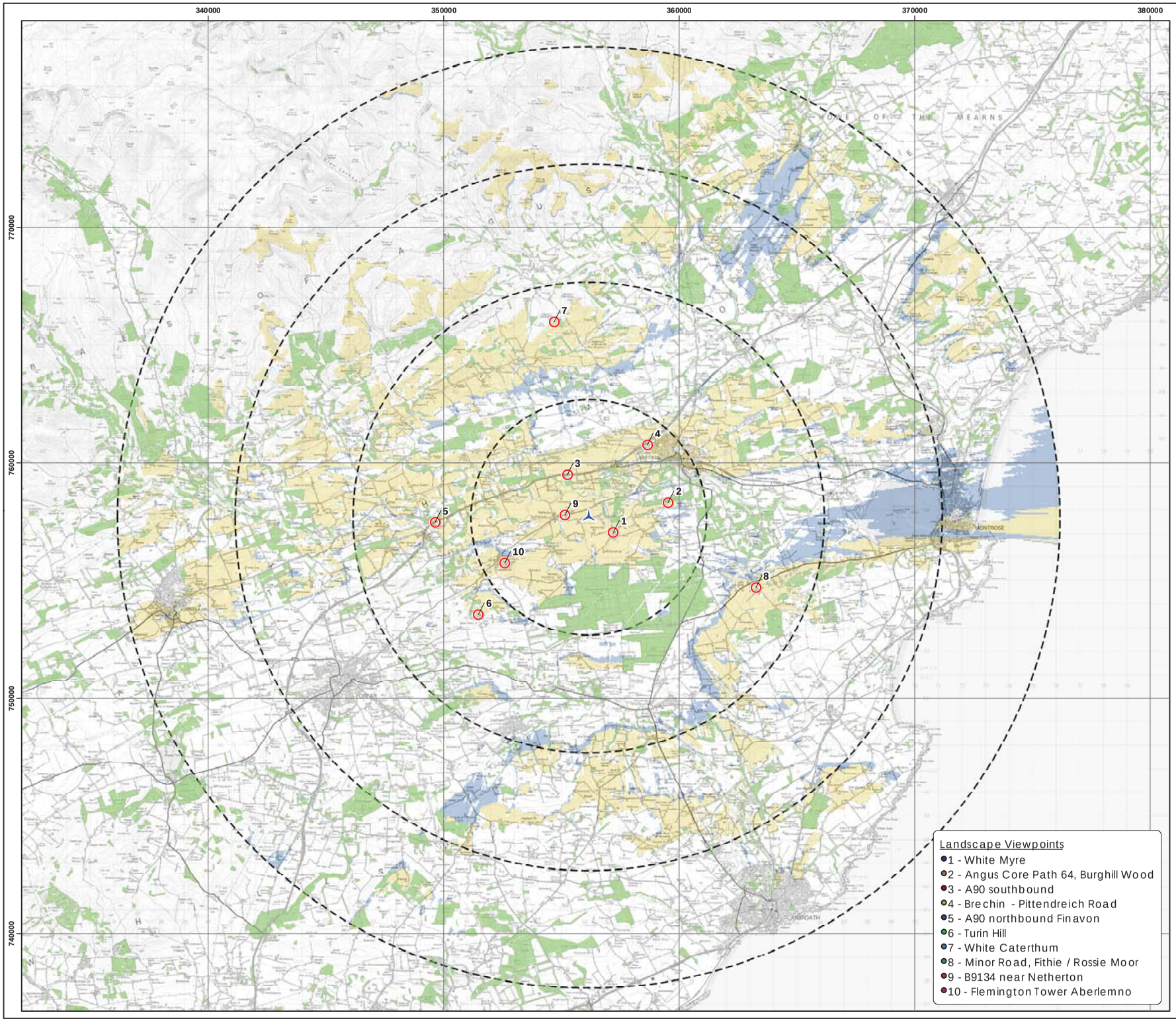

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-4
Screened Blade Tip and Hub ZTV and Viewpoints

Key

- Turbine location
- 5km turbine radii to 20km
- Landscape Viewpoint
- Forestry

Zone of Theoretical Visibility

(10m forestry screeing effect)

- 40m hub visible
- 67m tip visible

Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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0 1.25 2.5 5
Kilometres

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Scale @ A3:
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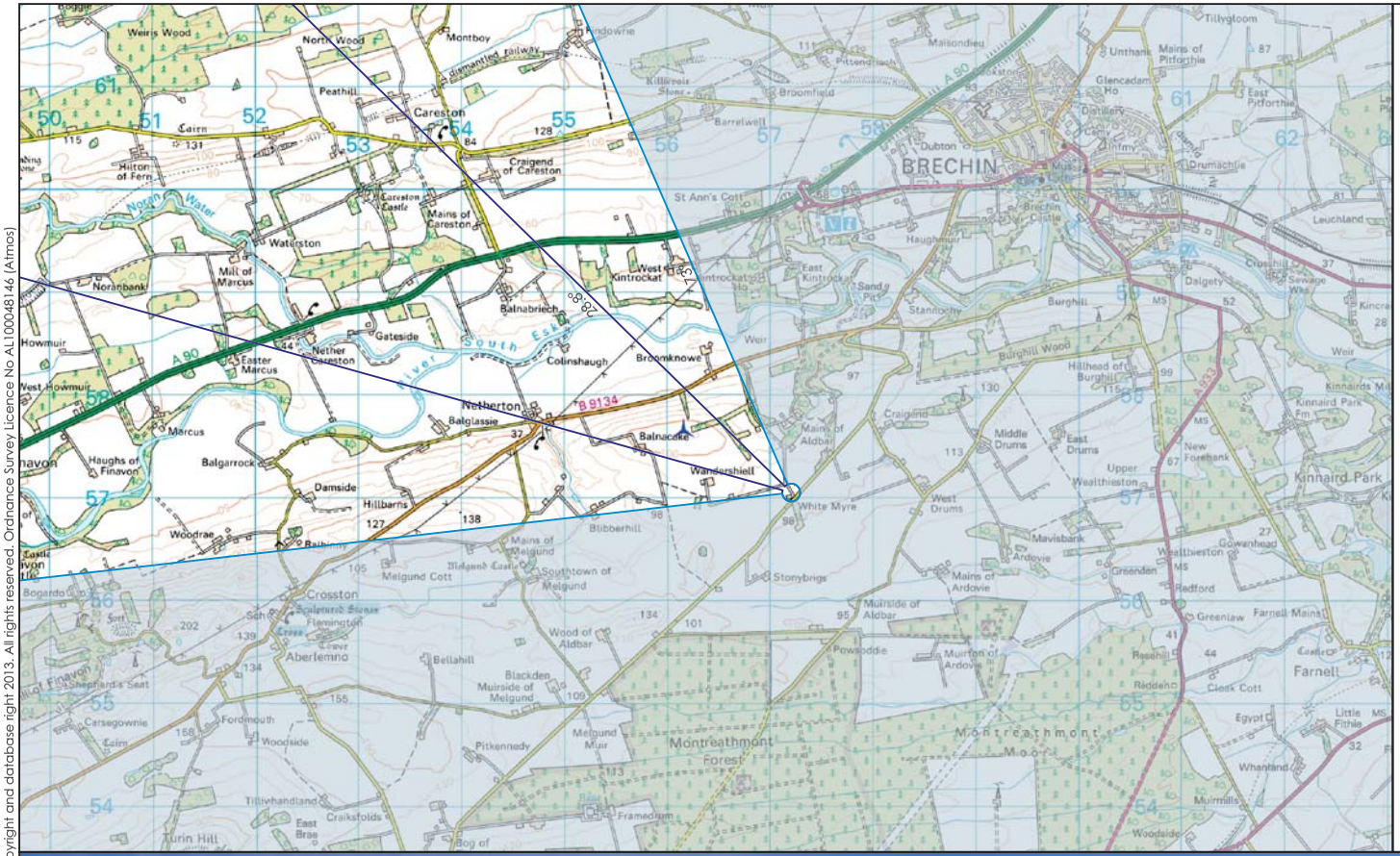

Netherton Wind Turbine

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Figure 5-5a
Viewpoint 1 - White Myre

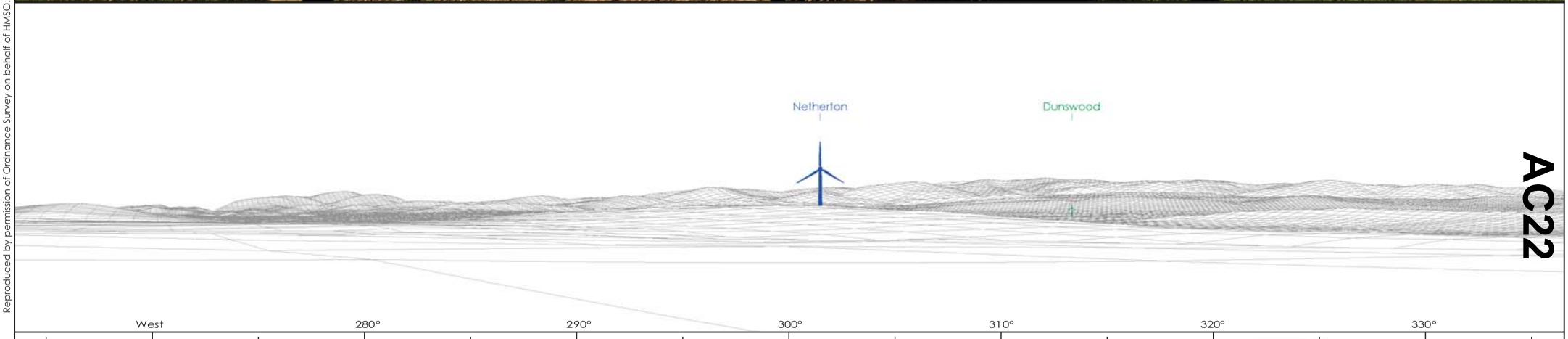
Viewpoint Data	
Grid Reference	E357205, N757040
Elevation	98m AOD
Wireframe/Photograph	
Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens
Proposed Turbine Information (Netherton only)	
Hub Height	40m
Blade Tip Height	67m
Predicted Wireframe Turbine Visibility (Netherton only)	
Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	1,223m

0km 3km
Scale 1:50,000@ A3

Wide Angle Photo of Existing View | Included Angle 110° | Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

Drawn by	JM
Checked by	TP
Approved by	NT
	TI01c
	10/02/2014
	4611_PM_C011b



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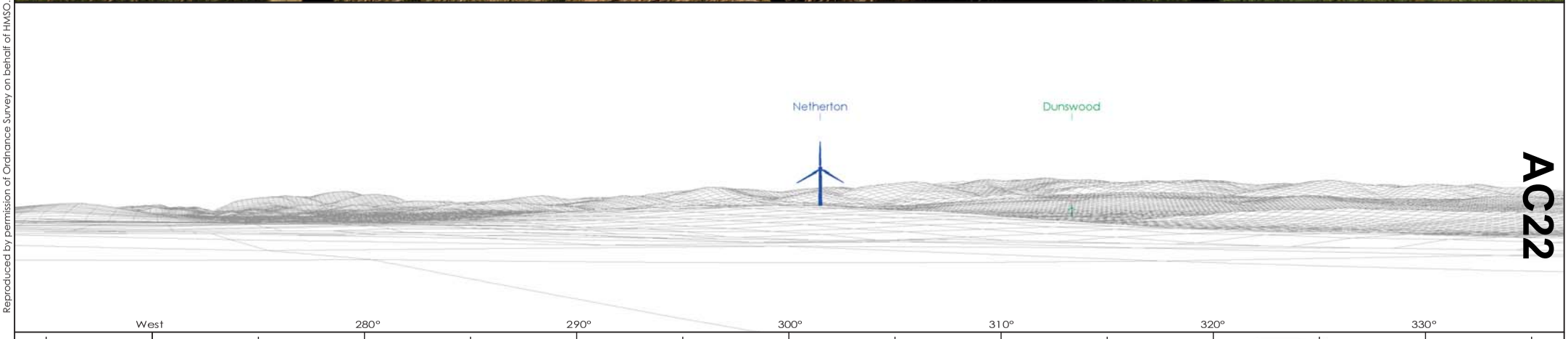
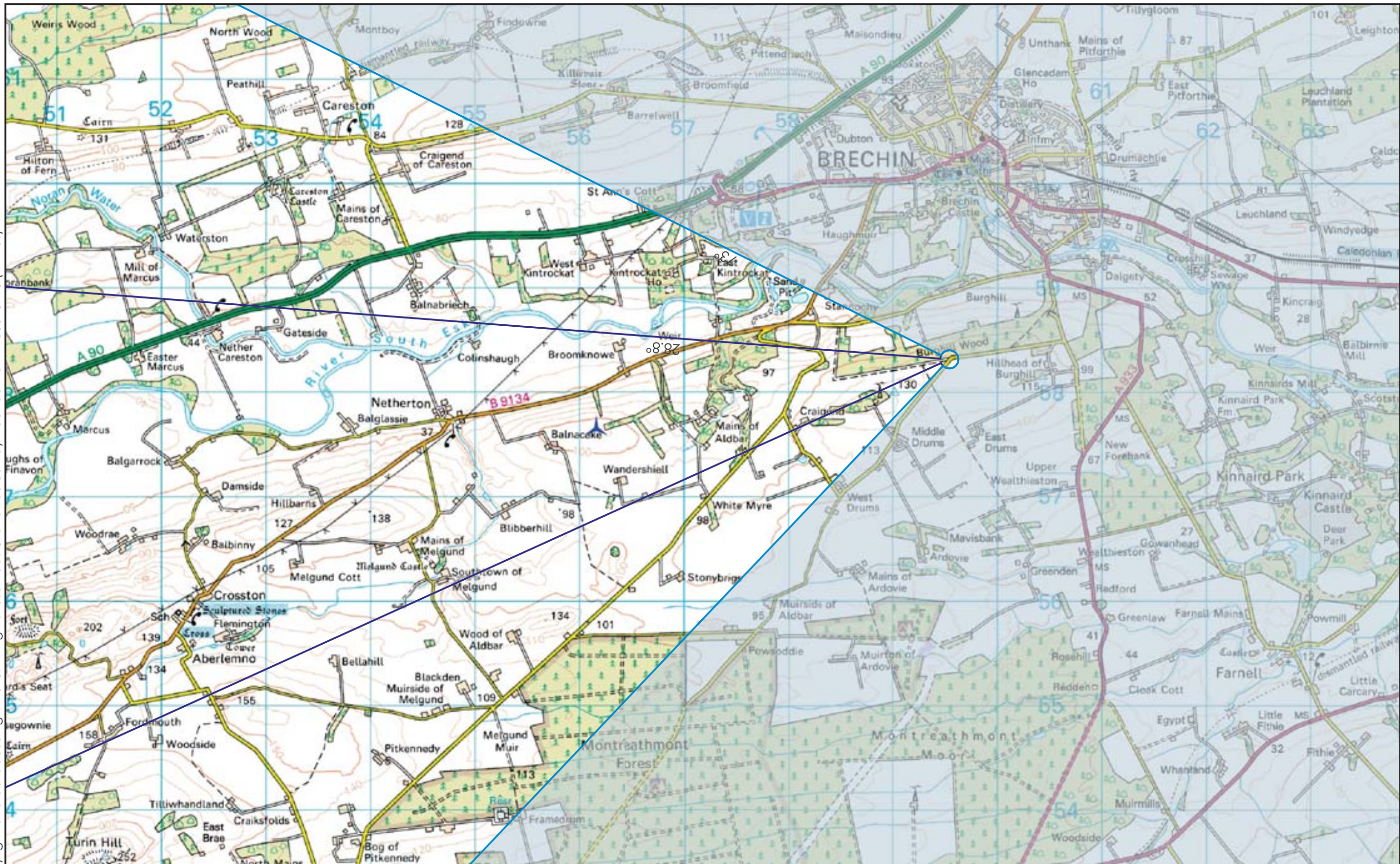
atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 1: White Myre	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-5b		Drawn by JM TI01c Checked by TP 10/02/2014 Approved by NT 4611_PM_C011b



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 1: White Myre	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-5c		Drawn by JM TI01c Checked by TP 10/02/2014 Approved by NT 4611_PM_C011b

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 1: White Myre	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-5d		Drawn by JM TI01c Checked by TP 10/02/2014 Approved by NT 4611_PM_C011b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

atmos CONSULTING

Figure 5-6a
Viewpoint 2 - Angus Core Path 64, Burghill Wood

Viewpoint Data	
Grid Reference	E359525, N758302
Elevation	123m AOD
Wireframe/Photograph	
Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens
Proposed Turbine Information (Netherton only)	
Hub Height	40m
Blade Tip Height	67m
Predicted Wireframe Turbine Visibility (Netherton only)	
Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	3,421m

0km 3km
Scale 1:50,000@ A3

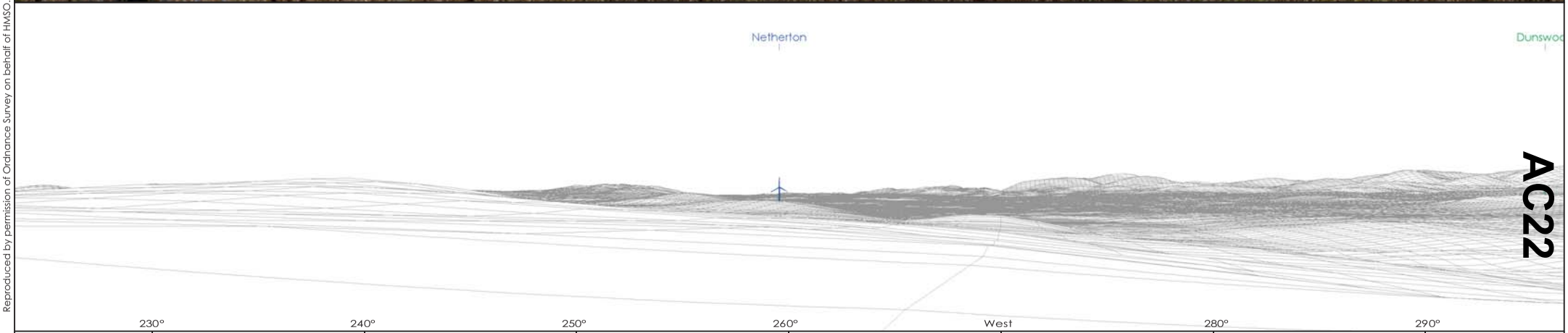
▼ Wide Angle Photo of Existing View   Included Angle 110°   Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

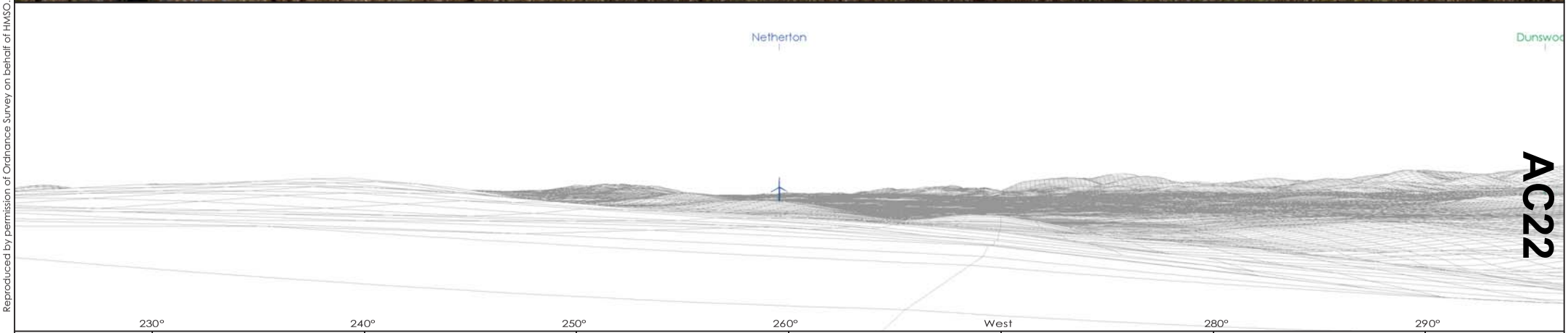
Drawn by JM
Checked by TP
Approved by NT

TI01c
10/2/2014
4611_PM_C012b

Existing View

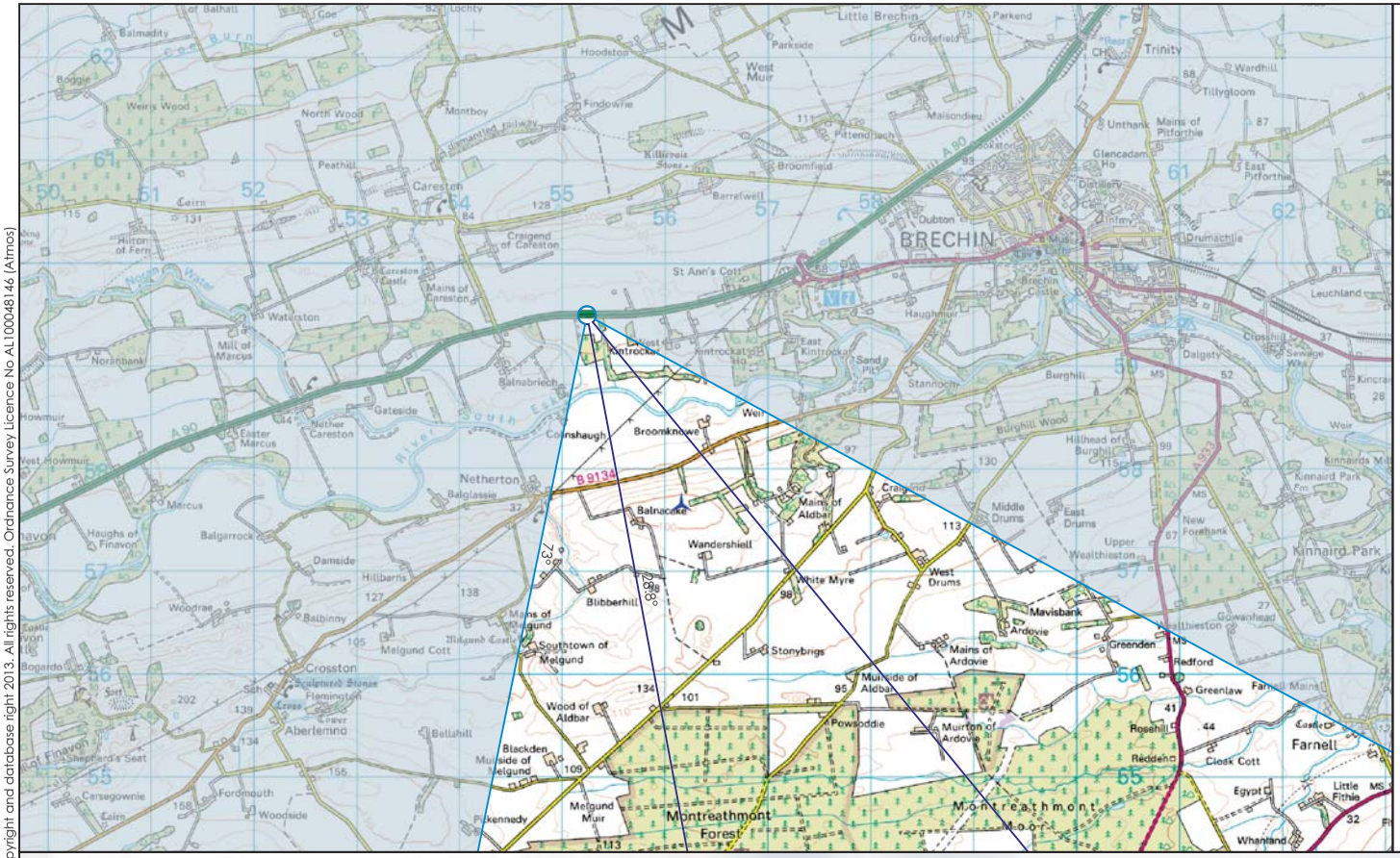


atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 2: Angus Core Path 64, Burghill Wood	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-6b		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C012b



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 2: Angus Core Path 64, Burghill Wood	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-6c		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C012b

atmos CONSULTING	**Polar Energy (Netherton) Ltd**	**Netherton Wind Turbine**	Viewpoint 2: Angus Core Path 64, Burghill Wood	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-6d		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C012b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

atmos CONSULTING

Figure 5-7a
Viewpoint 3 - A90 southbound

Viewpoint Data

Grid Reference	E355247, N759491
Elevation	55m AOD

Wireframe/Photograph

Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens

Proposed Turbine Information (Netherton only)

Hub Height	40m
Blade Tip Height	67m

Predicted Wireframe Turbine Visibility (Netherton only)

Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	2,031m

0km 3km

Scale 1:50,000@ A3

Wide Angle Photo of Existing View | Included Angle 110° | Approximate Viewing Distance 210mm

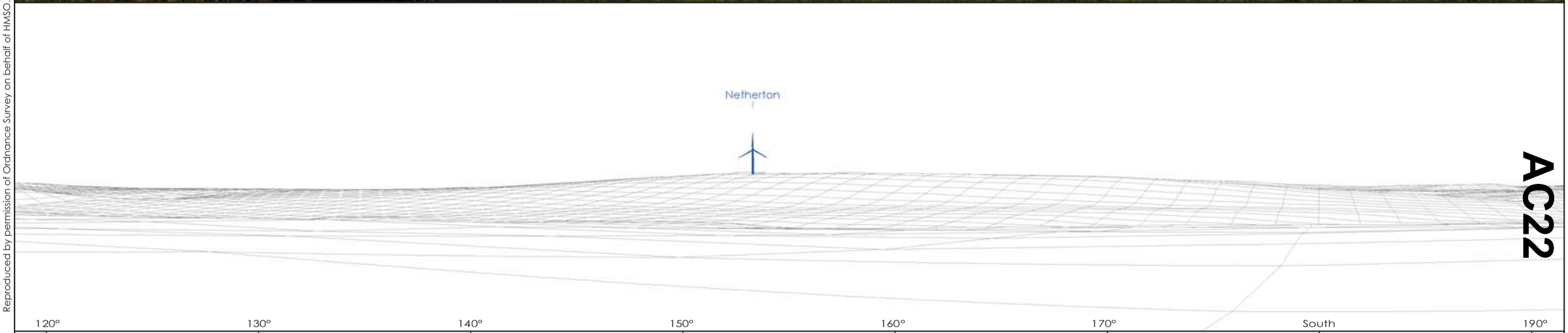
AC22

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

Drawn by	JM
Checked by	TP
Approved by	NT

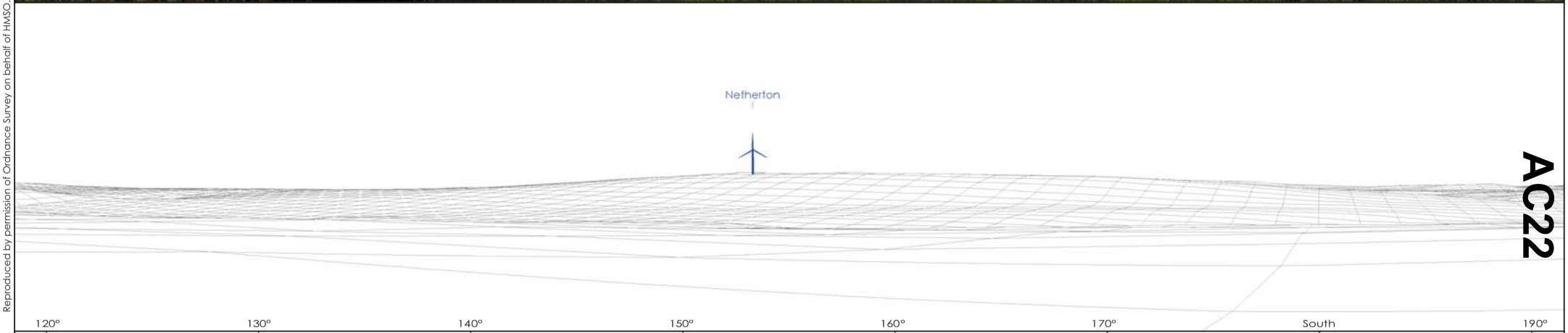
TI01c
10/2/2014
4611_PM_C013b

Existing View



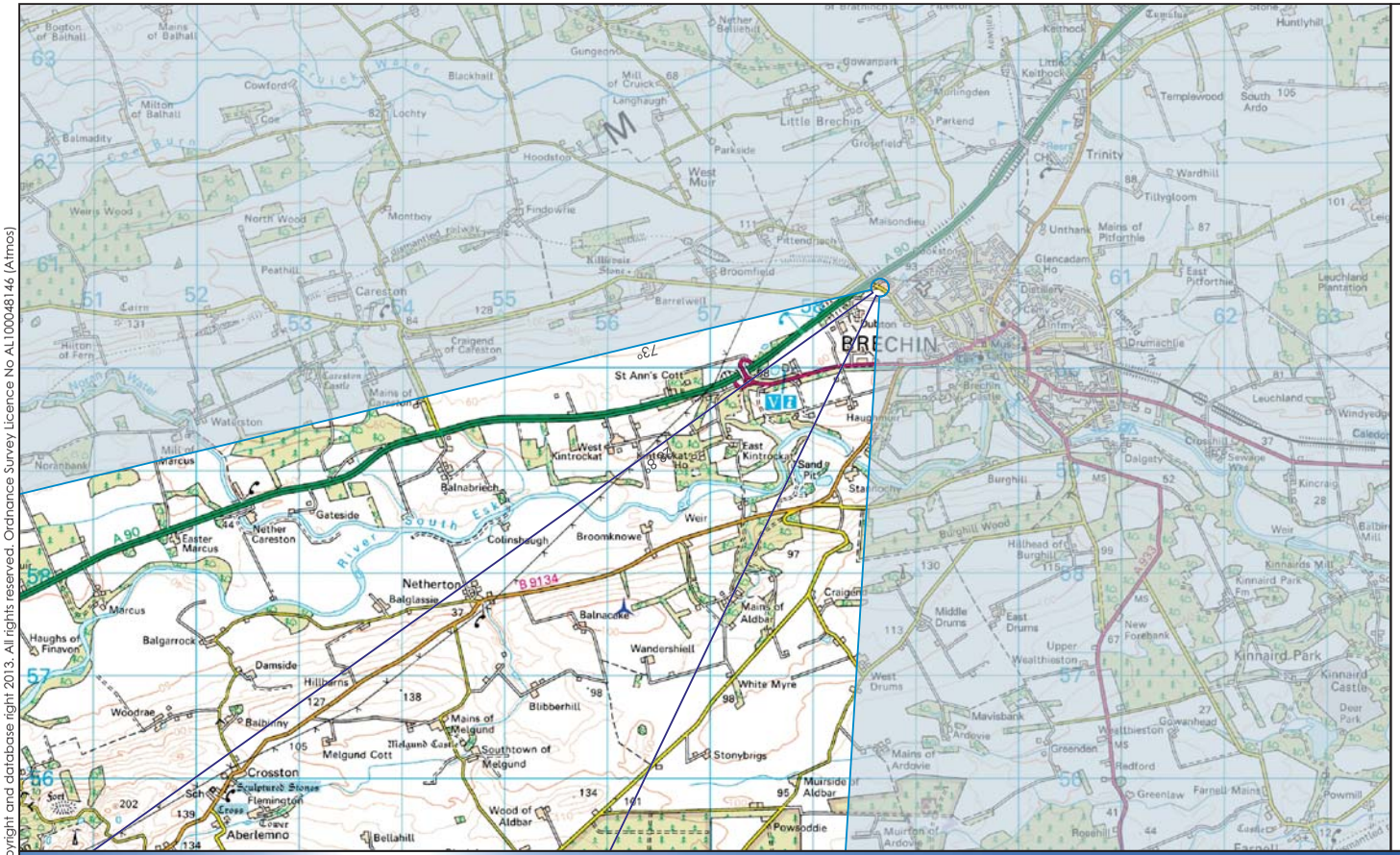
atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 3: A90 southbound	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-7b		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C013b

Existing View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 3: A90 southbound	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-7c		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C013b

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 3: A90 southbound	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-7d		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C013b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

atmos CONSULTING

Figure 5-8a
Viewpoint 4 - Brechin - Pittendreich Road

Viewpoint Data

Grid Reference	E358646, N760759
Elevation	79m AOD

Wireframe/Photograph

Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens

Proposed Turbine Information (Netherton only)

Hub Height	40m
Blade Tip Height	67m

Predicted Wireframe Turbine Visibility (Netherton only)

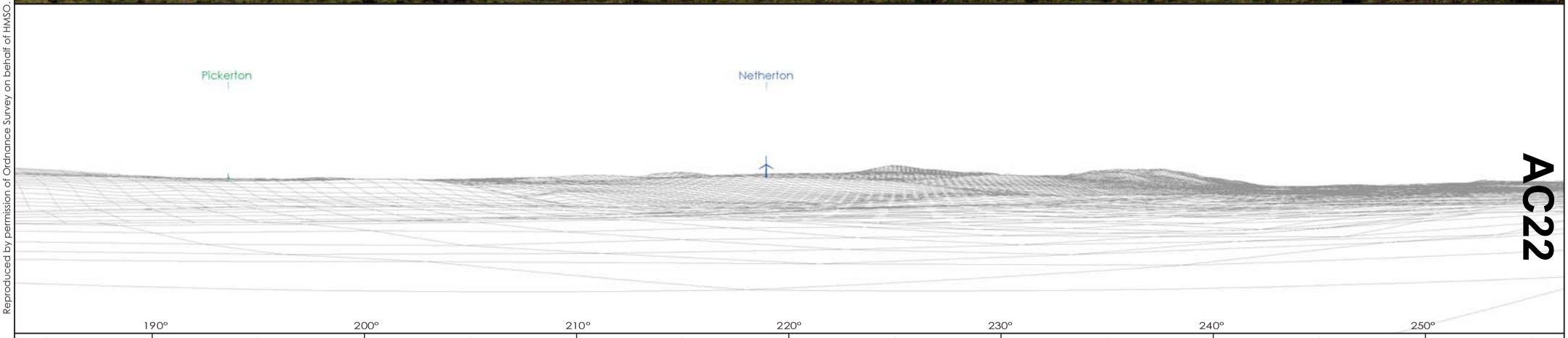
Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	3,958m

▼ Wide Angle Photo of Existing View Included Angle 110° Approximate Viewing Distance 210mm

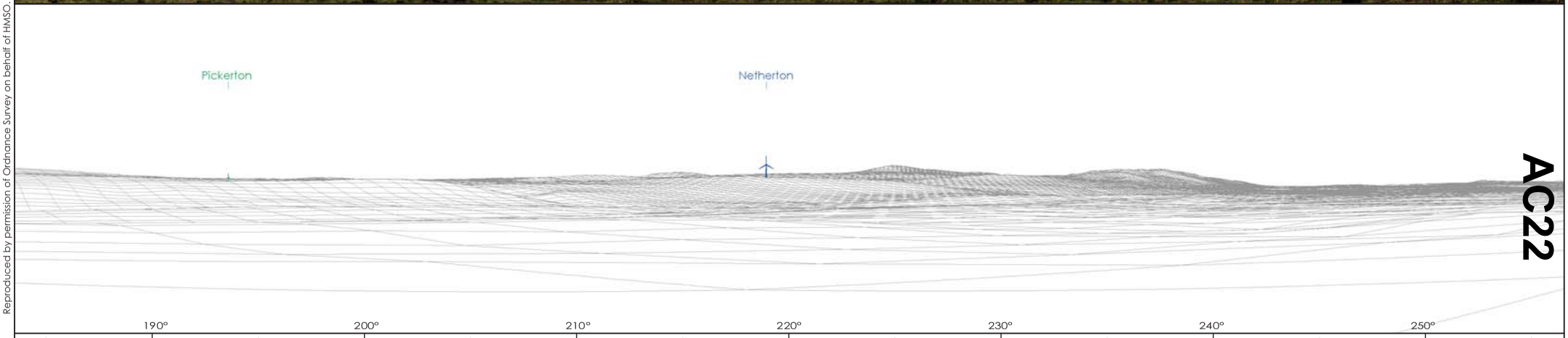
The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

Drawn by	JM
Checked by	TP
Approved by	NT
	TI01c
	10/2/2014
	4611_PM_C014a

Existing View

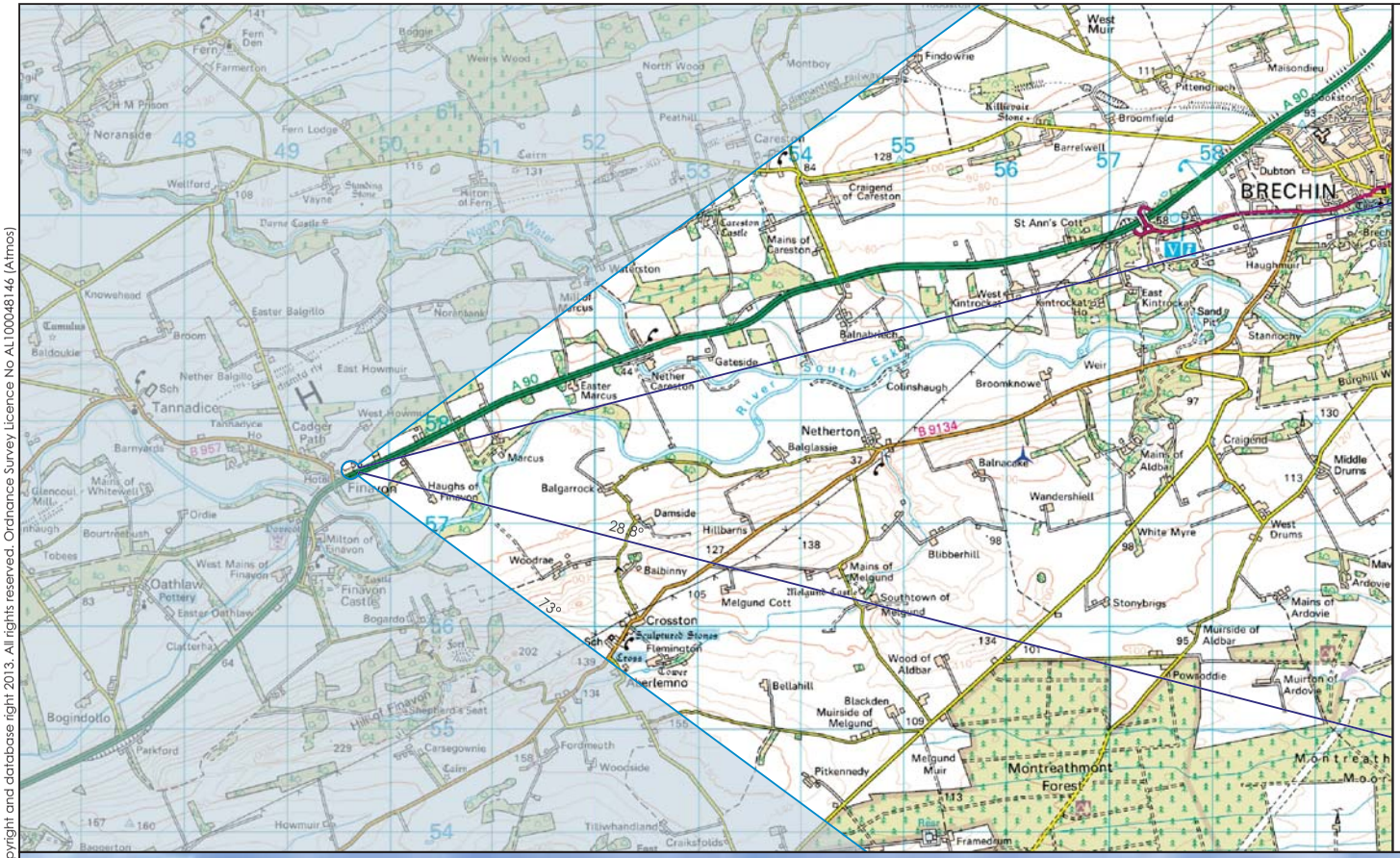


atmos CONSULTING	Polar Energy (Netherton) Ltd	**Netherton Wind Turbine**	Viewpoint 4: Brechin - Pittendreich Road	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-8b		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C014a



atmos CONSULTING	Polar Energy (Netherton) Ltd	**Netherton Wind Turbine**	Viewpoint 4: Brechin - Pittendreich Road	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-8c		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C014a

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 4: Brechin - Pittendreich Road	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-8d		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C014a



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

atmos CONSULTING

Figure 5-9a
Viewpoint 5 - A90 northbound Finavon

Viewpoint Data	
Grid Reference	E349635, N757468
Elevation	56m AOD
Wireframe/Photograph	
Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens
Proposed Turbine Information (Netherton only)	
Hub Height	40m
Blade Tip Height	67m
Predicted Wireframe Turbine Visibility (Netherton only)	
Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	6,529m

0km 3km

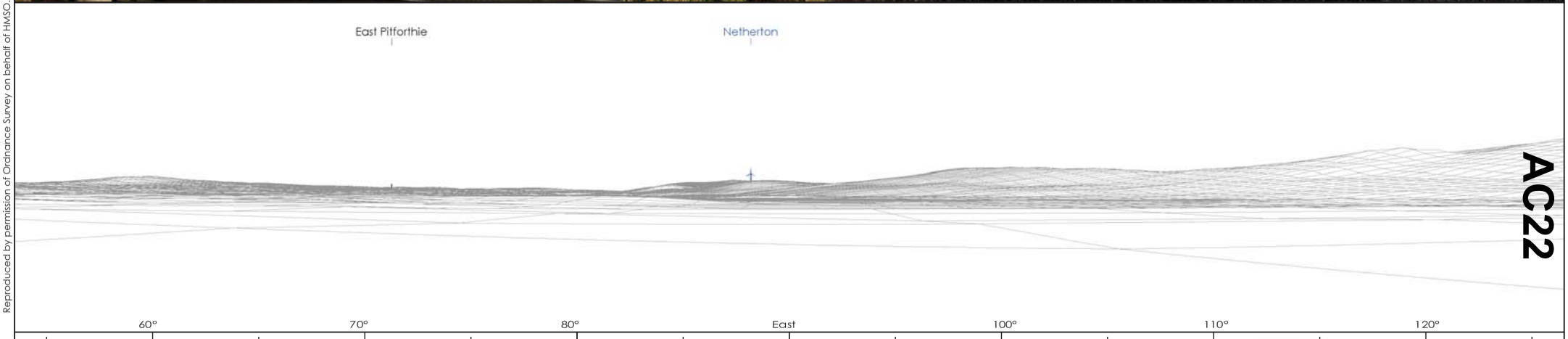
Scale 1:50,000@ A3

Wide Angle Photo of Existing View | Included Angle 110° | Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

Drawn by	JM	TI01c
Checked by	TP	10/2/2014
Approved by	NT	4611_PM_C015b

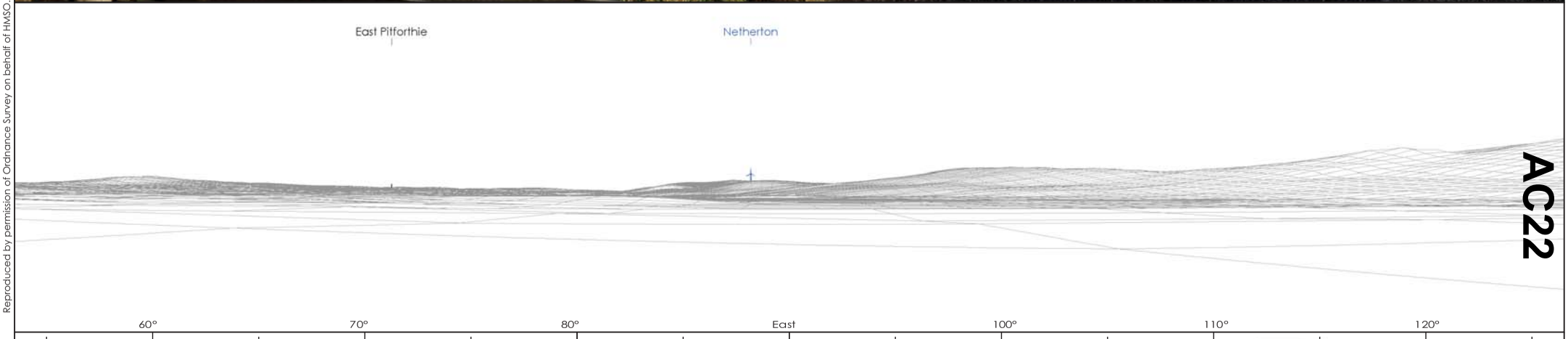
Existing View



AC22

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 5: A90 northbound Finavon	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-9b		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C015b

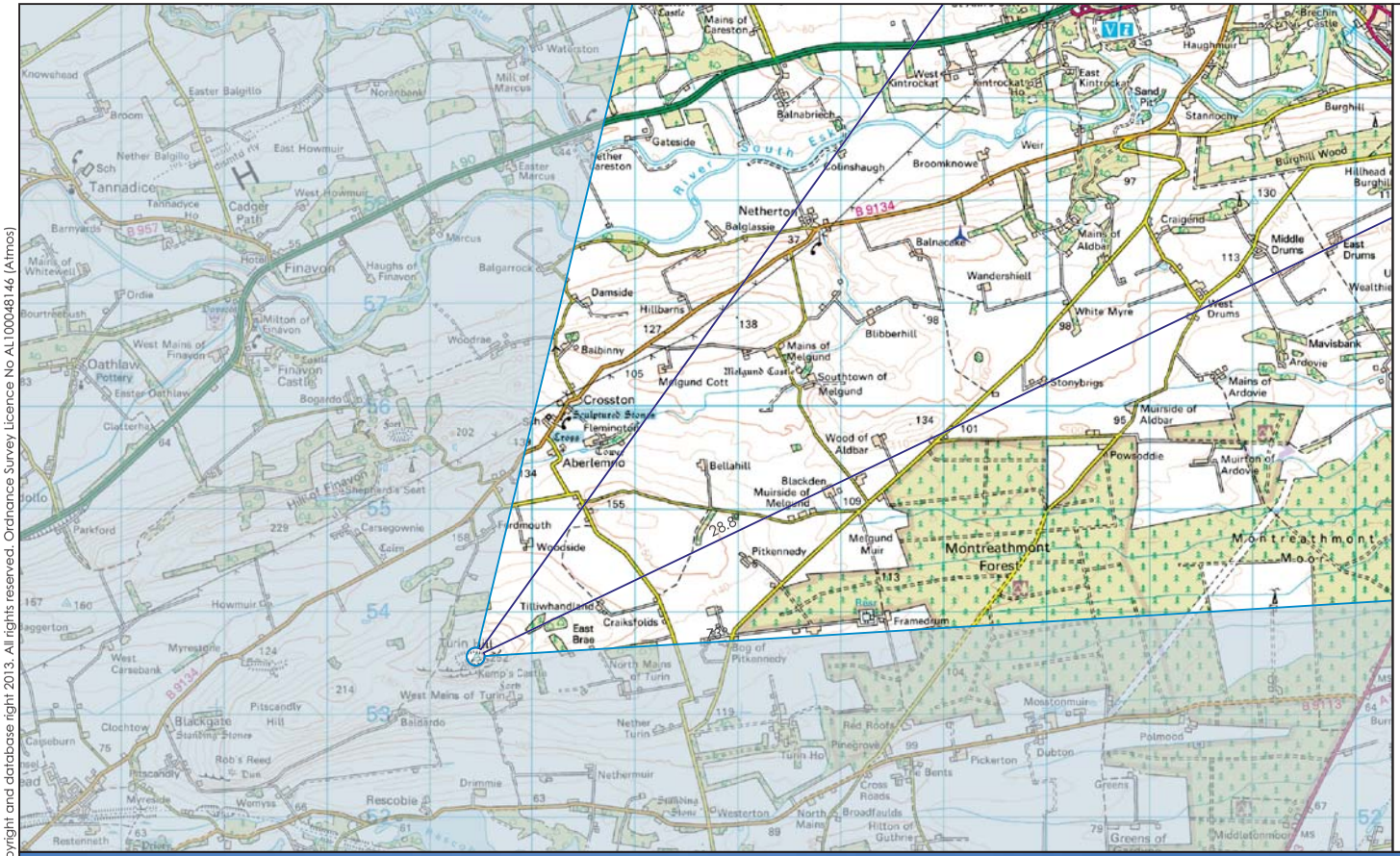
Predicted View



AC22

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 5: A90 northbound Finavon	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-9c		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C015b

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 5: A90 northbound Finavon	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-9d		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C015b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

atmos CONSULTING

Figure 5-10a
Viewpoint 6 - Turin Hill

Viewpoint Data	
Grid Reference	E351468, N753547
Elevation	248m AOD
Wireframe/Photograph	
Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens
Proposed Turbine Information (Netherton only)	
Hub Height	40m
Blade Tip Height	67m
Predicted Wireframe Turbine Visibility (Netherton only)	
Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	6,252m

0km 3km

Scale 1:50,000@ A3

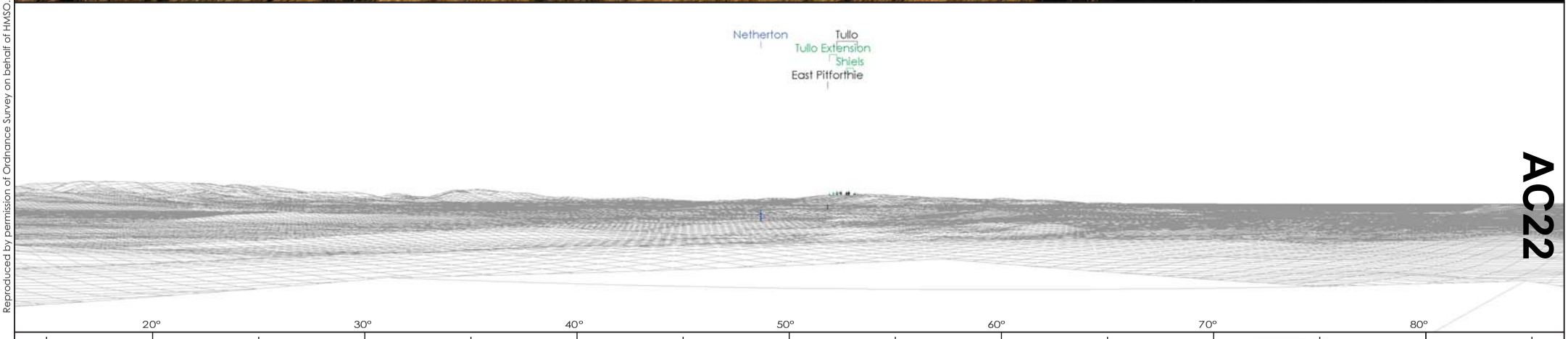
Wide Angle Photo of Existing View Included Angle 110° Approximate Viewing Distance 210mm

AC22

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

Drawn by	JM
Checked by	TP
Approved by	NT
	TI01c
	10/2/2014
	4611_PM_C016b

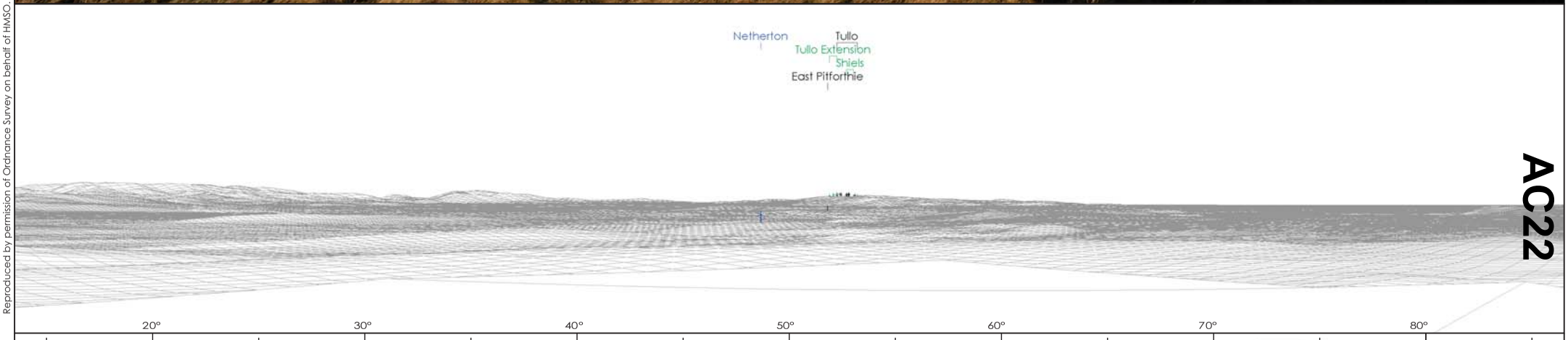
Existing View



AC22

atmos CONSULTING	Polar Energy (Netherton) Ltd	**Netherton Wind Turbine**	Viewpoint 6: Turin Hill	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-10b		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C016b

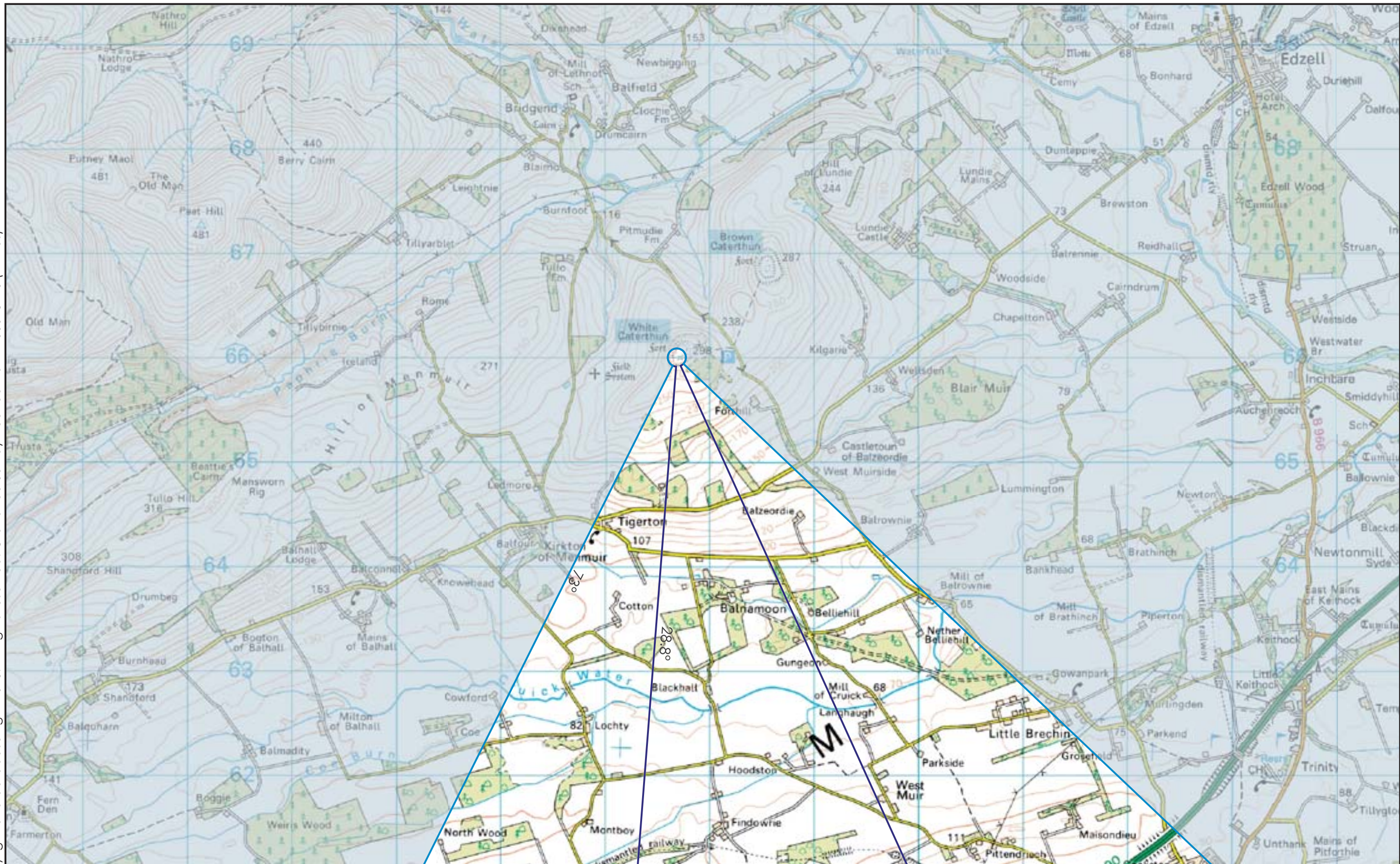
Predicted View



AC22

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 6: Turin Hill	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-10c		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C016b

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 6: Turin Hill	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-10d		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C016b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

atmos CONSULTING

Figure 5-11a
Viewpoint 7 - White Caterthun

Viewpoint Data	
Grid Reference	E354691, N765981
Elevation	290m AOD
Wireframe/Photograph	
Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens
Proposed Turbine Information (Netherton only)	
Hub Height	40m
Blade Tip Height	67m
Predicted Wireframe Turbine Visibility (Netherton only)	
Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	8,432m

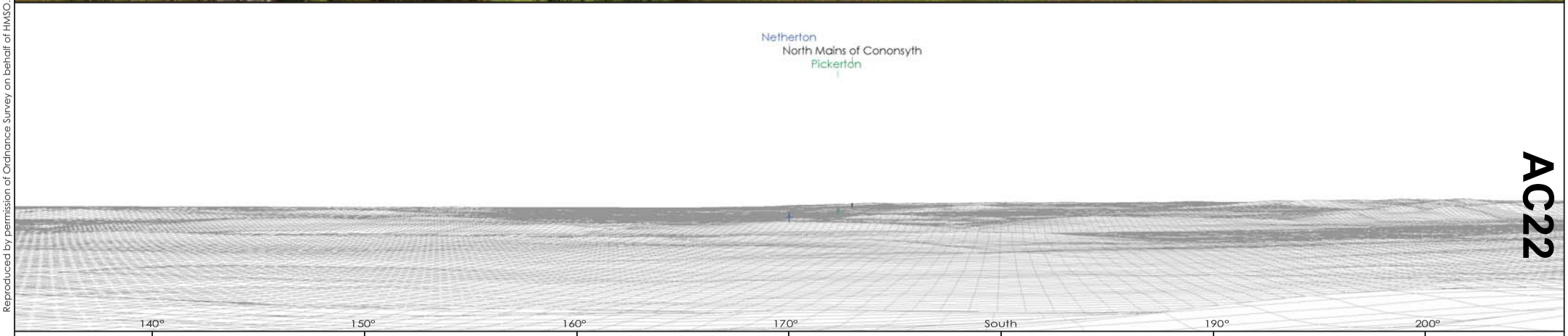
0km 3km
Scale 1:50,000@ A3

▼ Wide Angle Photo of Existing View | Included Angle 110° | Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

Drawn by JM | TI01c
Checked by TP | 10/2/2014
Approved by NT | 4611_PM_C017b

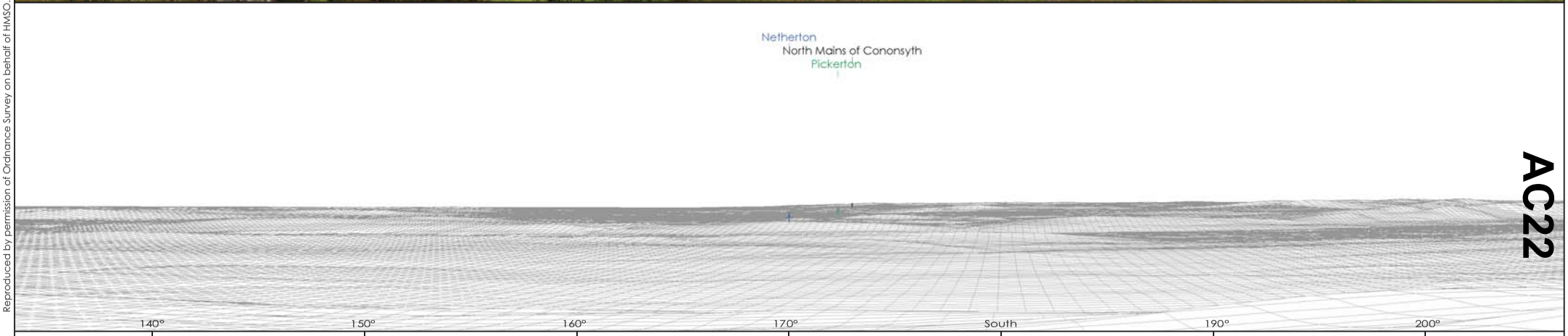
Existing View



AC22

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 7: White Caterthun	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-11b		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C017b

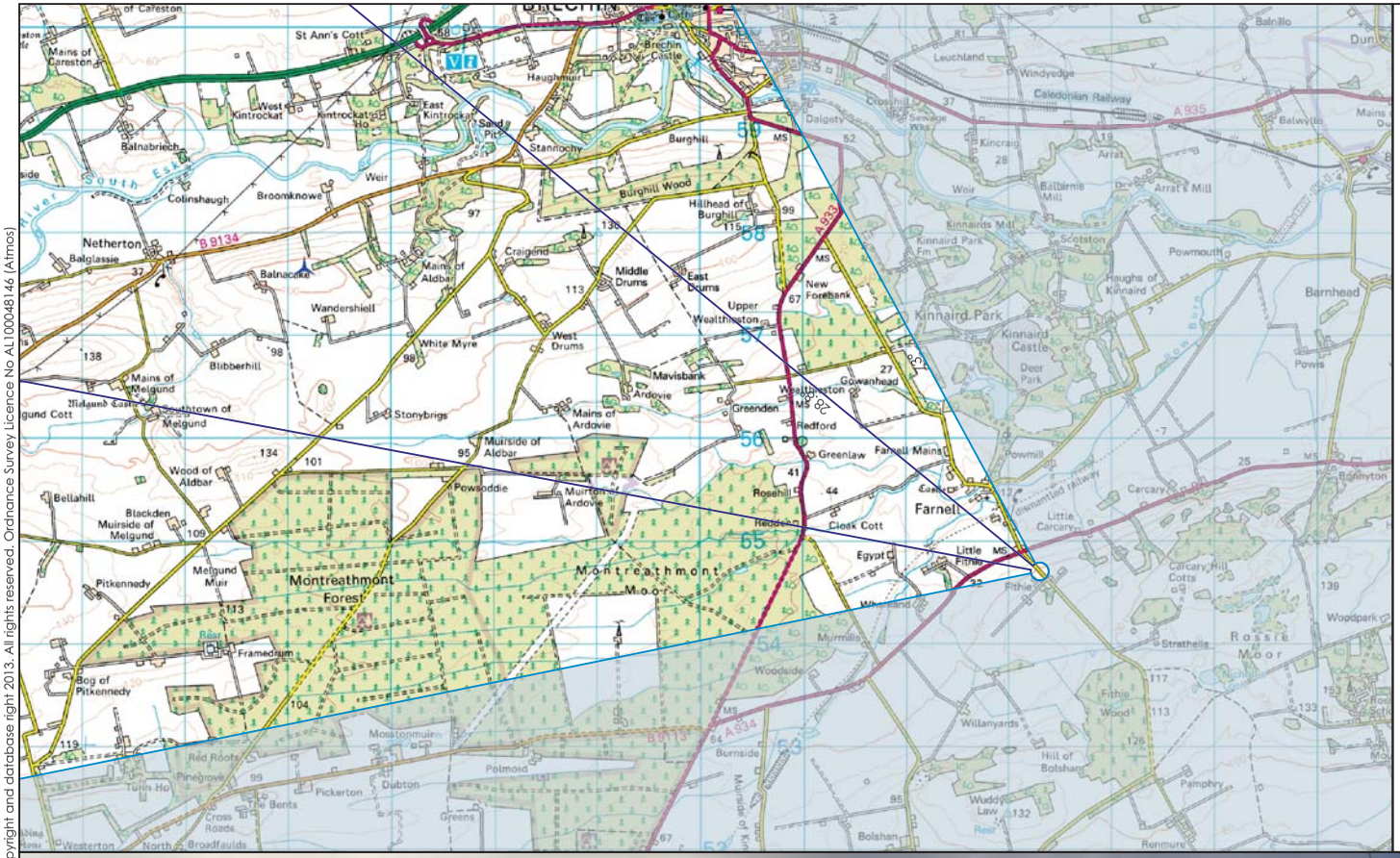
Predicted View



AC22

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 7: White Caterthun	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-11c		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C017b

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 7: White Caterthun	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-11d		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C017b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

atmos CONSULTING

Figure 5-12a
Viewpoint 8 - Minor Road, Fithie / Rossie Moor

Viewpoint Data	
Grid Reference	E363255, N754698
Elevation	52m AOD
Wireframe/Photograph	
Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens
Proposed Turbine Information (Netherton only)	
Hub Height	40m
Blade Tip Height	67m
Predicted Wireframe Turbine Visibility (Netherton only)	
Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	7,694m

0km 3km

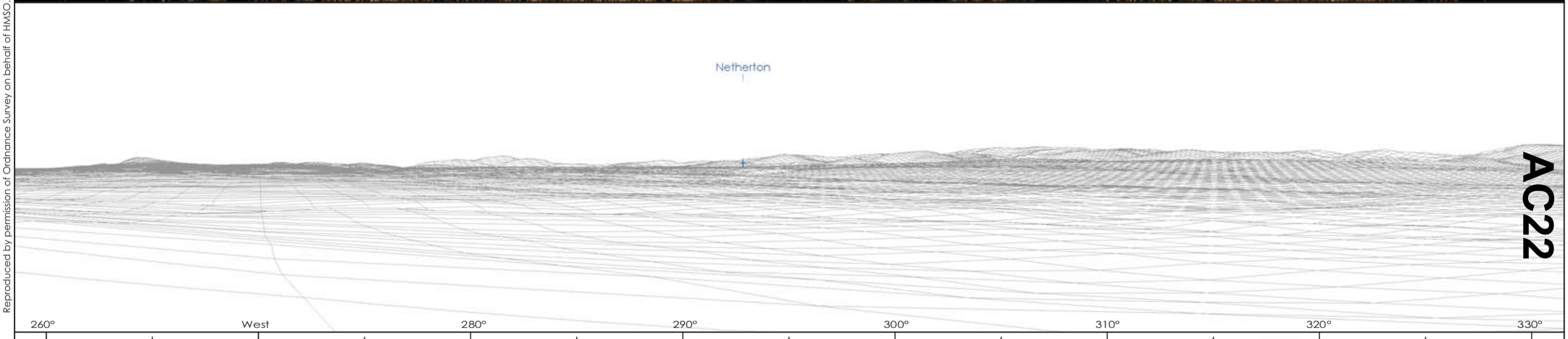
Scale 1:50,000@ A3

Wide Angle Photo of Existing View Included Angle 110° Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

Drawn by	JM	TI01c
Checked by	TP	10/2/2014
Approved by	NT	4611_PM_C018b

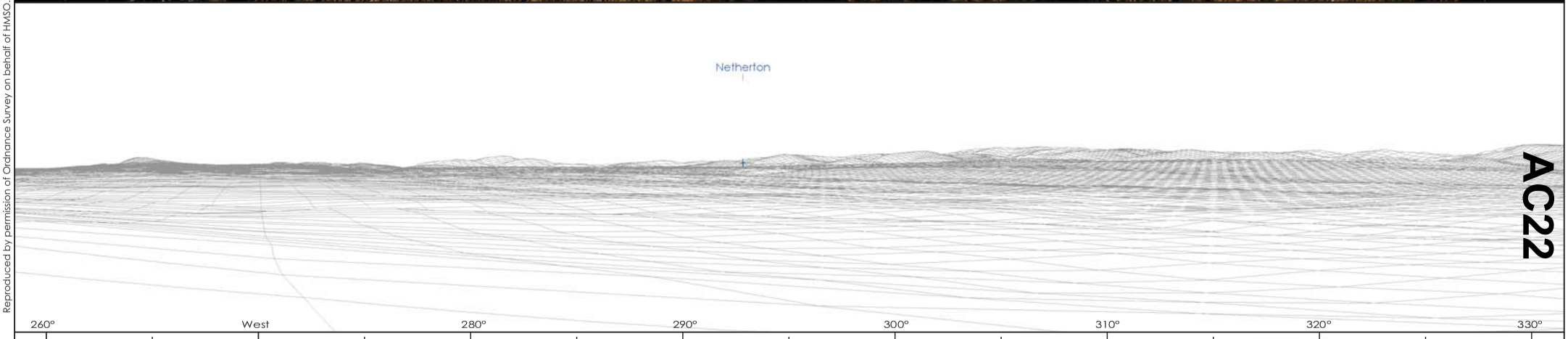
Existing View



AC22

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 8: Minor Road, Fithie / Rossie Moor	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-12b		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C018b

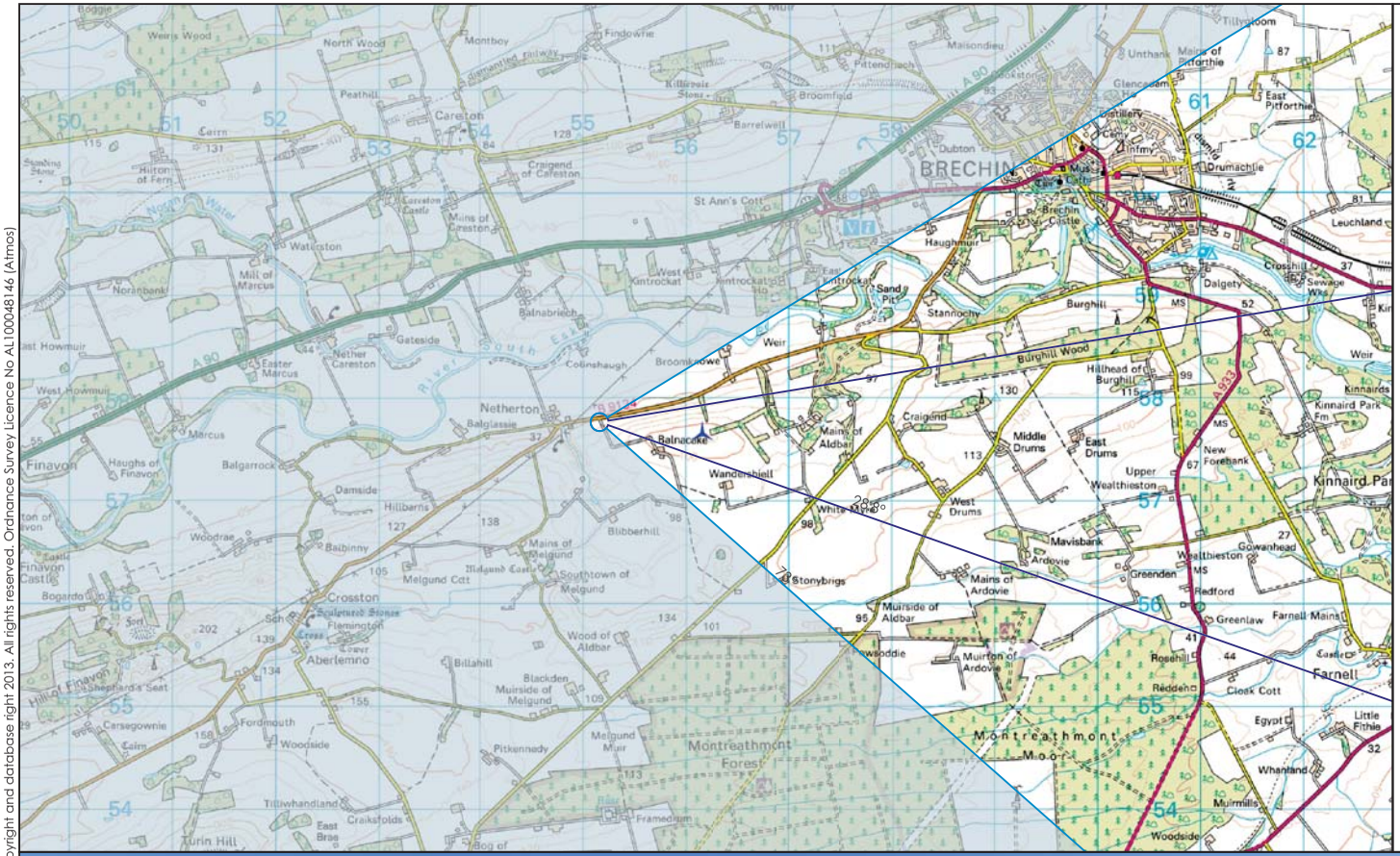
Existing View



AC22

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 8: Minor Road, Fithie / Rossie Moor	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-12c		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C018b

atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 8: Minor Road, Fithie / Rossie Moor	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-12d		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C018b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

atmos CONSULTING

Figure 5-13a
Viewpoint 9 - B9134 near Netherton

Viewpoint Data

Grid Reference	E355145, N757776
Elevation	54m AOD

Wireframe/Photograph

Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens

Proposed Turbine Information (Netherton only)

Hub Height	40m
Blade Tip Height	67m

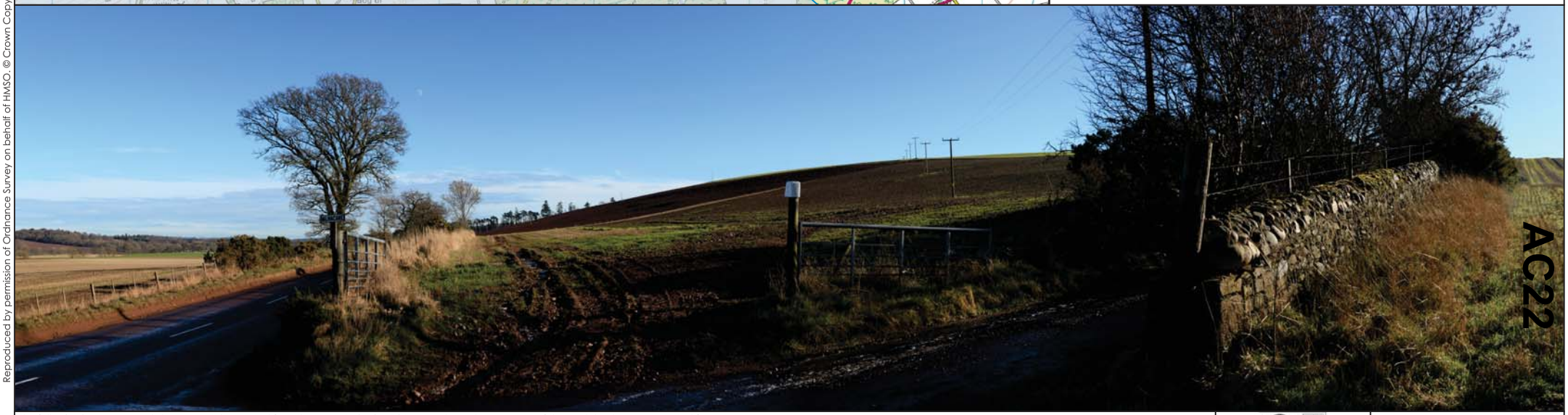
Predicted Wireframe Turbine Visibility (Netherton only)

Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	1,020m

0km 3km

Scale 1:50,000@ A3

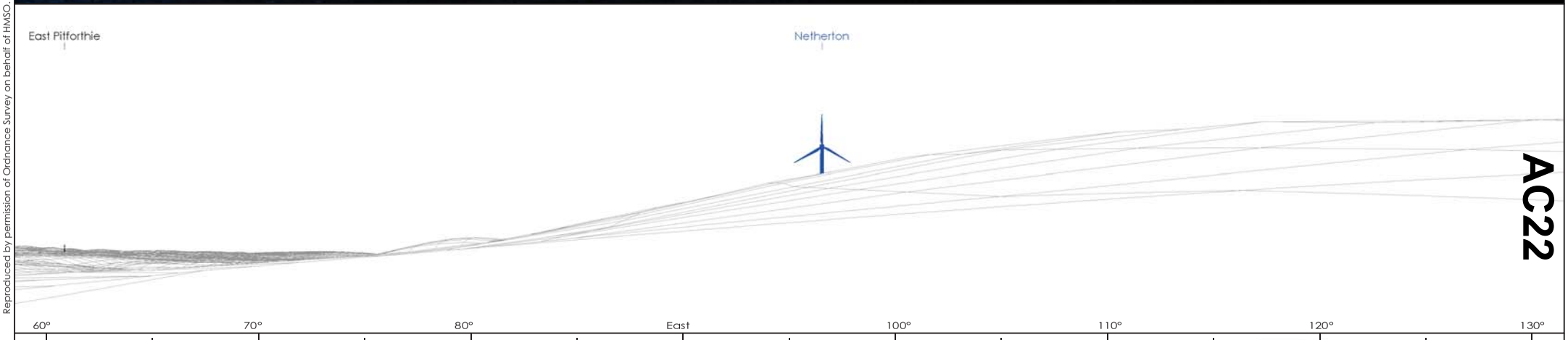
Wide Angle Photo of Existing View Included Angle 110° Approximate Viewing Distance 210mm



The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

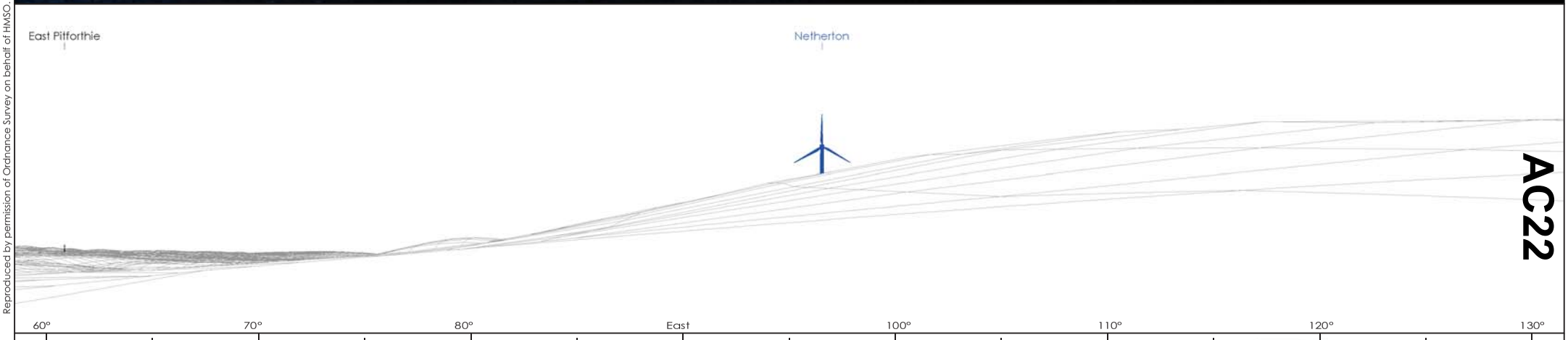
Drawn by	JM
Checked by	TP
Approved by	NT
	Tl01c
	10/2/2014
	4611_PM_C019b

Existing View

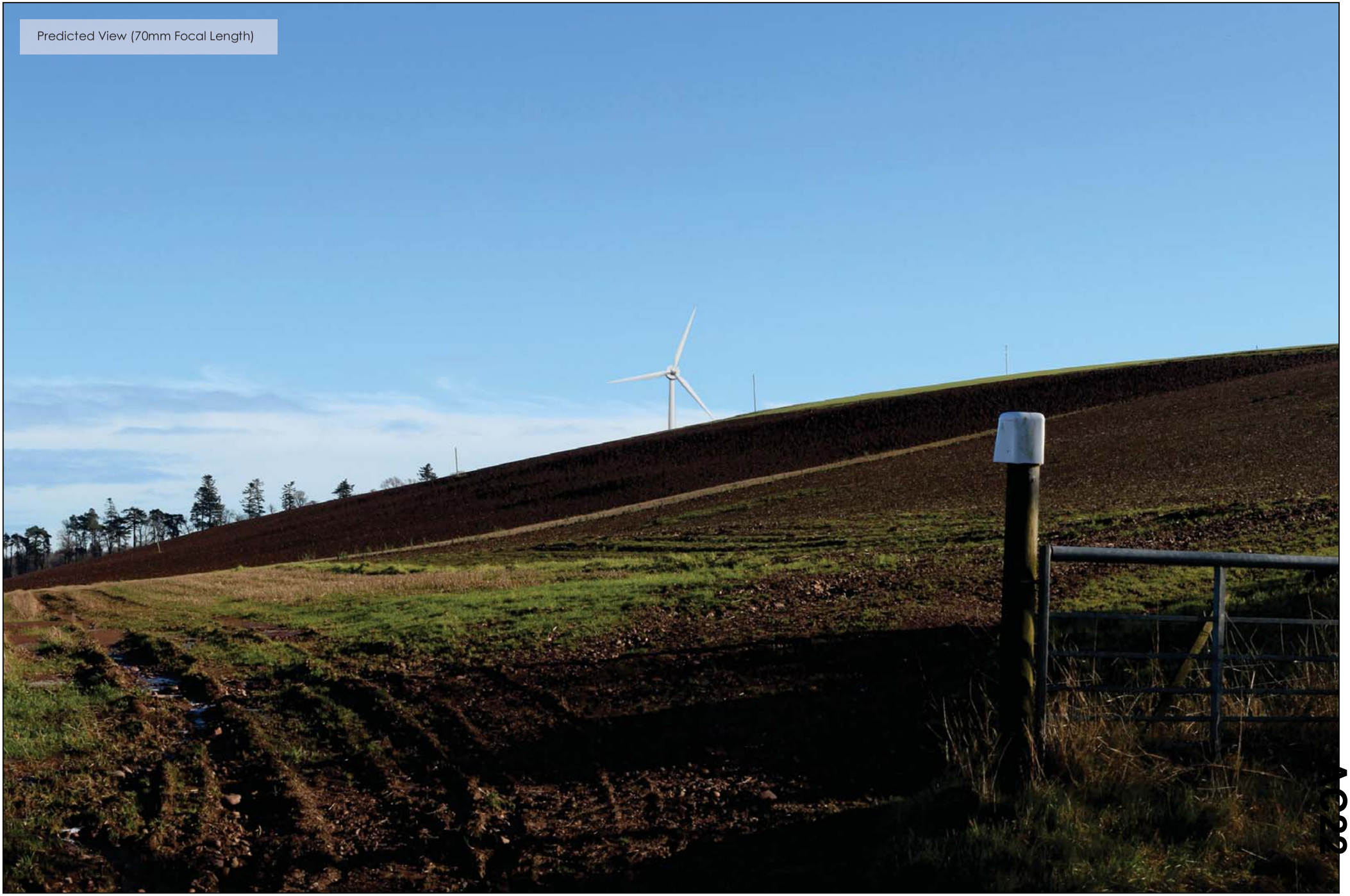


atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 9: B9134 near Netherton	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-13b		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C019b

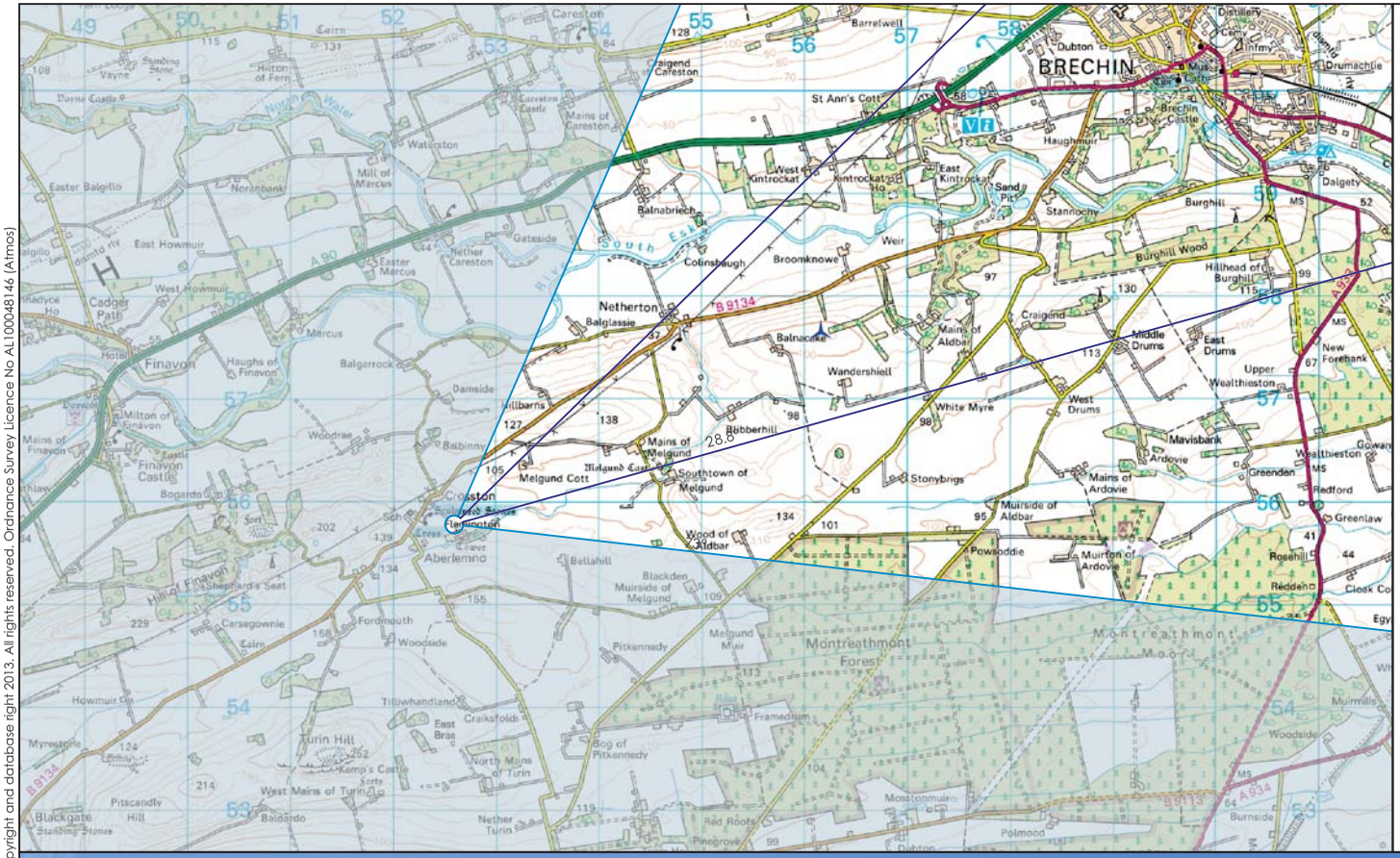
Predicted View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 9: B9134 near Netherton	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-13c		Drawn by JM Checked by TP Approved by NT Tl01c 10/2/2014 4611_PM_C019b



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 9: B9134 near Netherton	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-13d		Drawn by JM Checked by TP Approved by NT T101c 10/2/2014 4611_PM_C019b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

atmos CONSULTING

Figure 5-14a
Viewpoint 10 - Flemington Tower Aberlemno

Viewpoint Data	
Grid Reference	E352593, N755739
Elevation	122m AOD
Wireframe/Photograph	
Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens
Proposed Turbine Information (Netherton only)	
Hub Height	40m
Blade Tip Height	67m
Predicted Wireframe Turbine Visibility (Netherton only)	
Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	4,061m

0km 3km

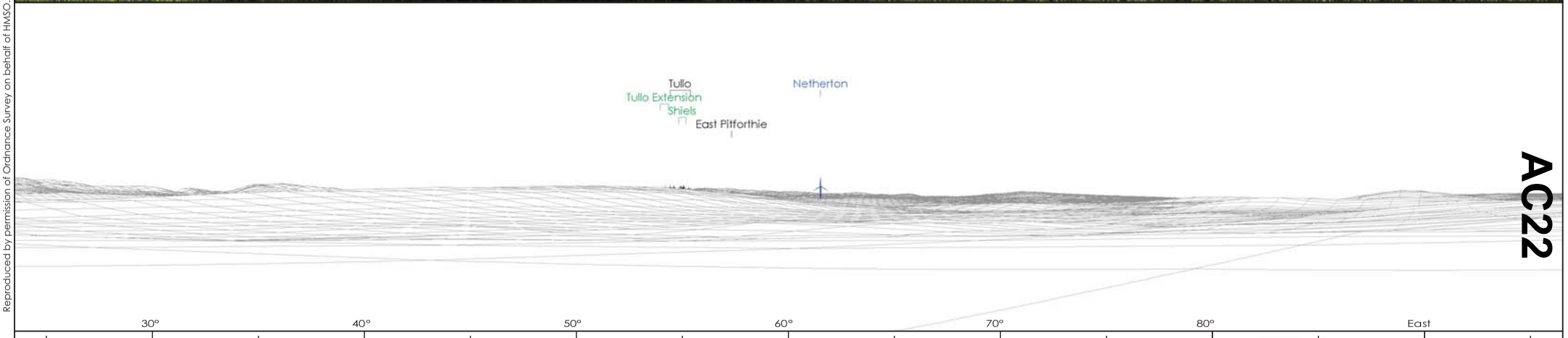
Scale 1:50,000@ A3

▼ Wide Angle Photo of Existing View Included Angle 110° Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

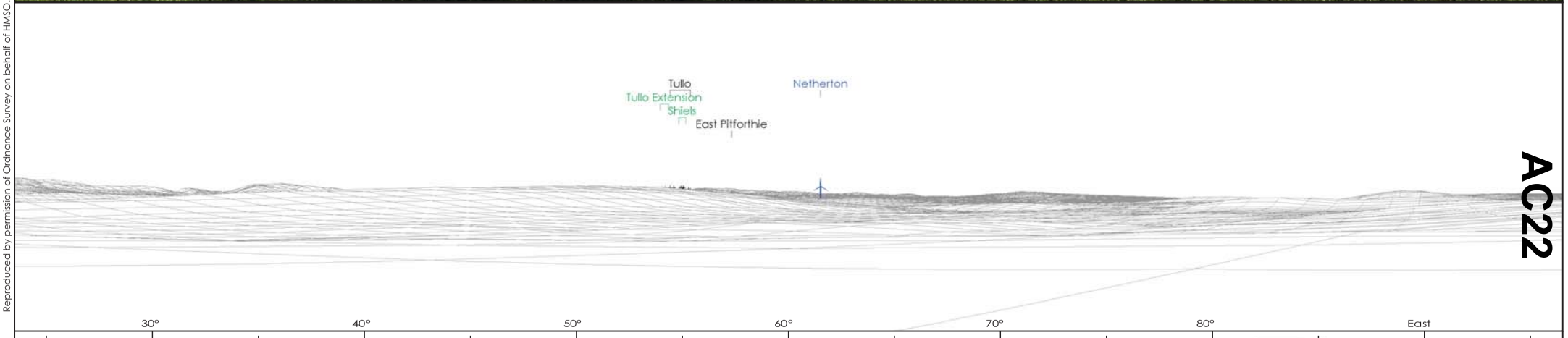
Drawn by	JM	TI01c
Checked by	TP	10/2/2014
Approved by	NT	4611_PM_C020b

Existing View



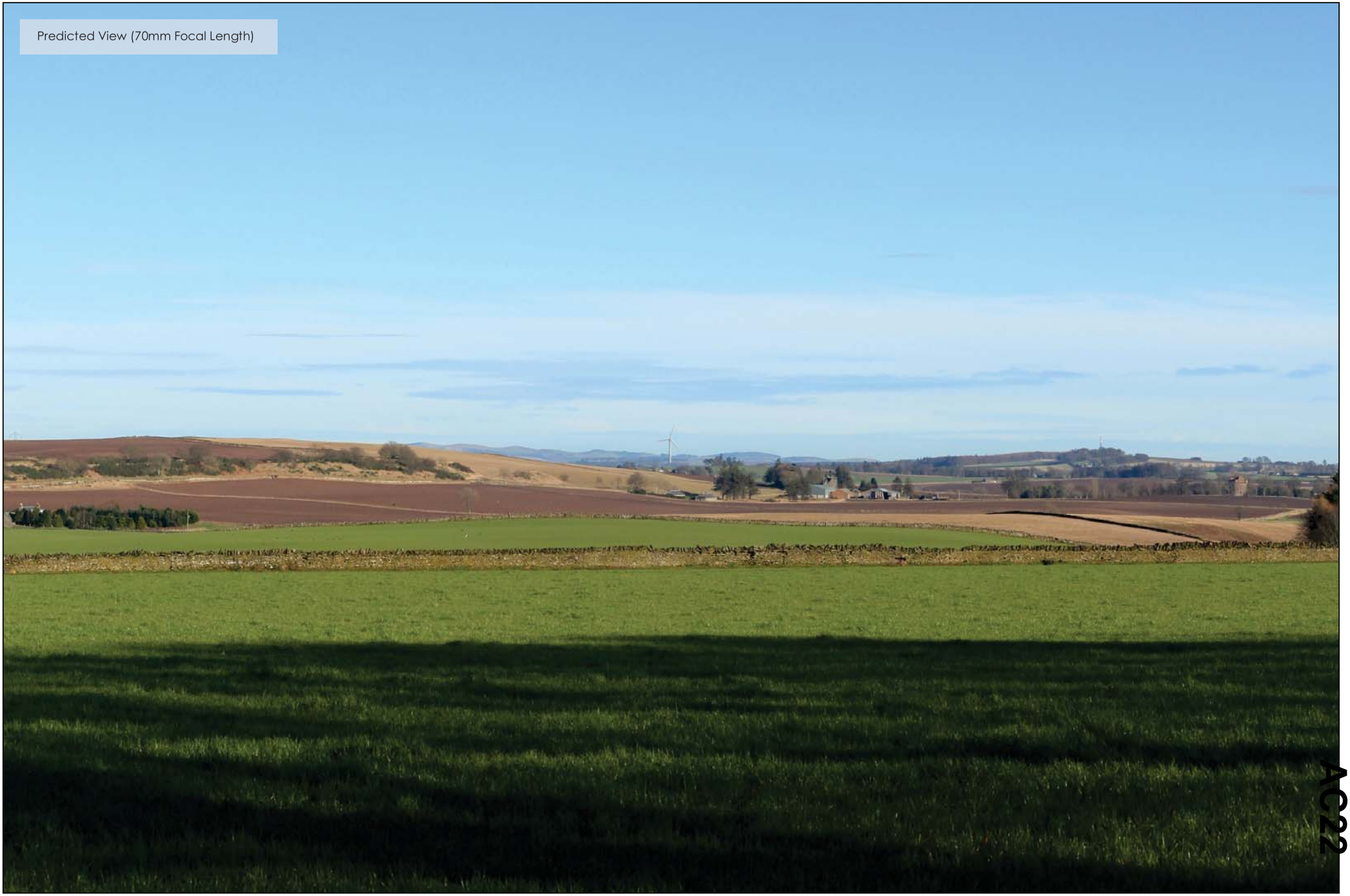
atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 10: Flemington Tower Aberlemno	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-14b		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C020b

Predicted View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 10: Flemington Tower Aberlemno	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-14c		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C020b

Predicted View (70mm Focal Length)



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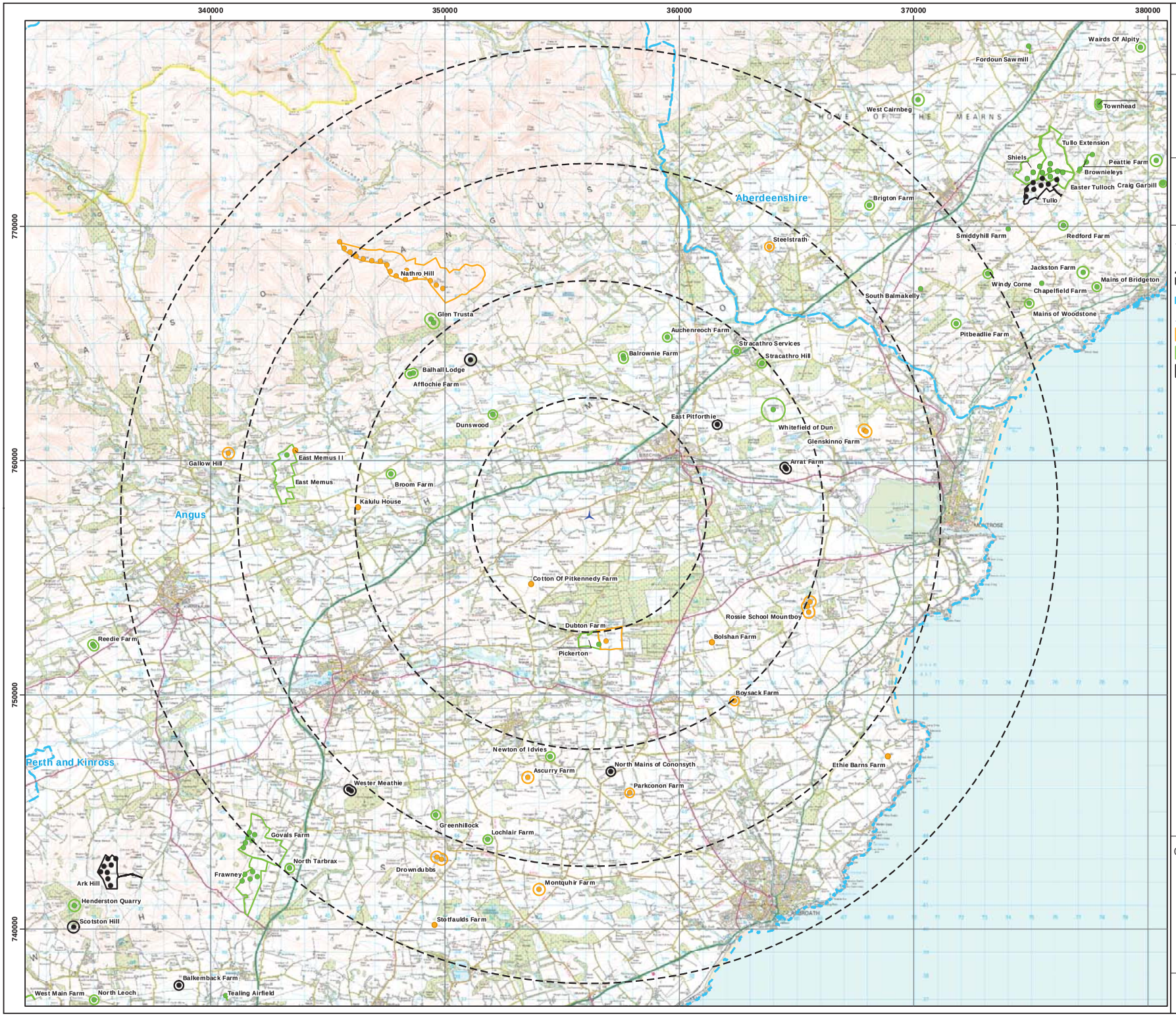
atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 10: Flemington Tower Aberlemno	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-14d		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C020b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-15
Cumulative Wind Farms

Key

- Turbine location
- 5km turbine radii to 20km
- Council boundary

Cumulative Wind Farms (above 40m)

- Wind farm in planning
- Approved wind farm
- Operational wind farm
- Turbine in planning above 40m tip
- Approved turbine above 40m tip
- Operational turbine above 40m tip

Cumulative dataset statuses correct as of 24th January 2014

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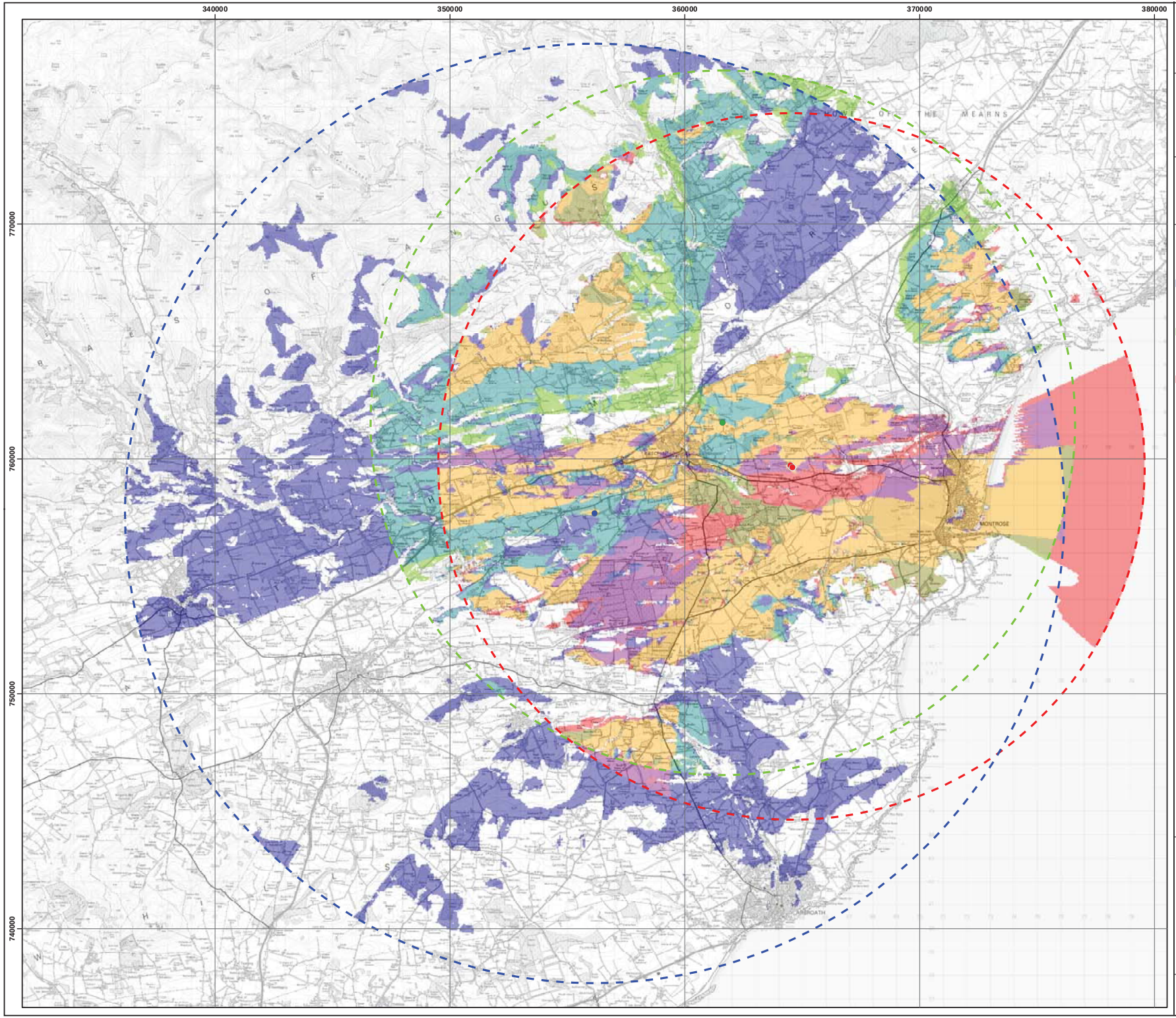
0 2.5 5 10
Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/LS/007a

Drawn by: AA Checked by: TH Approved by: NT



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-16a
Cumulative ZTV - Operational - Netherton with East Pitforthie and Arrat Farm

Key

- Netherton turbine (67m)
- Netherton 20km turbine buffer
- East Pitforthie turbine (47m)
- East Pitforthie 15km turbine buffer
- Arrat Farm turbine (46.5m)
- Arrat Farm 15km turbine buffer

Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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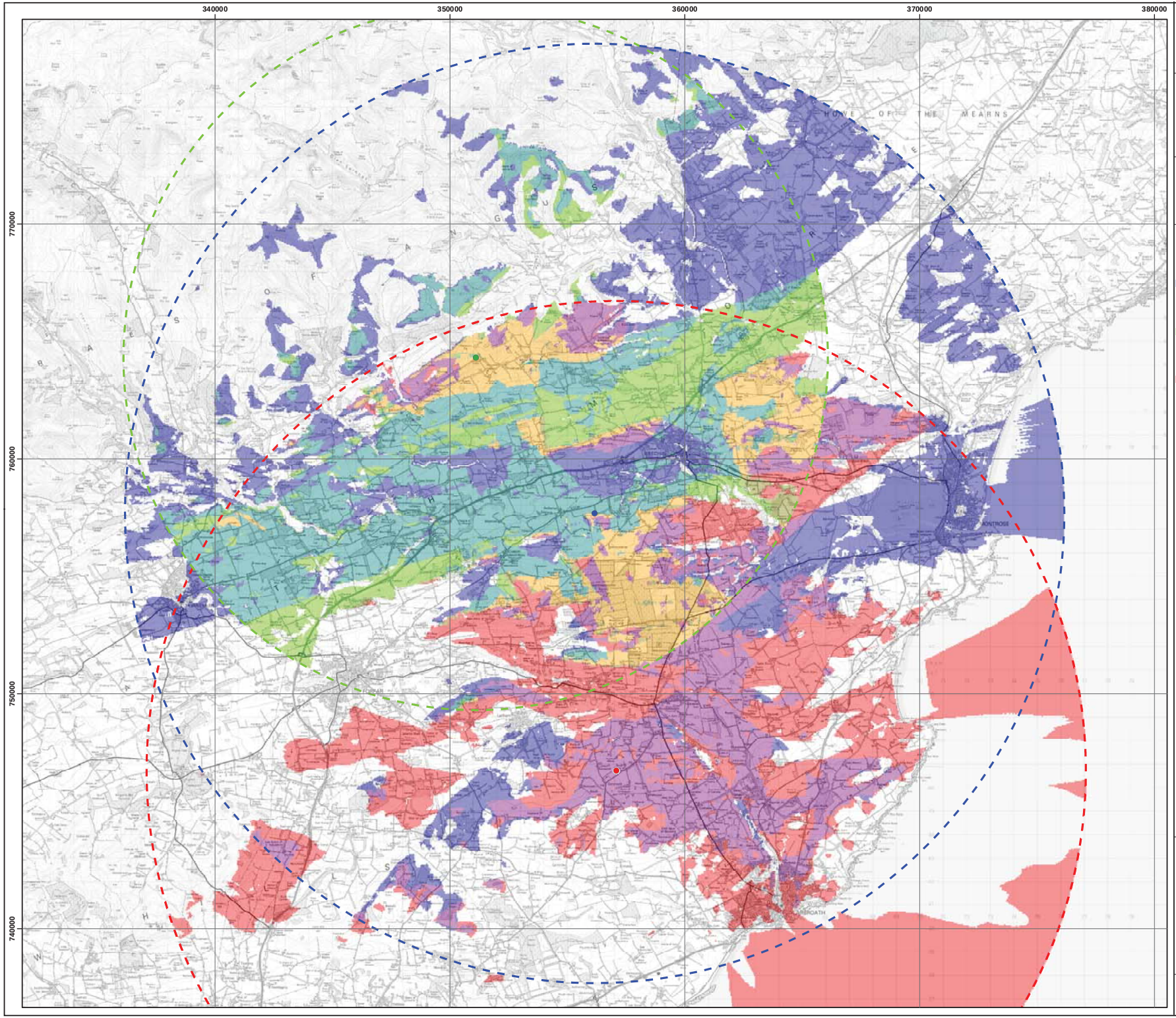
AC22

0 2.5 5 10
Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/ZV/010a
Drawn by: AA Checked by: TH Approved by: NT



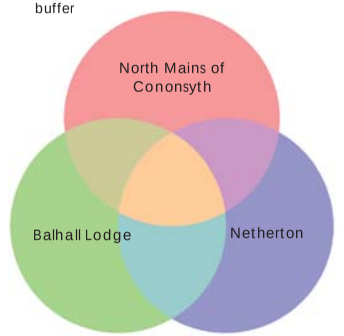
Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-16b
Cumulative ZTV - Operational - Netherton with Balhall Lodge and North Mains of Cononsyth

Key

- Netherton turbine (67m)
- Netherton 20km turbine buffer
- Balhall Lodge turbine (48m)
- Balhall Lodge 15km turbine buffer
- North Mains of Cononsyth turbine (66.7m)
- North Mains of Cononsyth 20km turbine buffer



Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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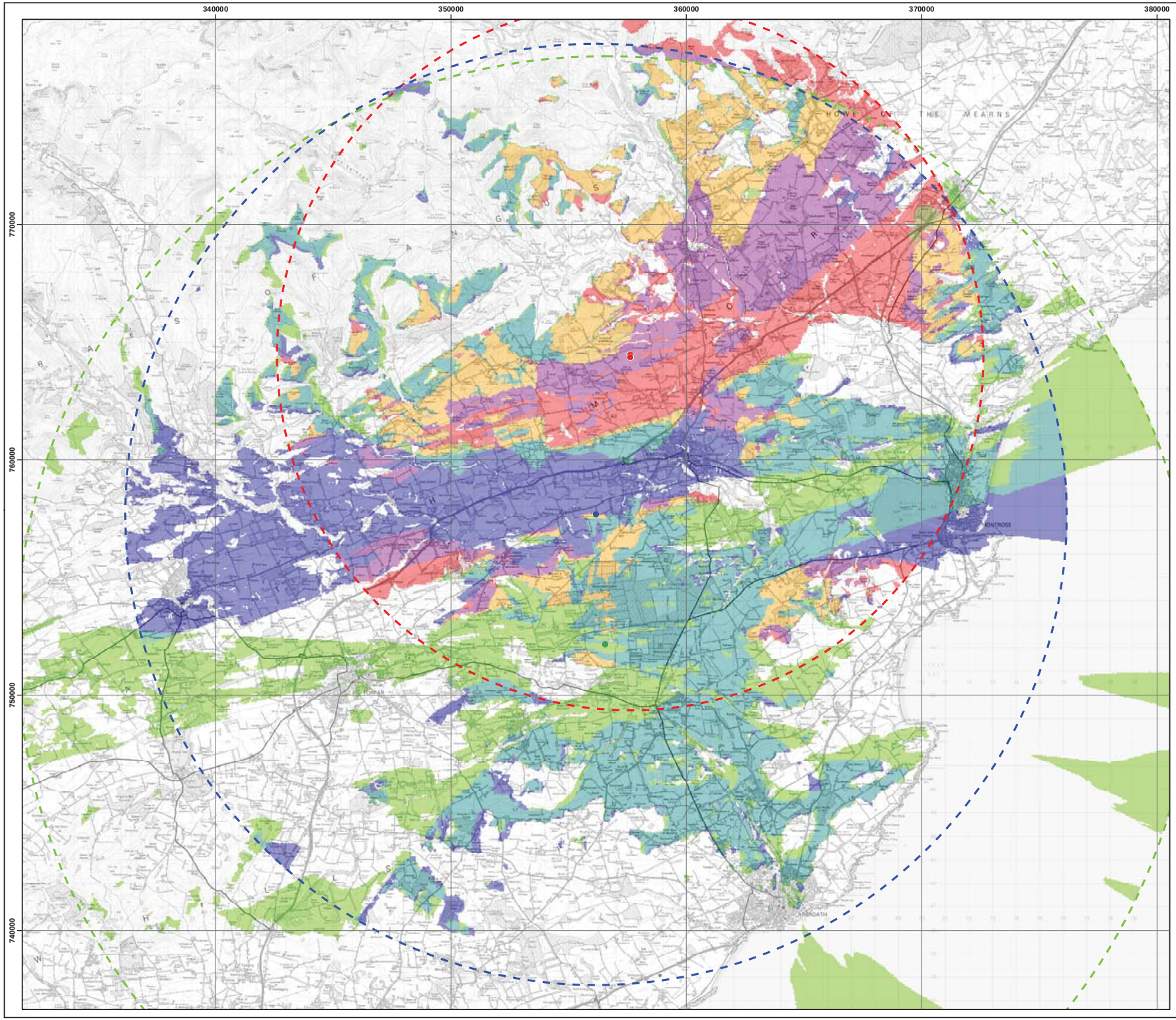
0 2.5 5 10
Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/ZV/010a
Drawn by: AA Checked by: TH Approved by: NT



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-17a
Cumulative ZTV - Approved - Netherton with Pickerton and Balrownie Farm

Key

- Netherton turbine (67m)
- Netherton 20km turbine buffer
- Pickerton turbine (77m)
- Pickerton 25km turbine buffer
- Balrownie Farm turbine (46.5m)
- Balrownie Farm 15km turbine buffer

Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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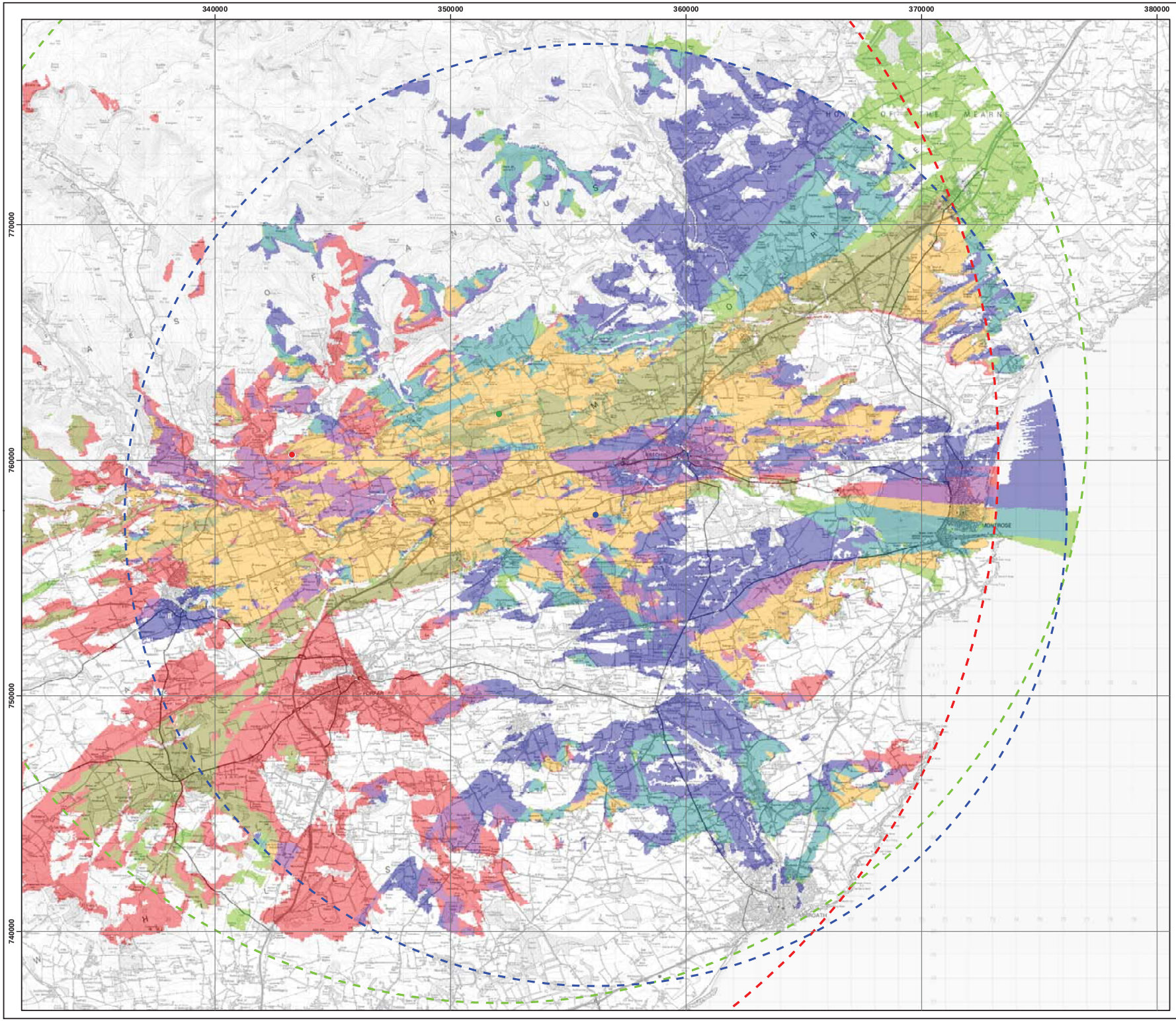
0 2.5 5 10
Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/ZV/010a
Drawn by: AA Checked by: TH Approved by: NT



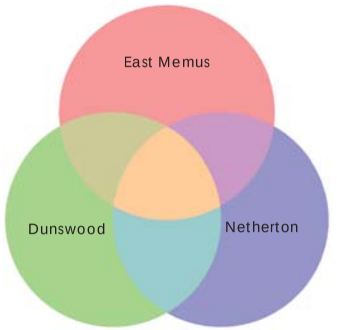
Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-17b
Cumulative ZTV - Approved - Netherton with Dunswood and East Memus

Key

- Netherton turbine (67m)
- Netherton 20km turbine buffer
- Dunswood turbine (77m)
- Dunswood 25km turbine buffer
- East Memus turbine (86.5m)
- East Memus 30km turbine buffer



Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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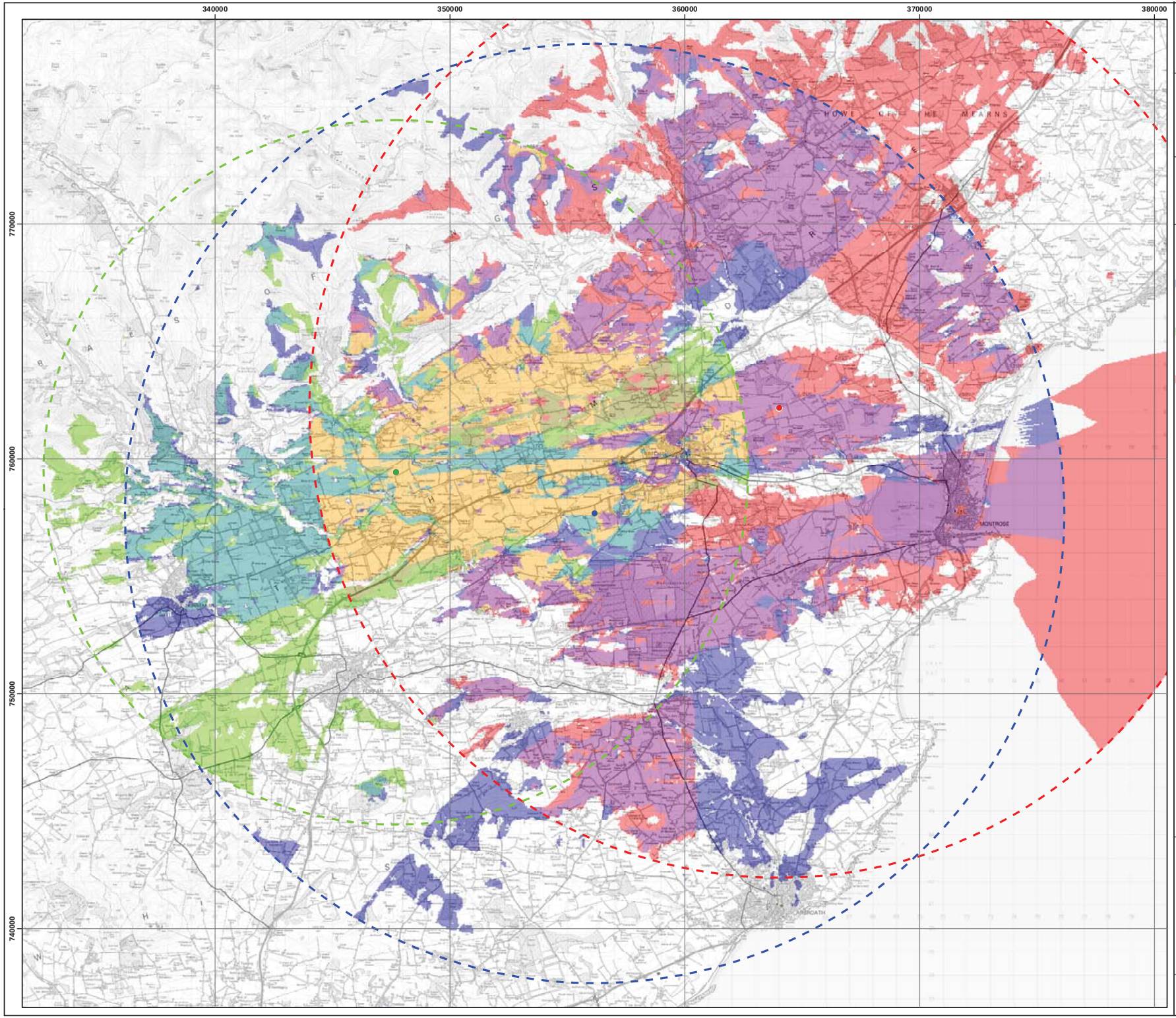
0 2.5 5 10
Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/ZV/010a
Drawn by: AA Checked by: TH Approved by: NT



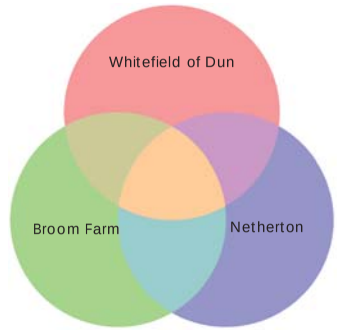
Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-17c
Cumulative ZTV - Approved - Netherton with Broom Farm and Whitefield of Dun

Key

- Netherton turbine (67m)
- Netherton 20km turbine buffer
- Broom Farm turbine (49.5m)
- Broom Farm 15km turbine buffer
- Whitefield of Dun turbine (67m)
- Whitefield of Dun 20km turbine buffer



Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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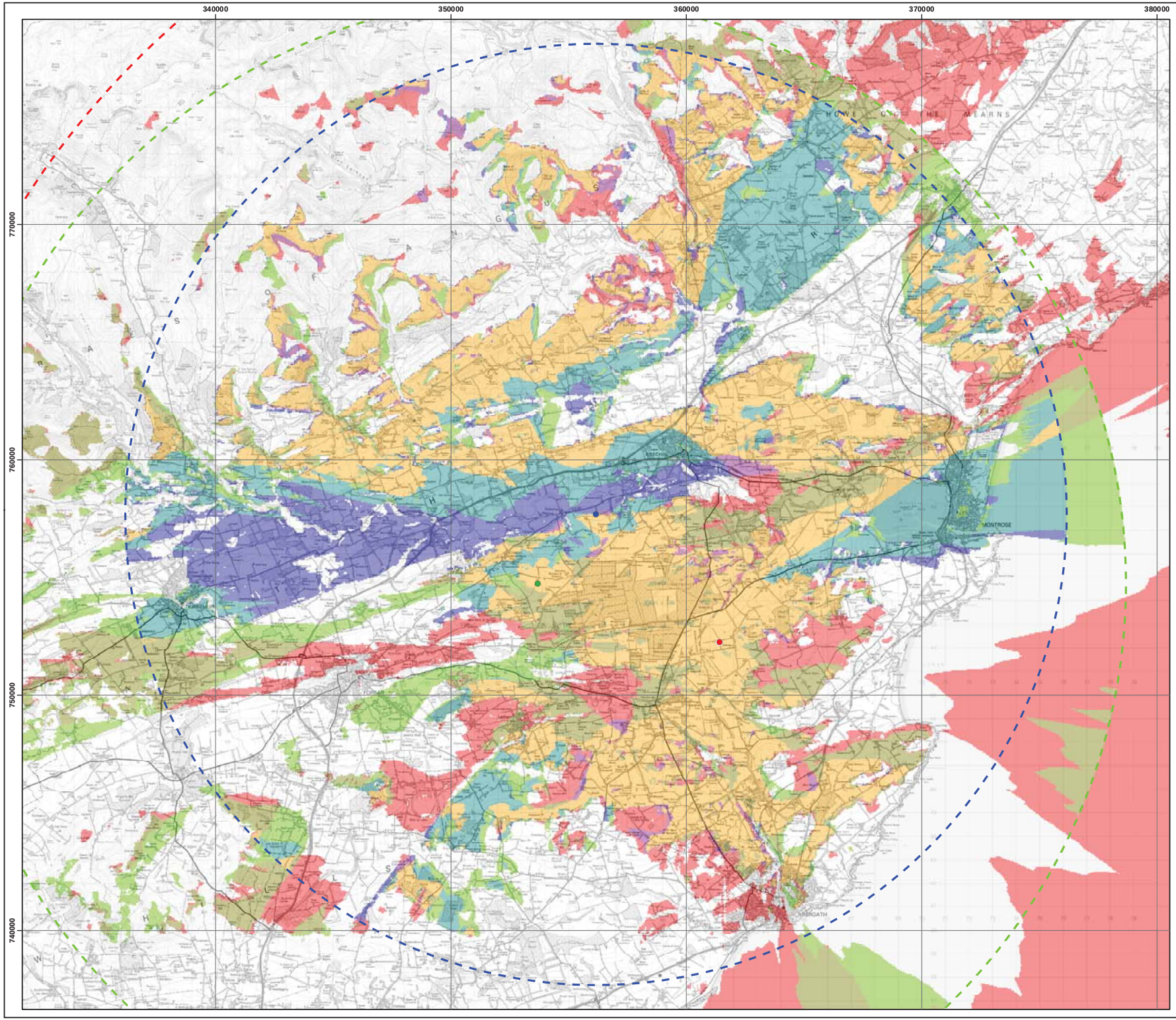
0 2.5 5 Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/ZV/010a
Drawn by: AA Checked by: TH Approved by: NT



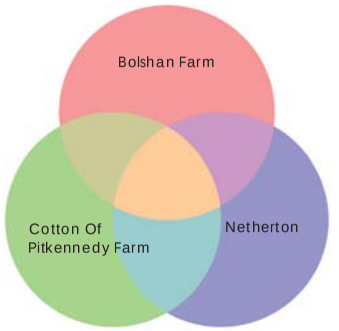
Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-18a
Cumulative ZTV - In planning - Netherton with Cotton Of Pitkennedy Farm and Bolshan Farm

Key

- Netherton turbine (67m)
- Netherton 20km turbine buffer
- Cotton Of Pitkennedy Farm turbine (74m)
- Cotton Of Pitkennedy Farm 25km turbine buffer
- Bolshan Farm turbine (102m)
- Bolshan Farm 35km turbine buffer



Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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0 2.5 5 10
Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/ZV/010a
Drawn by: AA Checked by: TH Approved by: NT

6 Ecology and Ornithology

6.1 Introduction

Although a small scale, single turbine development, there is still potential to affect the ecological and ornithological receptors on site with potential impacts occurring during the construction, operational and decommissioning phases of the project.

The single turbine and associated infrastructure (upgraded track, new track and crane hardstanding) and associated planning application buffer is hereafter referred to as the 'Site' (Figure 1-1). In this section independent advice on the potential effects of the development on the nature conservation interest of the Site and its immediate environs is presented with an assessment of potential constraints to the development posed by the ecology and ornithology and its surroundings.

6.2 Methodology and Approach

6.2.1 Information Sources

Several sources of information were used to inform this chapter. Information on statutory sites was obtained from the website of the statutory agency SNH via the 'Site Link Portal' (http://www.snh.org.uk/snhi/). Search areas were 10km for sites designated for ecological features, and 20km for sites designated for ornithological features. A search was also conducted for (internationally to nationally) protected species records within the NO55 10km Grid Square on the National Biodiversity Network (NBN) Gateway website (http://www.searchnbn.net/) to further inform the impact assessment.

Aerial photography of the Site was examined using photography available in the public domain on the www.bingmaps.co.uk and www.maps.google.co.uk web pages.

The following sources of information were used:

- Results of internet searches as detailed above;
- UK Biodiversity Action Plan (UK BAP); and
- Tayside Local Biodiversity Action Plan (TLBAP).

The proposed Site is covered by the Tayside Local Biodiversity Action Plan (NES LBAP) covering both the Angus and Perth & Kinross Council areas. Relevant aspects of the Tayside LBAP include Species Action Plans (HAPs) for 'barn owl (Tyto alba), red squirrel (Sciurus vulgaris), otter (Lutra lutra), Atlantic salmon (Salmo salar) and bat (f. Vespertilionidae) species'.

A desktop search was also undertaken for publicly available information in relation to existing or proposed wind farms within 10km of the proposed Site. The Environmental Statements (ES) or Non-technical Summaries (NTS) referenced included:

- Dubton Farm (5.7 from the Site);
- Dunswood (5.7km from the Site);
- Balrownie (6.7km from the Site);
- Auchenreoch Farm (8.2km from the Site)
- Kalulu House (8.4km from the Site) and;
- Afflochie Farm (9.4km from the Site).

6.3 Results

6.3.1 Site Description

The proposed development site is located on part of Balnacake farm on land which is currently used for agriculture. The site lies approximately 6km southwest of Brechin and approximately 12km northeast of Forfar. Figure 1-2 shows the site location.

There are no properties located within 400m of the proposed turbine location. The closest property is the Balnacake residential property approximately 450m southwest of the proposed turbine location. The closest non-residential property is Broomknowe Cottage approximately 560m northeast of the proposed turbine location

6.3.2 Designated sites

There are no statutory or non-statutory designated areas for ecology or ornithology within the boundary of the Site. However, there is one statutory designated site in close proximity of the Site, the River South Esk Special Area of Conservation (SAC). This site, comprising of the South Esk River (and selected tributaries) is approximately 750m from the development Site. The SAC site is internationally designated for aquatic species; Atlantic salmon and Freshwater pearl mussel (*Margaritifera margaritifera*).

Outwith 5km the nearest statutory designated site is Rescobie and Balgavies Lochs Site of Special Scientific Interest (SSSI) located approximately 6km from the Site, designated for habitats features. There are three further sites designated for ecological features located within 10km of the Site boundary, these are Restenneth Moss SSSI (8km), Rossie Moor SSIS (9km) and Dun's Dish SSIS (9km), the latter also having ornithological qualifying features. Further details of all designations are presented below in Table 6-1.

Other than Dun's Dish SSIS, the closest designated site with ornithological qualifying features is the Montrose Basin Special Protection Area (SPA), Ramsar and SSSI 10 km south east of the Site. The site qualifies for designation as an SPA under Article 4.1 of the Birds Directive (2009/147/EC) by supporting non-breeding populations of European importance of Annex I species; Pink-footed Goose (*Anser brachyrhynchus)* and Icelandic Greylag Goose (*anser anser*).

There are two further SPAs within 20km of the Site boundary, these are Cairngorms Massif SPA (15km), designated for breeding Golden eagle (*Aquila chrysaetos*) populations and Loch of Kinnordy SPA (18km), designated for supporting non-breeding Pink-footed Goose and Icelandic Greylag Goose. A further site designated for ornithological features is, Whiting Mess SSIS, located 15km southeast of the Site. It is designated for breeding seabird species and non-breeding wader species and well as invertebrates and habitats. Further details of all designations and qualifying features are presented below in Table 6-1.

Table 6-1: Designated Sites within Study Area

Site details	Feature type	Qualifying features
River South Esk SAC Distance from the Site: <1km	Ecology	Atlantic salmon Freshwater pearl mussel
Montrose Basin SPA, Ramsar, SSSI	Ornithology	Dunlin (*Calidris alpina alpine*) - non-breeding

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Site details	Feature type	Qualifying features
Distance from the Site: 10km	Ecology	Eider (*Somateria mollissima*) - non-breeding Greylag goose - non-breeding Knot (*Calidris canutus*) - non-breeding Pink-footed goose - non-breeding Redshank (*Tringa tetanus*) - non-breeding Wigeon (*Anas Penelope*) - non-breeding Waterfowl assemblage - non-breeding Oystercatcher (*Haematopus ostralegus*) - non-breeding Shelduck (*Tadorna tadorna*) - non-breeding Saltmarsh habitat Transitional saltmarsh habitat Mudflats habitat
Cairngorms Massif SPA Distance from the Site: 15km	Ornithology	Golden eagle -breeding
Loch of Kinnordy SPA, Ramsar, SSIS Distance from the Site: 18km	Ornithology	Greylag goose - non-breeding Pink-footed goose - non-breeding Breeding bird assemblage Open water transition fen habitat Eutrophic loch habitat
Rescobie and Balgavies Lochs SSSI Distance from the Site: 6km	Ecology	Basin fen habitat Transition fen habitat Vascular plant assemblage
Restenneth Moss SSSI Distance from the Site: 8km	Ecology	Basin Fen habitat
Rossie Moor SSIS Distance from the Site: 9km	Ecology	Lowland dry heath habitat Valley Fen habitat Dipteran (fly) assemblage Coleopteran (beetle) assemblage
Dun's Dish SSIS Distance from the Site: 9km	Ornithology Ecology	Breeding bird assemblage Open water transition fen Eutrophic loch
Whiting Mess Distance from the Site: 15km	Ornithology Ecology	Fulmar (*Fulmarus glacialis*) - breeding Kittiwake (*Rissa tridactyla*) - breeding Puffin (*Fratercula arctica*) - breeding Shag (*Phalacrocorax aristotelis*) - breeding Purple sandpiper (*Calidris maritima*) - non-breeding Turnstone (*Arenaria interpres*) - non-breeding Small blue butterfly (*Cupido minimus*) Lowland neutral grassland habitat

6.3.3 Habitats and Vegetation

The turbine is located within an arable field located approximately 450m from an existing farm track and 150m from the B9134. Agricultural drainage and issues are found south of the field with no significant riparian buffer strips present. A small strip of coniferous woodland is present 115m east of the proposed turbine location, and scattered mixed trees can be found on the arable field margin by the B9134.

The Site does not support any areas of habitat identified as being potentially dependent on groundwater and the agricultural nature of the surrounding landscape results in no significant areas of potentially groundwater dependent habitat within 250m of the proposed scheme.

Four areas of ancient woodland (long established woodland of plantation origin) are located within 2km of the Site, but none are present within or immediately adjacent (<1km) to the Site.

6.3.4 Fauna

From NBN data searches, records for a number of internationally and nationally protected or priority species are present within the wider area, but no records are located within the Site. A total of 6 avian species and 3 mammal species were recorded within the search area (10km grid square NO55), these are listed in Table 6-2 below.

Table 6-2: Protected and Priority Species within the Study Area

Avian species	SBL*	UK BAP*	Schedule 1*	Annex 1*
Barn Owl (tyto alba)	x		x	
Barnacle Goose(Branta leucopsis)	x			x
Common Kingfisher (Alcedo atthis)	x		x	x
Osprey (Pandion haliaetus)			x	x
Scottish Crossbill (Loxia scotica)	x	x	x	x
Capercaillie (Tetrao urogallus)	x	x	x	x
Non-avian species	**SBL**	**UK BAP**	**SAP***	**Habitats Directive***
Brown Long-eared Bat(Plecotus auritus)	x	x		x
Red Squirrel (Sciurus vulgaris)	x	x	x	
Otter (Lutra lutra)	x	x		x

International
Annex 1*: EU Protected avian species under Annex 1 of EU Birds Directive
Habitats Directive* - EU Protected species under EU Habitats Directive
National
Schedule 1* - Avian species protected under the Wildlife & Countryside Act (WANE Act)
SBL*: Listed priority species on the Scottish Biodiversity List
UKBAP* - Listed in the UK Biodiversity Action Plan, as a priority species.
SAP* - Listed priority species on the UK Species Action Plan.

Further details of the above species are given within this section (6.3.4) in the paragraphs below. No nationally or internationally protected amphibian, reptile, invertebrate, floral species or aquatic species were recorded within the search area.

Ornithology

The Site lies within an area of low sensitivity for birds as per RSPB/SNH report Bird Sensitivity Map, (http://www.rspb.org.uk/Images/sensitivitymap_tcm9-157991.pdf) a data source compiled to provide locational guidance for onshore wind farms in Scotland (J. A. Bright et al. , 2006).

The agricultural setting in which the site is located provides suitable habitat for the barn owl. This schedule 1 species has been recorded at two unspecified locations within 2km of the site. Barn owls are low-flying birds, typically flying at approximately 3m above

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ground, putting them out of range of typical rotor swept heights and therefore at low risk from turbine collision. There is currently no known evidence to suggest that wind turbines in the UK are having a significant effect on Barn Owls (Barn Owl Trust, 2013). Additionally, there is also no suitable roosting potential for barn owl within 400m of the turbine location.

Barnacle geese have been recorded on numerous occasions within the NO55 grid square. However these records are all found at the Montrose Basin, an SPA site for over-wintering goose species (see Table 6-1). The closest of these records was 11km from the site. Given the distance from the Montrose Basin SPA (as well as Loch of Kinnordy SPA) and lack of goose records within 11km of the site, evidence suggests that no goose species are using the site for grazing, despite the arable habitats. Additionally, it is likely that any geese (inclusive of barnacle geese) flying over the site with be heading towards grazing and roosting sites (on or near SPAs), and therefore will be flying at heights well above the rotor swept height, putting them at no risk from turbine collision.

A two turbine site at Dubton Farm has been consented 5.7km from Netherton. This site lies on similar arable habitat at the same distance (11km) from Montrose Basin as the Netherton site. SNH's response to the submission stated that *''fields in and around the proposed development do not form part of the preferred foraging areas for pink-footed or greylag geese. Therefore, we consider there is no likely significant effect on the SPA qualifying species.''*

Two historical records of Kingfisher were recorded on watercourses within 2km of the site boundary. Kingfisher predominantly inhabits stream and riverbanks, and roosts in scrubs close to shallow open water. The species are unlikely to move away from close proximity to these riparian habitats and are a low-flying species, therefore are not considered to be at risk of turbine collision.

Ospreys are an annex 1 protected species; however the closest records of the species within NO55 are 11km from the site. Osprey is a summer migrant to the UK, and nests next to or nearby large water-bodies which provides their food source. As there are no suitable large water bodies within 10km of the site, it is very unlikely that Osprey would be recorded on or in flight over the site.

Individual recent records of both Scottish crossbill and capercaillie can be found within 10km of the Site. However, the habitats on and within proximity of the Site are unsuitable for both species, which typically inhabit native pine-forests (and other coniferous woodland). It is likely that both species were recorded within the Montreathmont Forest, a site know to contain capercaillie leks (breeding areas). It is very unlikely that either species would move out-with a forested area, particularly Capercaillie which is a poor (low height) flier.

Ecology

The intensive agricultural setting of the site is generally unsuitable for non-avian protected species such as badger, pine marten, water-vole and reptiles. No records of any of these species were found within the NO55 grid square.

Two records of brown long-eared bat are present within 5km. No suitable roosting habitats are present within the Site, or within 200m of the proposed turbine. Bat foraging opportunities are limited to ditch networks and woodland strips within the wider landscape, all in excess of 100m from proposed turbine blade tip to potential bat feature. The presence of soprano pipistrelle, the most common and widespread species in the Scotland, was recorded during surveys for the consented Dunswoods wind turbine site (see section 6.2.1). It was assessed that this species was not at risk from the proposed development.

Although habitat for otter exist within the wider area (two records within 5km of the Site) no suitable habitat is located within, or in close proximity (<200m) to the Site. Although the site is located 750m from a major watercourse, the habitat on site is unsuitable for otter use (both foraging and commuting), and no records for the species exist within 1km of the Site. It is therefore very unlikely that otter would use the site.

Numerous records of Red squirrel were found in the wider area, however these are confined to areas of woodland, particularly within Montreathment Forest. With only 1 small strip of woodland within 200m, it is extremely unlikely that red squirrel would be present near or within the Site.

The Site is located within the wider River North Esk catchment which is identified as salmonid waters under the Freshwater Fish Directive. Additionally it lies 750m out-with the South River Esk SAC (see table 6-1), a site designated for both Atlantic salmon and freshwater pearl mussel populations. There are no agricultural burns or other minor watercourses on, or nearby the site that have potential to support either species or be potentially connected to the SAC. Additionally no records over either species have been found within 10km of the Site.

6.4 Conclusions and Recommendations

There is only one statutory or non-statutory designated site within 5km of the Site, the River South Esk SAC. This site is designated for aquatic species which have not been recorded within 10km of the site and are restricted to riparian features. No suitable watercourses for either species are present on site, and the SAC shares no connectivity with the Site.

The wind turbine location on site has been selected to minimise the potential for impact on the local ecology; it is within an agricultural field and is situated at least 100m from trees and hedgerows which form the field boundary.

The Site itself does not have any habitats of nature conservation value or habitats which would be of value for any protected species and no records of protected species within or immediately adjacent to the Site exist.

The habitats around the Site although not of conservation value in themselves are capable of supporting some protected species such as foraging and commuting bats, otter, and red squirrel. Records of protected non-avian species are also absent from the Site and immediate environs.

Although the site and its environs have the potential to support barn owl, this species is not considered at risk from turbine collision due to its low flight height, and not likely to roost within 400m of the proposed turbine location. No other protected avian species are likely to use the site for roosting or foraging, or are considered to be at risk from turbine collision.

Due to the low environmental value of the Site, and range of known species in the area, we therefore consider that there is no potential for significant impact to ecological or ornithological receptors during the construction, operational and decommissioning phases of the project.

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7 Hydrology, Hydrogeology and Geology

7.1 Introduction

The construction, operation and decommissioning phase of a single wind turbine development has the potential to affect the hydrology and hydrogeology within the localised area via:

- Erosion and sediment transport;
- Potential polluting events affecting groundwater and surface water quality;
- Alteration of natural drainage patterns/runoff volumes and rates; and
- Increase in the magnitude or frequency of flood events.

The significance of the effect that the wind turbine development will have on the water and soil environment of the area will vary according to the magnitude of the potential effects and the sensitivity of the receptors.

7.2 Baseline Conditions

7.2.1 Topography and Climate

The development area generally comprises of arable farm land on the northern slope of small hill, near the Balnacake Farm property. The development will use the existing entrance from the public road B9734 towards Balmacake Farm. A new access track will be developed from north of Balnacake Farm to the turbine.

Site levels range from approximately 54m above ordnance datum in the north to approximately 110m above ordnance datum in the south. The site generally slopes steeply to the north. The turbine is positioned on a less steep section of the slope towards the hill summit at around 110m above ordnance datum. Average annual rainfall based on the Centre for Ecology and Hydrology (CEH) Website's spatial data map indicates the Standard Average Annual Rainfall (SAAR) from the 1960-1991 database to be between 750 and 800mm per year. The average rainfall for the River South Esk Catchment is 1093mm and for the local sub-catchment of Melgund Burn is 800mm based on the FEH CD ROM. This is considered to be a moderately dry climate for Scotland. Runoff from the development area is likely to be low, although during heavy rainfall events the runoff down the northern hill slopes could increase.

7.2.2 Catchment Hydrology

The majority of the runoff from the site flows to the north and northeast into un-named drains north of the B9734 public road or northeast into the Meglund Burn, which is a tributary of the River South Esk (Tayside). The drains to the north of the site appear to have been geomorphologically altered (or straightened) in parts for farming activities and therefore are not in their natural state. The Meglund Burn is a relatively steeply incised watercourse which appears to be culverted near the B9734 road beneath a recent housing development. The nearest water features potentially connected to the development are two field drains to the north located at least 300m from the access track and turbine.

The Meglund Burn is classified by the Scottish Environmental Protection Agency (SEPA) under their River Basin Management Plan (RBMP) as being of moderate ecological status as a result of diffuse source pollution and morphological changes from arable farming. The Meglund Burn catchment is a freshwater fish protected area for salmonids and is hydrologically linked to the River South Esk Special Area of Conservation (SAC) as part of the River Tay catchment.

No known designated areas are located within the proposed area or within 500m of the development area. The nearest designation is the River South Esk SAC located approximately 750m downstream of the development area designated for Atlantic salmon and Freshwater pearl mussel.

7.2.3 Flood Risk

No SEPA indicative flood plains are shown within the proposed development area.

The nearest SEPA indicated flood plain is greater than 150m down gradient of the access track and 500m down gradient of the turbine location associated with the River South Esk. This SEPA flood plain covers a wide area to north of the roads and roughly follows the 40m above ordnance datum contour. There are properties or receptors shown to be at risk of flooding within the River South Esk flood plain. The Meglund Burn to the east of the development area also has a small indicative flood plain

Anecdotal evidence from the landowner indicates there is no known localised flooding within the area and runoff is managed through the drains.

The risk of flooding within the development area and increasing the risk of flooding down gradient of the development area is low.

7.2.4 Geology

The drift or superficial geology underlying the all of the development area is shown to be Glacial Till comprising a diamicton of poorly sorted clay, sand and gravel.

No peat is shown on geological mapping within or near the development area.

The solid geology mapping shows the majority of the development area to be underlain by the Finavon Conglomerate Member comprising rounded clasts of sandstone and quartzite held together by a dark red sand and gravel matrix formed in the Devonian Period approximately 398 to 416 million years ago. To the south of the development area is underlain by the Scone Sandstone Formation. A fault is shown on geological mapping to trend northeast to southwest through the site. A geological fault line has the potential to act as a barrier for groundwater flow or more likely, a preferential pathway for groundwater flow.

The bedrock is classified as a locally important or low productivity aquifer, with any groundwater flow is generally constrained to being within fissures or discontinuities within the rock. Being a local aquifer, there is a potential for groundwater in the area to be used.

The development area is located on the South Esk bedrock and localised sand and gravel aquifer which is described by SEPA to be good in groundwater quantity and poor in relation groundwater quality as a result of diffuse pollution from arable farming. The site is within a groundwater Drinking Water Protection Area and Nitrate Vulnerable Zone.

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7.2.5 Water Resources

No water abstraction features or infrastructure are shown on OS mapping or aerial mapping within or in close proximity to the development area. Anecdotal evidence from the landowner, Bill Lamb, has indicated that there are no known PWS sources in or within 250m of the development and that the nearest properties (Balnacake, Melgund Mill, Netherton and Broomknowe Cottages) are currently on mains water supply. Historically, during the 1920s and 1930s local farms were on private water supplies from several boreholes that are now obsolete.

There are no known PWS sources within 250m of the development, therefore the risks to water resources is low to negligible.

7.3 Impact Assessment

7.3.1 Sensitive Receptors

Sensitive receptors identified for the proposed development area include:

- Megland Burn and drains to north of B9734 for being potentially hydrologically linked to the River South Esk (Tayside) SAC approximately 500m downstream of the site – high sensitivity.
- Groundwater is considered to be of low sensitivity as little resource is present beneath and no receptors (human users or groundwater dependent terrestrial ecosystems) have been identified.
- Flood risk is of low sensitivity as no SEPA flood plain is shown within the site and the development involves a small proportion of land take.

7.3.2 Potential Impacts

The potential impacts from the construction of the proposed wind turbine development are summarised below:

- Potential risk to surface water from the introduction of sediment into surface water run-off following activities such as access track construction, and turbine excavation and the dewatering of excavations;
- Impacts on hydrogeology due to dewatering of foundation excavations;
- Potential risks to surface water and groundwater resulting from the use and storage of fuels, oils and other potentially polluting substances;
- Potential risks to surface water and groundwater resulting from the pouring or leaching of concrete for the turbine foundation;
- Loss and sterilisation of soils due to the construction of access tracks and turbine footings; and,
- Slight increase in impermeable areas due to foundations, crane pads and access tracks.

7.3.3 Mitigation

The single wind turbine development has been designed to use existing tracks where possible to minimise the amount land take for the development. No watercourse crossings or drain diversions are required for the development.

The site infrastructure is located greater than 50m from watercourses or water features shown on 1:50,000 and 1:25,000 scale OS mapping. The nearest watercourse to the proposed development are two field drains (over 220m from the wind farm infrastructure) draining to River South Esk.

There are no known PWS features on the site or properties that are likely to be on PWS's identified within 250m of the turbine location or 100m from the access track.

The turbine location has been designed to avoid the geological fault shown on geological mapping.

The management of sediment laden runoff and concrete pouring will be main mitigation priorities for this development.

Access Tracks

Tracks will be stone-based and possess a camber to ensure rapid drainage (to avoid ponding and rutting which generates turbid water). Drainage will be collected and directed by strip drains to either infiltration drains or to areas of sufficient vegetation to promote the infiltration of the track runoff. Such measures will be based on the best practice guidelines and will lead to minimal changes on surface water regime.

Any silty water generated on site will ideally be settled out as much as possible through drainage mitigation measures (silt traps etc.) and channelled into vegetated areas at least 20m from any water body to allow the settlement of suspended solids. Silt traps, gravel, sand bags, silt fencing and anchored straw bales may be required at the discharge points in order to prevent erosion at the outlet, alleviate flow and aid in flow dispersion across a wider area of vegetation to prevent potential scour and remobilisation of deposited silt.

Discharge points will be located a sufficient distance from any water body to allow adequate infiltration or settlement of suspended solids to prevent any discharged surface runoff potentially entering the water bodies. Direct discharge to water bodies will not be permitted.

Wind Turbine and Crane Pad

Construction mitigation and enhancement measures detailed below will ensure risks are minimised during the construction of the wind turbine and crane pad.

The turbine foundation will be formed through the pouring of concrete. Without controls on this process, concrete spillages could potentially result in pollutants coming into contact with local groundwater or surface water. Temporary bunds should be placed around pouring operations to contain concrete spillages and a spill response protocol should be developed for use by contractor.

As detailed in the baseline description, the geology underlying has limited local groundwater potential. Prior to concrete pouring in the turbine excavation, the degree of weathering of bedrock should be assessed. It may be necessary to use a protective geotextile liner within the excavation to ensure liquid concrete does not come into contact with underlying strata and shallow groundwater. A geotextile liner would restrict the flow of concrete into the surrounding groundwater. This would only be necessary if there was evidence of significant fracturing and groundwater flow. Given the nature of the geology, it is considered that the likelihood of encountering groundwater is unlikely.

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Should shallow groundwater be encountered during construction of the turbine foundation, any dewatering required should be pumped to a small holding sump to allow removal of suspended sediments. Once the solids have been removed, groundwater should either be discharged direct to surrounding vegetation or a small down slope trench allowing infiltration back into the ground. Any discharge should be in agreement with the SEPA and be in accordance with Water Environment (Controlled Activities) Regulations (CAR) 2011 (as amended in 2013). Any untreated discharge should be directed away from water bodies.

A trench (2m wide) down gradient of the turbine could be used to collect and attenuate any overland/surface flow. This will intercept any overland flows, allow some settling out of sediments from the water column and ensure no increased flood risk to the neighbouring or down gradient areas identified.

Site Activities

Good working practices will be adopted throughout the construction works to protect the water environment, ecology and human health. The storage of oil, fuel and other substances will be within a designated area. SEPA's General Binding Rules dictate that oil and fuel will be stored within impervious storage bunds (or double skinned tanks) with 110% capacity of the largest tank or 25% of the total storage capacity, whichever is greater, so that any spillages or leaks are contained. All tanks, whilst designed to provide more storage volume than needed, may be fitted with alarms to warn site workers if the volume exceeds a specified level. Machinery should be routinely checked to ensure they are in good working order and spill kits should be on site in case of a spill.

7.4 Conclusions and Recommendations

The hydrological setting for this single wind turbine development is considered to be of low to medium risk. Hydrologically sensitive receptors to the development include the Melgund Burn and un-named drains to the north being hydrologically connected to the River South Esk SAC approximately 500m downstream of the site. The proposed turbine is located over 300m from the nearest known surface water features down gradient of the infrastructure allowing a suitable distance to manage and mitigate any potential sediment laden waters or pollutants from entering the watercourses including an attenuation trench down gradient of the turbine to minimize in runoff rates down gradient. No private water supply sources or infrastructure are known within 250m of the development area. With the appropriate mitigation undertaken in accordance with best practice guidance the risks to the water and soil environment are considered to be minor and therefore insignificant.

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8 Cultural Heritage

8.1 Introduction

This section considers the likely effects on the Historic Environment of the construction, operation and decommissioning of the proposed development and associated infrastructure.

8.2 Methodology

8.2.1 Information Sources

A desktop study was undertaken to identify any features of cultural heritage significance within 5km of the proposed development using Pastmap and the Local Historic Environment Record, historic maps and other relevant sources.

A desktop search was also undertaken for publicly available information in relation to existing or proposed wind farms/turbines within the local area.

8.2.2 Assessment Methods

Significance of effect was determined with respect to the sensitivity of the baseline conditions and the predicted magnitude of effect. As described in detail below, this assessment was undertaken separately for direct effects (e.g. damage or severance) and indirect effects (i.e. changes to cultural heritage setting owing to visual intrusion).

Sites were assigned a level of importance on a scale of 'less than local' to 'international', as shown in Table 8-1. This was established on the basis of statutory designation and/or assessed cultural heritage importance.

Table 8-1: Cultural Heritage Importance

Importance	Site Type
International	World Heritage Sites.
National	Scheduled Monuments. Category A Listed Buildings. Gardens and Designed Landscapes Some undesignated sites assessed as being of national importance.
Regional	Category B Listed Buildings. Battlefield Sites Conservation Areas. Some undesignated sites assessed as being of regional importance.
Local	Category C(s) Listed Buildings Some undesignated sites assessed as being of local importance.
Less than local	Sites either already badly damaged, destroyed or whose historic value is too slight for inclusion in a higher class.

World Heritage Sites are afforded international protection under the UNESCO World Heritage Convention, with Scheduled Monuments nationally protected under the 'Ancient Monuments and Archaeological Areas Act 1979'. The 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' provides for the designation of Category, A, B and C(s) Listed Buildings which are considered to be of national, regional and local importance respectively.

Conservation Areas are assessed as being of Regional importance, and Designed Landscapes are assessed as being of national importance, following discussion with Historic Scotland on previous projects.

Many sites of cultural heritage importance are not currently afforded any statutory protection through designation. For the purposes of assessment, these undesignated sites were assigned a level of importance using professional judgement supported by review of the following guidance:

- criteria used in Scottish Historic Environment Policy (SHEP 23) for the designation of SAMs (Historic Scotland, 2009); and
- non-statutory criteria used in the designation of Listed Building categories (Memorandum of Guidance on Listed Buildings and Conservation Areas; Historic Scotland, 1998 and SHEP 23).

Direct Effects

Direct impacts may be caused by a range of activities during the construction phase of development, including ground disturbing excavations for turbine foundations; crane pads; access tracks; borrow pits; storage and compound areas and cable and service trenches. Direct impacts on cultural heritage features are normally adverse, permanent and irreversible. The significance of predicted direct effects (i.e. physical disturbance) (Table 8-4) was determined taking into account the importance of the archaeological resource affected (Table 8-2), and the magnitude of the effect (Table 8-3).

Table 8-2: Magnitude of Direct Effects on Cultural Heritage Sites

Magnitude	Criteria
Very Severe	Disturbance to over 75% of the known or estimated area of the site
Severe	Disturbance to between 50% and 75% of the known or estimated area
Medium	Disturbance to between 25% and 50% of the known or estimated area of the site
Negligible	Disturbance of up to 25% of the known or estimated area of the site

The assessment of significance of effect was further adjusted as appropriate using professional experience to take into account the relative importance of the specific parts of the site that would be affected. For instance, an effect which is of 'very severe' magnitude in terms of the area of the site affected may nevertheless only affect peripheral features, while a 'medium' magnitude effect may affect the core of a site. Other qualitative factors taken into account include potential severance of linked features, nature of the severed linkage, the amount of stratigraphy which would be disrupted, and the overall effect on the historic integrity of the site.

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Table 8-3: Significance of Direct Effects on Cultural Heritage

Magnitude / Importance	Very Severe	Severe	Medium	Negligible
National	Substantial	Substantial	Moderate	Slight
Regional	Substantial	Moderate	Slight	Negligible
Local	Moderate	Slight	Slight	Negligible
Less than Local	Slight	Negligible	Negligible	Negligible

Indirect Effects (Setting)

Many archaeological sites are not visible, or barely visible, from ground level. Such sites will not usually be vulnerable to visual effects i.e. effects on setting. However, some invisible or partially visible sites may be located in an area where the immediate topography and landscape is important to an understanding of the site, and consequently the setting and location might be more sensitive.

A selection process was undertaken to identify cultural heritage sites that may receive/have indirect setting effects arising from/as a result of the proposed development. Their sensitivity to indirect visual effects [on their setting] was separately determined according to the definitions in Table 8-5.

Table 8-4: Sensitivity of Cultural Heritage Sites to Effects on Setting

Sensitivity of Receptor	Definition
High	Sites of national importance that are visually prominent and whose setting contributes significantly to their importance; invisible or partially visible sites of national importance whose location and topographical context aid our understanding of their form and function.
Medium	Sites of regional importance that are visually prominent and whose setting contributes significantly to their importance; invisible or partially visible sites of regional importance whose location and topographical context aid our understanding of their form and function.
Low	Sites of local importance whose landscape setting contributes significantly to their importance. Sites of local importance whose landscape setting contributes significantly to their importance.
Negligible	Sites whose landscape setting is of negligible importance

The magnitude of effects on the setting of cultural heritage sites was assessed according to established principles and criteria set out in published guidance (Memorandum of Guidance Historic Scotland 1993, Managing Change in the Historic environment (Setting) Historic Scotland 2010 and Guidelines for Landscape and Visual Effect Assessment (LI/IEMA, 2002). These criteria were also used in the assessment of overall visual effects, and are described in more detail in Section 4 (Landscape and Visual). The application of the criteria leads to a determination of the magnitude of effect for each viewpoint on a four-point scale of 'Dominant', 'Prominent', 'Present' or 'Negligible'. Each viewpoint was selected and identified as the most appropriate location for assessment of inter-visibility. This process was undertaken using the 'best' views to and from the monument allied to its landscape setting and the topography as it relates to the site and any other associated sites in the general landscape. Any inter-visibility with the proposed Development was then assessed from this location.

Effects on setting were assessed using Zone of Theoretical Visibility (ZTV) mapping, and the creation of wireframes to indicate the potential views of the wind turbine. This represents worst-case assessment, as it assumes no intervening ground cover screening such as woodland or other buildings.

As with direct effects, the significance of effects on setting was determined taking into account the importance of the archaeological resource affected, and the magnitude of effect. For each site, the viewpoint taken into consideration was the one with the greatest magnitude of effect. Table 8-5 illustrates the matrix of importance used to determine the significance of effect on setting.

Table 8-5: Determination of Significance of Effects on Setting

Magnitude / Sensitivity	Dominant	Prominent	Present	Negligible
High	Substantial	Substantial	Moderate	Slight
Medium	Moderate	Moderate	Slight	Negligible
Low	Slight	Negligible/Slight	Negligible	Negligible

8.3 Assessment Results

There are no direct effects on cultural heritage features based on the findings of the desk-based assessment, with no local or regional features discovered within the site boundary. There may be indirect effects arising from the development where it alters the setting of a feature. According to policy guidance, such effects are normally considered more significant to designated features of national importance, namely Scheduled Ancient Monuments (SAMs), 'A' listed buildings and Gardens and Designed Landscapes (GDLs). A list of the nearest features of national importance within 5km of the Netherton turbine can be seen below.

- SAMs:
  - Broomknowe Enclosure (600m north)
  - Netherton Enclosure (1.3km west)
  - Netherton Settlement (1.5km southwest)
  - Middle Drums Ring Ditches (3.0km east)
  - Melgund Cottage Cairn and Enclosure (3.3km southwest)
  - Balbinny Enclosure (3.4km southwest)
  - Mains of Careston Barrows (3.0km northwest)
  - Craigend of Careston enclosure (2.9km north northwest)
  - Killievair stone standing stone (3.1km north)
  - Broomfield Enclosure (3.3km north northeast)
  - Flemington Tower, Aberlemno (4km southwest)
  - Brechin, Maison Dieu Chapel (4.3km northeast)
  - Aberlemno churchyard, cross slab and symbol stones (4.4km southwest)
  - Brechin Cathedral Round Tower (4.2km northeast)
- 'A' listed buildings:
  - Kintrockat House (1.6km north northeast)
  - Melgund Castle (2.0km southwest)

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  - Baptist Church and Halls, Panmure street/southesk street (4.7km northeast)
  - Gardner memorial church, St Ninian's square and Damacre road (4.9km northeast)
  - Ardovie house (3.6km southeast)
  - Maison Diue Chapel Maison Dieu Lane (4.6km northeast)
  - Brechin Bridge over River South Esk off River Street (4.9km east)
  - Round Tower at South West Angle of Cathedral church lane (4.4km northeast)
  - Stannochy Bridge (2.7km northeast)
  - Brechin Cathedral church lane (4.3km northeast)
  - Brechin Castle (4.3km northeast)
  - 68-74 High Street (4.4km northeast)
  - 25,27 High Street (4.4km northeast)
  - Careston Castle (3.6km northwest)
- GDLs:
  - Brechin Castle (2.8km northeast)
- Conservation Areas
  - Brechin Town Centre (4.2km northeast)
  - Brechin St Ninian's Square (4.7km northeast)

A review of the SAMs and A-listed buildings within 5km of the site has been completed and the results presented in Table 8-6.

Table 8-6: SAMs and A-listed buildings within 5km of proposed turbine

SAM/A Listed Building	Distance to Turbine	Comments	Significance
Killievair stone, Standing stone, barrelwell smithy	3.1km	Stone on a low ridge with predicted visibility of the turbine. Impacts on the setting of the feature considered to be minimal	Minor
Flemington Tower, Aberlemno	4.0km	Remains of a towerhouse of early seventeenth century. The ZTV shows that the turbine will be visible from this SAM. Indirect effects of a low magnitude of impact are predicted.	Minor
Craigend of Careston Enclosure	2.9km	Remains of an enclosed settlement which lies on a low ridge in arable farmland. ZTV shows the turbine will be visible from this SAM. Indirect effects of a low magnitude of impact are predicted.	Minor
Mains of Careston, barrows	3.0km	Remains of two round barrows of prehistoric date which lie on sloping arable farmland. Screened by woodland to the southeast, impact is considered to be minimal	Negligible
Netherton Enclosure	1.3km	Remains of an enclosed settlement of prehistoric date represented by cropmarks visible on oblique aerial photographs in arable farmland. ZTV's show that the turbine will be visible from this SAM. Indirect effects of a low magnitude of impact are predicted.	Minor
Netherton Settlement	1.5km	Ancient settlement represented by cropmarks visible on oblique aerial photographs in arable farmland. ZTV's show that the turbine will be visible from this SAM. Indirect effects of a low magnitude of impact are predicted.	Minor
Middle Drums, Ring ditches	3.0km	Remains of two ring ditch houses screened by woodland to the east. Impact is considered to be minimal.	Negligible
Broomfield Enclosure	3.3km	Remains of an enclosed settlement of prehistoric date screened by woodland to the south. Impact is considered to be minimal.	Negligible
Balbinny Enclosure	3.4km	Remains of an enclosed settlement of prehistoric date. ZTV's confirm that the proposed turbine will not be visible from this location.	Negligible
Broomknowe Enclosure	600m	Comprises the remains of an enclosed settlement of prehistoric date represented by cropmarks visible on oblique aerial photographs. ZTV's confirm that the turbine will be visible from the SAM. Indirect effects of a moderate magnitude of impact are predicted due to proximity to the proposed turbine.	Moderate
Melgund Cottage Cairn and Enclosure	3.3km	Remains of a cairn and enclosure of prehistoric date. ZTV's confirm that the proposed turbine will not be visible from this location.	Negligible
Brechin Maison Dieu Chapel	4.3km	Surviving fragment and remainder of the site of the chapel which served Maison Dieu hospital in Brechin. Screened by woodland to the southwest. Impact is considered to be minimal.	Negligible
Aberlemno Churchyard, Cross slab and symbol stones	4.4km	Two symbol stones and a cross slab of Pictish date. ZTV's confirm that the turbine will be visible from the SAM. Indirect effects of a low magnitude of impact are predicted.	Minor
Brechin Cathedral round tower	4.2km	Round tower at the southwest angle of the nave of Brechin Cathedral. Screened by woodland to the southwest. Impact is considered to be minimal.	Negligible
68-74 High Street	4.4km	Building is screened by woodland to the southwest restricting views to the	Negligible

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SAM/A Listed Building	Distance to Turbine	Comments	Significance
		turbine. At 4.4km, the impact is considered to be minimal.	
Kintrockat House	1.6km	Building is screened by woodland to the south restricting views to the turbine. At 1.6km, the impact is considered to be minimal.	Minor
Melgund Castle	2.0km	ZTV's show that the turbine will be visible from this Listed building. At 2km, indirect effects of a moderate magnitude of impact are predicted.	Moderate
Baptist Church (formerly West and St Columba's Parish Church) and Halls, Panmure Street/South Esk Street	4.7km	Building is screened by woodland to the southwest restricting views to the turbine. At 4.7km, the impact is considered to be minimal.	Negligible
Gardner Memorial Church, St Ninian's Square and damacre Road including Church Halls and Vestries.	4.9km	Building is screened by woodland to the southwest restricting views to the turbine. At 4.9km, the impact is considered to be minimal.	Negligible
Ardovie House	3.6km	ZTV's show that the turbine will be visible from this Listed building. Indirect effects of a low magnitude of impact are predicted.	Minor
Maison dieu Chapel Maisondieu lane	4.6km	Screened by woodland to the southwest restricting views to the turbine. At 4.6km, the impact is considered to be minimal.	Negligible
Brechin Bridge over River south Esk off River Street.	4.9km	Screened by woodland to the southwest restricting views to the turbine. At 4.9km, the impact is considered to be minimal.	Negligible
Round tower at south west angle of Cathedral Church lane	4.4km	Screened by woodland to the southwest restricting views to the turbine. At 4.4km, the impact is considered to be minimal.	Negligible
Stannochy Bridge	2.7km	Screened by woodland to the southwest restricting views to the turbine. At 2.7km, the impact is considered to be minimal.	Minor
Brechin Cathedral Church lane.	4.4km	Screened by woodland to the southwest restricting views to the turbine. At 4.4km, the impact is considered to be minimal.	Negligible
Brechin Castle	4.3km	Listed building within a GDL, screened by woodland to the southwest restricting views to the turbine. The impact on the setting of the GDL is considered to be minimal.	Minor
25, 27 High Street	4.4km	Screened by woodland to the southwest restricting views to the turbine. At 4.4km, the impact is considered to be minimal.	Negligible
Careston Castle	3.6km	Screened by woodland to the southeast restricting views to the turbine. At 3.6km, the impact is considered to be minimal.	Negligible
Brechin Town Centre	4.2km	Conservation area screened by woodland to the southwest. At 4.2km, the impact on the setting is considered to be minimal.	Negligible
Brechin St Ninian's Square	4.7km	Conservation area screened by woodland to the southwest. At 4.7km, the impact on the setting is considered to be minimal.	Negligible

8.4 Conclusion

It is considered that there are no direct effects from the proposed development on archaeological or cultural heritage features. The proposed Netherton turbine will be 600m from the nearest national designation for cultural heritage with the majority of the designations screened from the proposed turbine by topography and woodlands. It is considered that any impacts on the settings of majority of these designated features will be of minor significance. Impacts on the setting of Melgund Castle and Broomknowe Enclosure are considered to be moderate as a result of proximity to the proposed turbine and direct views.

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9 Shadow Flicker

9.1 Introduction

The web based guidance which supersedes PAN 45 only provides limited advice on shadow flicker stating that *"shadow flicker can only occur within buildings where the flicker effects appear through a narrow window opening. The seasonal duration of this effect can be calculated from the geometry of the machine and the latitude of the potential site"* and further that *"the effect diminished with distance and that flicker effects are likely only to occur within ten rotor diameters of a turbine"* (Scottish Government, 2011).

A recent report by consultants Parson's Brinkerhoff for the Department of Energy and Climate Change (DECC, 2011) reviewed the UK evidence base on shadow flicker by carrying out a review of international guidance, literature review and investigation of current assessment methodologies employed by developers. This report concluded that the assumption of ten rotor diameters as a suitable area for investigation and 130 degrees either side of north was acceptable. Furthermore the study concluded that there is a need to address 'worst-case' and what is realistic in shadow flicker assessments.

Planning for Renewable Energy: A Companion Guide to PPS 22 (2004) considers the issue of shadow flicker in paragraphs 73-78, the key points are:

- Shadows may be cast from wind turbines over neighbouring properties under certain conditions as the sun may pass behind the rotors of a wind turbine;
- When the blades rotate, the shadow flicks on and off; the effect is known as 'shadow flicker';
- Shadow flicker only occurs inside buildings where the flicker appears through a narrow window opening;
- It can be calculated from the geometry of the machine and the latitude of the site and the likelihood of it happening depends upon a number of factors such as the time of year; cloud cover and prevailing wind direction;
- Only properties within 130 degrees either side of north, relative to the turbines in the UK can be affected;
- The further the observer is from the turbine the less pronounced the effect will be; and
- Flicker effects have been proven to occur only within ten rotor diameters of a turbine.

There is no national planning policy or guidance in Scotland which deals with 'exposure' to shadow flicker effects in terms of acceptable periods for duration. There is, however, guidance in Northern Ireland which recommends that shadow flicker at neighbouring offices and dwellings within 500m should not exceed 30 hours per year or 30 minutes per day (DOENI 2009). This is based on research by Predac, a European Union sponsored organisation promoting best practice in energy use and supply which draws on experience from Belgium, Denmark, France, the Netherlands and Germany.

9.2 Assessment Methodology

A shadow flicker assessment has been undertaken for the proposed development. The potential effects of shadow flicker were modelled using WindFarmer software (v5.2.11.0 Garrad Hassan). The software creates a mathematical model of the development and its surroundings based on:

- Turbine locations, hub height and rotor diameter;
- Topography based on Ordnance Survey 50m DTM data; and
- Latitude and longitude of the development (used in calculating the position of the sun in relation to time of day and year.

The calculation is run for a worst-case scenario which includes the following assumptions:

- Weather conditions are such that shadows are cast during every day of the year, i.e. bright sunshine every day;
- The turbine rotor will always be facing directly towards a given window, maximising the size of the shadow and hence frequency and duration of the effect;
- The turbine are always rotating; and
- There will not be intervening structures or vegetation (other than topography) that may restrict the visibility of a turbine, preventing or reducing the effect.

When the factors above are accounted for, the likely actual incidence of shadow flicker will be substantially less than that predicted based on the worst-case scenario.

9.3 Assessment Results

Of the surrounding residential dwellings, a property at Balnacake (NGR 355787, 757443) lies within 10 rotor diameters (maximum of 540m for the turbine size under consideration) and within the potential area of shadow casting from the turbine (130 degrees either side of north).

The shadow flicker model has predicted that shadow flicker could occur at this property based on the worst case conditions and taking no account of weather conditions or the orientation of turbine and property windows.

The shadow flicker model predicts shadow flicker occurrence as shown in Table 9-1 below.

Table 9-1: Shadow Flicker results

Receptor	Maximum Days per year	Maximum hours per year	Maximum Minutes per day	Period likely to Occur	Theoretical Occurrence Period
Balnacake	44	14	26	29/04-20/05	04:56-05:22
				24/07-14/08	05:07-05:30

Assuming worst case scenario, no more than 30 minutes of shadow flicker would be experienced in any one day at the Balnacake property.

9.4 Mitigation

It has been demonstrated that shadow flicker is theoretically capable of occurring at one neighbouring residential property. This theoretical potential does not take into

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account a number of property specific factors that can preclude shadow flicker from occurring mainly whether the property has windows facing the development site and whether the effects may be screened by trees or buildings. There is, therefore, no certainty that shadow flicker will occur in practise or that, if it does occur, it will give an unacceptable effect on amenity.

Any incidence of shadow flicker can be completely avoided by programming the wind turbine to shut down at appropriate time of the day/year. This has been proven to provide complete avoidance of the issue at a number of operational sites across the UK (DECC 2011).

Alternatively other forms of mitigation including blinds and vegetation planting for screening purposes can be agreed with the potentially affected residents.

9.5 Summary

Based on an initial assessment of the properties surrounding the development it is considered that there will be significant effects associated with shadow flicker at Balnacake property. These effects do not exceed the guidance limits and are modelled on a worst case scenario basis. In the event that Shadow Flicker does occur, mitigation will be put in place to avoid any adverse impacts of shadow flicker on the property.

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10 Aviation, Radar and MOD

10.1 Aviation and Radar

Wind turbines have the ability to reflect radio waves and, therefore, have the potential to interfere with radar systems. Reflections from the rotating wind turbine blades may show up on radar as 'clutter'. Wind turbines can also reflect away some of the emitted radar signal and the 'echo' from aircraft in a line of sight from the radar, beyond the turbines. Such effects could have an adverse impact on aircraft safety.

The site lies outside the official 17km consultation zone for the closest civil aviation aerodrome, which is Dundee Airport. The Dundee airport has no radar facilities and no issues are anticipated.

The British Aviation Authority (BAA), the Civil Aviation Authority (CAA) and National Air Traffic Systems (NATS) no longer comment on proposals during the pre-application process however a proforma has been filled and sent to them.

10.2 Ministry of Defence (MOD)

The proposed site lies approximately 34km north of the nearest MOD infrastructure, RAF Leuchars radar. At this distance, the proposed turbine is not predicted to have an impact on MOD operations.

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11 Television and Communication Links

11.1 Television Reception

Wind turbines have the potential to adversely affect domestic television reception through either physical blocking of the transmitted signal or, more commonly, by introducing multi-path interference where some of the signal is reflected through different routes. Multi path interference to television signals can cause 'ghosting' on older analogue transmissions where an object in the picture appear several times in different positions. This effect rarely extends beyond 2km from a turbine between the receiver and transmitter.

There are however a number of measures that can be taken to reduce or overcome any interference effects including:

- The provision of a more sensitive receiver antenna for affected households;
- Re-positioning of the antennae to receive signals from a different transmitter;
- Installation of a local community re-broadcast facility; and
- An alternative means of transmission, such as a satellite or cable.

The proposed development is located in area which has been served by a digital transmitter and, therefore, is unlikely to be affected by the development of the wind turbine as digital signals are rarely affected. In the unlikely event that television signals are proven to be affected by the proposed development, the mitigation measures discussed above will be considered by the applicant.

11.2 Telecommunications

The moving rotors of wind turbines have the potential to impact on telecommunication signals by causing Electromagnetic Interference (EMI). Wind turbines cause EMI by reflection of signals from rotor blades so that a nearby receiver picks up both a direct and reflected signal. The types of civilian and military communication signals which may be affected by EMI include TV and radio broadcasting, microwave and cellular radio communications and various navigational and air traffic control systems. A turbine located within, or near to, the communication link may interfere with the signal causing unwanted 'noise'.

Consultations were undertaken with Ofcom, Joint Radio Company (JRC) and Atkins.

Ofcom identified one link operator (Ericsson) within 1.5km of the proposed site. Consultations were made with "Ericsson" on 28/10/13 with a follow up mail sent on 19/02/14 and a "no objection" response was received on 21/02/14.

JRC objected to the proposed development on 30/08/13 and after further consultation with them and site design to take the identified links into account, a "no objection" response was received from JRC on 23/01/14.

Information on the nearby EMI links can be found in Table 11-1.

Table 11-1: EMI Link details

Link Operator	Start point station name	Start point co-ordinates	End point station name	End point co-ordinates	Path Length
JRC	Dunnichen Hill	NGR 350800, 749700	Edzell SS	NGR 363500, 770500	24,303m
JRC	Dunnichen Hill	NGR 350800, 749700	Inchbare Pri	NGR 360600,765300	18,377m
Ericsson	Finnavon	NGR 350170, 757515	MCL Brechin	NGR 358830, 757915	8.6km

Based on the consultations undertaken and the information available, it is considered that the proposed development will have no adverse effects in relation to television and communication links.

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12 Transport and Access

12.1 Baseline

12.1.1 Access Route to Site

The potential route to site was assessed through desk based assessment by Atmos. The route via the A90, A932 and B9134 was deemed to be the most suitable route due to knowledge of similar loads using this trunk road and the suitability of the roads to accommodate the associated loads.

12.1.2 Preferred Landing Port for Abnormal Loads

The Port of Dundee has been identified as a suitable landing port for turbine components.

12.1.3 Proposed Route for HGVs to Access Site

Deliveries of concrete and aggregate will constitute the majority of the HGV loads generated. The nearest suitable quarry will be selected to supply the materials to ensure travel times are kept as low as reasonably possible.

12.1.4 Upgrades to the Public Road System

A suitable site entrance will be constructed off the B9134 to allow safe access onto site. It is not predicted that any additional upgrades to the public road system will be required but this will be confirmed once a specialist haulier has been appointed.

12.1.5 On Site Access

The technical specification of onsite tracks will be finalised in accordance with the selected turbine manufacturer. A total of approximately 703m of upgraded access track and 520m of new access track are required from the site entrance at NGR 355142, 757792 off the B9134 road to the wind turbine location.

12.2 Construction Impacts

12.2.1 Abnormal Loads during Construction

The vehicles used to transport turbine components would constitute abnormal loads only on the delivery phase of the journey since the extendible trailers are retracted to the size of a standard articulated vehicle (16.5m) during the return leg.

12.2.2 Potential HGV Loads during Construction

HGV traffic is typically slow moving and can, therefore, cause delays to normal traffic movements particularly on smaller roads.

It can be difficult to ascertain the maximum number of vehicles per day during the construction period as different activities may be scheduled concurrently while most activities must happen in sequence. Typically HGV movements are at their highest when concrete foundations are being poured as there is a requirement for a continuous pouring operation. As it is proposed to import concrete in ready-mix trucks, deliveries will have to be near continuous over a single day to complete the concrete pour.

Concrete and aggregate deliveries will come from a suitably identified quarry located as close to the site as reasonably possible so travel times and therefore disruption times will be kept to a minimum.

12.3 Summary

The construction of the proposed turbine would result in a small temporary increase in traffic levels on the proposed access routes.

A suitable route for transporting abnormal loads, such as turbine components involves the use of the A90, A932 and B9134.

Abnormal loads would be scheduled to occur during off-peak periods, at a time to be agreed with relevant bodies in order to minimise delays to other road users.

With the implementation of mitigation measures such as suitable liaison with relevant transport authorities, the residual traffic and transport effects on the road network will be minimal.

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13 Public Access and Recreation

13.1 Health and Safety

A number of health and safety considerations have been taken into account during the environmental assessment process and design of the proposed development. These include:

- Public roads;
- Overhead power lines;
- General turbine safety;
- Rights of way;
- Extreme weather such as lightening and ice throw;
- Public safety and access; and
- Health and safety during construction.

13.1.1 Public Roads

The proposed turbine is located approximately 336m south of the B9134. At this distance no safety concerns are predicted.

13.1.2 Overhead Power Lines

There are no power lines in close proximity to the turbine location and no issues are expected. The nearest transmission power line is approximately 920m northwest of the proposed turbine location.

13.1.3 General Turbine Safety

Wind energy projects have a proven track record of safety. A small number of wind turbines have been known to lose parts of the rotor assembly through accidental damage due to lightning, mechanical failure or extreme gale force winds. However, no member of the public has ever been injured during the normal operation of a wind turbine (Renewable UK, 2010c).

The safe operation of turbines is ensured through a combination of design, quality control and manufacture to high safety standards. The developer will require that the selected wind turbine model will have certification from an internationally recognised authority and have a proven track record of safe operation. The wind turbine installed at the site will comply with BS EN 61400-1: 'Wind turbine generator systems - safety requirements'.

It is not anticipated that there will be much on-site activity once the wind turbine is fully installed and operational. The primary safety systems at the site will include a computerised central control system housed within the substation building. This system will continually monitor the operational status and safe working of key components for the turbine and will allow the operator to remotely monitor the turbine via a modem. Any problems that cannot be resolved by the internal computer will be referred to the operator via the computer's modem link and addressed as soon as possible.

13.1.4 Right of Way/Core Paths

There are no rights of way or core paths in the close proximity of the site.

13.1.5 Extreme Weather

Lightning Strike

Wind turbines can be susceptible to lightning strike due to their height and appropriate measures are taken into account in the design of turbines to conduct lightning strikes down to earth and minimise the risk of damage to turbines. Occasionally however, lightning can strike and damage a wind turbine blade. Modern wind turbine blades are manufactured from a glass-fibre or wood-epoxy composite in a mould, such that the reinforcement runs predominantly along the length of the blade. This means that blades will usually stay attached to the turbine if damaged by lightning and in all cases turbines will automatically shut down if damaged by lightning.

Ice Throw

Ice build-up on blade surfaces occurs in cold weather conditions. Wind turbines can continue to operate with a very thin accumulation of snow or ice, but will shut down automatically as soon as there is a sufficient build up to cause aerodynamic or physical imbalance of the rotor assembly. Potential icing conditions affecting turbines can be expected 2-7 days per year (light icing) in Scotland (WECO, 1999).

The potential for ice throw to occur after start up following a turbine shut down during conditions suitable for ice formation is high. There are monitoring systems and protocols in place to ensure that turbines that have been stationary during icing conditions are restarted in a controlled manner to ensure public safety. The risk to public safety is considered to be very low due to the few likely occurrences of these conditions along with the particular circumstances that can cause ice throw. Despite the recent winters of 2009/2010 and 2010/2011 being unusually icy, there were no recorded incidences of ice throw injury to the public or the operational staff at any wind turbine site in UK.

13.1.6 Public Safety and Access

The Renewable UK Health and Safety Guidelines state that *"it is the responsibility of wind farm designers to ensure that the wind turbines and associated equipment are designed to avoid or, where this is not entirely possible, to minimise risks to health and safety whilst they are being assembled, constructed, installed, operated, maintained and decommissioned"* (Renewable UK, 2010a). The guidance stipulates the need to ensure potential risks to non-industry personnel i.e. members of the public, are addressed throughout the life phases of projects and that residual risks are acceptable when compared with people's expectations of day to day risk exposure (Renewable UK, 2010a).

Site security and access during the construction period will be governed under Health and Safety at Work Act 1974 and associated legislation. There will be no public access to the site during construction. Once the construction period and commissioning of the wind farm is complete, no special restriction on access is proposed.

The site is not identified as an area used for formal recreation. However, the Land Reform (Scotland) Act (2003) which came into effect in February 2005 establishes

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statutory rights of responsible access on and over most land. The legislation offers a general framework of responsible conduct for both those exercising rights of access and for landowners. Informal recreational access would benefit from the presence of the turbine within the site by providing a feature of interest.

Appropriate warning signs will be installed concerning restricted areas such as transformers, switchgear and metering systems. All on site electrical cables will be buried underground with relevant signage.

13.1.7 Health and Safety during Construction

A number of activities outlined in Chapter 2, during the construction phase of the project have potential to injure workers and members of the public. All site work will comply with the following relevant regulations:

- The construction (Design and Management) Regulations 2007 approved code of practice;
- The Health and Safety and Work Act 1974;
- The Management of Health and Safety at Work Regulations 1999;
- Provision and Use of Work Equipment Regulations 1998;
- The Works at Heights Regulations 2005; and
- Control of substances hazardous to Health 1999.

The essence of this legislation is to ensure the safe operation of the construction site and the health and safety of all employees, contractors, visitors, self-employed people and members of the public who may have access to the site. Construction activities will also take account of the Renewable UK Guidelines for Health & Safety in the Wind Energy Industry Sector (Renewable UK, 2010a) and the Management of Health and Safety at work Regulations 1999.

Renewable UK has also produced the Wind Turbine Safety Rules (WTSR) which clearly specifies actions and procedures which have to be followed in order that persons working on wind turbines are safeguarded from inherent dangers that exist from the installed electrical and mechanical equipment in wind turbines (Renewable UK, 2010b). All construction activities and other site works will comply with these rules.

A construction Health and Safety Plan will be developed to manage safety during construction.

When not in use, potentially hazardous machinery will be stored in the secure construction compound to prevent use by unauthorised persons. Normal site safety procedures will be strictly enforced including displaying the appropriate signage concerning restricted areas.

13.2 Other Infrastructure

13.2.1 National Grid Gas Pipeline

A linesearch has been carried out and there are no national Grid pipelines in proximity to the proposed turbine that can be affected by the development.

13.3 Summary

The proposed site is a working farm with limited public access which is unlikely to change during the operational life of the wind turbine.

The safe operation of the turbine is ensured through a combination of design, quality control and manufacture to high standards. The developer will require that the selected wind turbine model will have certification from an internationally recognised authority and have a proven track record of safe operation. The wind turbine installed at the site will comply with BS EN 61400-1; 2005 'Wind Turbines. Design requirements'.

A construction Health and Safety Plan will be developed to manage safety during construction. This will help ensure that health and safety will be of the highest standard.

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EWT	Emergya Wind Technologies BV
	Engineering

Category:	Specification	Page 1 / 2
Doc code:	S-1005020	

Created by:	TY	Creation Date:	07-12-11
Checked by:	MS	Checked Date:	07-12-11
Approved by:	TY	Approved Date:	07-12-11

Title:

Specification

Sound power warranty levels DW52/54 500kW

Revision	Date	Author	Approved	Description of changes
02	14-03-12	AB	TY	Modifications based on new IEC measurements
01	09-12-11	AB	TY	correction
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

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Sound power levels

The warranted sound power levels are presented with reference to IEC 61400-11:2002.

V_{wind} at 10m height	**DW52**	**DW54**
5 m/s	96,5 dB(A)	97.0 dB(A)
6 m/s	97.5 dB(A)	98.0 dB(A)
7 m/s	98.5 dB(A)	99.0 dB(A)
8 m/s	99.5 dB(A)	100.0 dB(A)
9 m/s	100.3 dB(A)	100.5 dB(A)
10 m/s	100.5 dB(A)	100.5 dB(A)

Sound power level Lw in dB(A)

The warranted sound power levels are based on actual measurements executed by an independent noise measurement institute according to the preferred methods set out in IEC-61400-11.

Uncertainty levels are included in the warranted sound power levels.

At 5m/s a maximum tonal noise penalty of 2,5dB shall be considered according to ETSU-R-97 guidelines.

The measured third octave sound power levels are available upon request.

The values given in the table are valid for normal operational mode (rotation speed 0-24 RPM)

The calculation of the standardized wind speed at 10m height according to IEC 61400-11 is based on a terrain roughness length Z_0=0,05m.

In case validation measurements have to be performed, they should be executed according to the preferred methods set out in IEC-61400-11 by an independent measurement institute which is accredited to ISO/IEC 17025 to conduct measurements of wind turbine noise emissions.

EWT reserves the right to make modifications or adjust settings in order to comply with the warranted sound power levels.

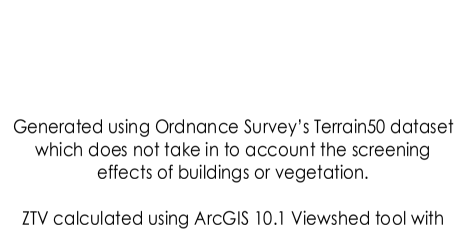
Netherton Wind Turbine

atmos CONSULTING

Figure 1
Cumulative ZTV - In planning - Netherton with East Drums

Key

- Netherton turbine (67m)
- Netherton 20km turbine buffer
- East Drums turbine (67m)
- East Drums 20km turbine buffer



Generated using Ordnance Survey's Terrain50 dataset which does not take in to account the screening effects of buildings or vegetation.

ZTV calculated using ArcGIS 10.1 Viewshed tool with observer eye height 2m above ground and corrections for earth curvature and atmospheric refraction applied.

Distance of ZTV calculations based on SNH guidelines

Up to 50m tip - 15km	51 to 70 m tip - 20 km
71 to 85 m tip - 25 km	86 to 100 m tip - 30 km
101 to 130 m tip - 35 km	131 to 150 m tip - 40 km

Above 150 m tip - 45 km

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0 2.5 5 10

Kilometres

N

Scale @ A3:
1:150,000

AC24

18/09/2014	TL01c	4611/ZV/015a
Drawn by: JM	Checked by: TH	Approved by: NT

APPENDIX 2

DEVELOPMENT MANAGEMENT REVIEW COMMITTEE

APPLICATION FOR REVIEW

FIELD 200M NORTH EAST OF BALNACAKE FARM, ALDBAR

APPLICATION NO 14/00281/FULL

APPLICANT'S SUBMISSION

ITEM 1	Notice of Review
ITEM 2	NPA01 – Scoping Opinion
ITEM 3	NPA02 – Planning Application 14/00281/FULL
ITEM 4	NPA03 – Correspondence re determination of the application
ITEM 5	NPA04 – 14/00281/FULL Netherton application consultation responses
ITEM 6	NPA05 – Response to CLO's comments
ITEM 7	NPA06 – Addition information sent to Council and response
ITEM 8	NPA07 – Response to EH0's request
ITEM 9	NPA08 – Decision letter and report of handling
ITEM 10	NDPP01-NDPP06 – Development plan and policy documents
ITEM 11	NLV01-NLV07 – Landscape and visual documents
ITEM 12	Figure 1 – Landscape character, setting and constraints
ITEM 13	Figure 2a and 2b – Visual sensitivity and residential amenity
ITEM 14	Figure 3 – Cumulative ZTV, East Drums and Netherton – overlay key receptors
ITEM 15	Figure 4 – Level of acceptable landscape character change
ITEM 16	Netherton Appeal Statement

NOTICE OF REVIEW

Under Section 43A(8) Of the Town and County Planning (SCOTLAND) ACT 1997 (As amended) In Respect of Decisions on Local Developments
The Town and Country Planning (Schemes of Delegation and Local Review Procedure) (SCOTLAND) Regulations 2013
The Town and Country Planning (Appeals) (SCOTLAND) Regulations 2013

IMPORTANT: Please read and follow the guidance notes provided when completing this form. Failure to supply all the relevant information could invalidate your notice of review.

PLEASE NOTE IT IS FASTER AND SIMPLER TO SUBMIT PLANNING APPLICATIONS ELECTRONICALLY VIA https://eplanning.scotland.gov.uk

1. Applicant's Details		2. Agent's Details (if any)	
Title		Ref No.	
Forename		Forename	
Surname		Surname	
Company Name	Polar Energy (Netherton) Ltd	Company Name	Atmos Consulting Ltd
Building No./Name		Building No./Name	Rosebery House
Address Line 1	West Cairnbeg Farmhouse	Address Line 1	9 Haymarket Terrace
Address Line 2	Laurencekirk	Address Line 2	
Town/City	Aberdeenshire	Town/City	Edinburgh
Postcode	AB30 1SR	Postcode	EH12 5EZ
Telephone		Telephone	01313469100
Mobile		Mobile	
Fax		Fax	
Email		Email	office@atmosconsulting.com

3. Application Details

Planning authority: Angus Council

Planning authority's application reference number: 14/00281/FULL

Site address:

Field 200m northeast of Balnacake Farm, Aldbar, Brechin

NGR 356161, 757678

Description of proposed development:

Erection of a single wind turbine of 40 meters to hub height and 67m to blade tip and ancillary development

Date of application | 18th April 2014 | Date of decision (if any) | 5th December 2014

Note. This notice must be served on the planning authority within three months of the date of decision notice or from the date of expiry of the period allowed for determining the application.

4. Nature of Application

Application for planning permission (including householder application)	☒
Application for planning permission in principle	☐
Further application (including development that has not yet commenced and where a time limit has been imposed; renewal of planning permission and/or modification, variation or removal of a planning condition)	☐
Application for approval of matters specified in conditions	☐

5. Reasons for seeking review

Refusal of application by appointed officer	☒
Failure by appointed officer to determine the application within the period allowed for determination of the application	☐
Conditions imposed on consent by appointed officer	☐

6. Review procedure

The Local Review Body will decide on the procedure to be used to determine your review and may at any time during the review process require that further information or representations be made to enable them to determine the review. Further information may be required by one or a combination of procedures, such as: written submissions; the holding of one or more hearing sessions and/or inspecting the land which is the subject of the review case.

Please indicate what procedure (or combination of procedures) you think is most appropriate for the handling of your review. You may tick more than one box if you wish the review to be conducted by a combination of procedures.

Further written submissions	☒
One or more hearing sessions	☐
Site inspection	☒
Assessment of review documents only, with no further procedure	☐

If you have marked either of the first 2 options, please explain here which of the matters (as set out in your statement below) you believe ought to be subject of that procedure, and why you consider further submissions or a hearing necessary.

The subject of any additional written submissions should be Landscape and Visual Impact Assessment (LVIA). Further submissions may be necessary to address any further issues raised by the council relating to LVIA.

7. Site inspection

In the event that the Local Review Body decides to inspect the review site, in your opinion:

Can the site be viewed entirely from public land?	☒
Is it possible for the site to be accessed safely, and without barriers to entry?	☒

If there are reasons why you think the Local Review Body would be unable to undertake an unaccompanied site inspection, please explain here:

8. Statement

You must state, in full, why you are seeking a review on your application. Your statement must set out all matters you consider require to be taken into account in determining your review. Note: you may not have a further opportunity to add to your statement of review at a later date. It is therefore essential that you submit with your notice of review, all necessary information and evidence that you rely on and wish the Local Review Body to consider as part of your review.

If the Local Review Body issues a notice requesting further information from any other person or body, you will have a period of 14 days in which to comment on any additional matter which has been raised by that person or body.

State here the reasons for your notice of review and all matters you wish to raise. If necessary, this can be continued or provided in full in a separate document. You may also submit additional documentation with this form.

This Notice of Review is submitted by Polar Energy (Netherton) Ltd, West Cairnbeg Farmhouse, Laurencekirk, Aberdeenshire, AB30 1SR. It relates to planning application reference 14/00281/FULL validated on the 18th of April for the erection of a single wind turbine of 40m to hub height and 67m to blade tip and ancillary development, situated on a field 200m northeast of Balnacake Farm, Aldbar, Brechin. This application was refused on 5th December 2014 and this notice of review has been prepared for submission to the Local Review Body.
The Netherton turbine planning application, 14/00281/FULL, which was due to be determined initially by Angus Council by 17 June 2014 was eventually refused on 5 December 2014 for the following reason: That the proposed turbine by virtue of its height and location close to the top of the escarpment which separates the Low Moorland Hills and the Broad Valley Lowland would result in unacceptable landscape and visual impacts and as such the proposal is contrary to policies ER5, ER34 and S6 of the Angus Local Plan Review (2009).
We however do not agree with the decision and this notice of review sets out our reasons for requiring a review.
A statement has been provided as a separate document with further details on the reasons for the notice of review. The application has been assessed against local plan review policies S6, ER5, ER34 and ER35 and it is demonstrated that the proposal clearly complies with the various assessment criteria set in the policies.

Have you raised any matters which were not before the appointed officer at the time your application was determined? Yes ☒ No ☐

If yes, please explain below a) why your are raising new material b) why it was not raised with the appointed officer before your application was determined and c) why you believe it should now be considered with your review.

The new material being raised are figures which are based on information contained in the relevant development plans and landscape capacity study giving a visual representation of the proposed turbine in relation to constraints.

9. List of Documents and Evidence

Please provide a list of all supporting documents, materials and evidence which you wish to submit with your notice of review

NPA01-Scoping opinion,NPA02-Planning application 14/00281/FULL,NPA03 Correspondence re determination of the application, NPA04 14/00281/FULL Netherton application consultation responses NPA05 Response to CLO's comments,NPA06 Additional Information sent to council and response NPA07 Response to EHO's request, NPA08 Decision letter and report of handling/ NDPP01 to NDPP06-Development plan and policy documents/NLV01 to NLV07- Landscape and Visual Documents Figure 1 – Landscape Character, Setting and Constraints, Figure 2a and 2b Visual Sensitivity and Residential Amenity, Figure 3 – Cumulative ZTV, East Drums and Netherton- overlay key receptors, Figure 4 - Levels of Acceptable Landscape Character Change

Netherton Appeal Statement

Note. The planning authority will make a copy of the notice of review, the review documents and any notice of the procedure of the review available for inspection at an office of the planning authority until such time as the review is determined. It may also be available on the planning authority website.

10. Checklist

Please mark the appropriate boxes to confirm that you have provided all supporting documents and evidence relevant to your review:

Full completion of all parts of this form ☒

Statement of your reasons for requesting a review ☒

All documents, materials and evidence which you intend to rely on (e.g. plans and drawings or other documents) which are now the subject of this review. ☒

Note. Where the review relates to a further application e.g. renewal of planning permission or modification, variation or removal of a planning condition or where it relates to an application for approval of matters specified in conditions, it is advisable to provide the application reference number, approved plans and decision notice from that earlier consent.

DECLARATION

I, the applicant/agent hereby serve notice on the planning authority to review the application as set out on this form and in the supporting documents. I hereby confirm that the information given in this form is true and accurate to the best of my knowledge.

Signature: [redacted] Name: Adenike Thompson Date: 11/12/2014

Any personal data that you have been asked to provide on this form will be held and processed in accordance with the requirements of the 1998 Data Protection Act.

ITEM 2

Nike Thompson

From: [redacted]
Sent: Tuesday, October 01, 2013 3:38 PM
To: Tony Gallagher
Subject: Screening Opinion for 13/00730/EIASCR - Field 200m North East of Balnacake Farm, Aldbar, Brechin
Attachments: FIELD 200M NORTH EAST OF BALNACAKE FARM SCREENING OPINION.DOC

Mr Gallagher,

I refer to the above screening option request and apologies for the delay in sending this to you. I am of the view that an EIA is not required in this instance.

I have not received any detailed comments form the Countryside Officer in relation to viewpoints selection, however I would comment that from looking at the plan it appears that the proposed turbine would be located on elevated ground and this will make it more visible in the landscape. In terms of other viewpoints to consider I would suggest a viewpoint from the B9134 road given its close proximity to it and also from Aberlemno. I would also suggest an assessment of all housing with 2km be undertaken and this may lead to additional viewpoints from housing most affected.

I trust this answers your queries. However please do not hesitate to contact me should you wish to discuss.

Regards

James Wright, Planning Officer (Development Standards), Planning & Transport Division, Communities, Angus Council, County Buildings, Market Street, FORFAR, DD8 3LG. Tel: 01307 473244

THE TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2011

SCREENING OPINION

ERECTION OF A SINGLE WIND TURBINE (67M TO BLADE TIP) AT FIELD 200M NORTH EAST OF BALNACAKE FARM

Angus Council has considered the type of development proposed; its nature, scale, location and impact on the environment. Account has also been taken of the criteria outlined in Circular 3/2011: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011. Schedule 2 of the 2011 Regulations states that the likelihood of significant effects will generally depend upon the scale of the development, and its visual impact, as well as potential noise impacts. EIA may be required for developments of two or more turbines, or where the hub height of a turbine exceeds 15 metres.

In this case the proposal is for a single wind turbine and from the information provided it would have a height to hub of 40m (67 to blade tip) to produce approximately 500kw of new generating capacity.

The Regulations and supplementary guidance indicate that EIA should only be required where it is judged that a development is likely to have significant environmental effects. In screening the proposal regard has been had to the location and characteristics of the development and the potential impacts as required by Schedule 3 of the Regulations. The screening opinion follows the flow chart for establishing whether a proposed development requires EIA found within Planning Circular 3/2011. In this instance I am satisfied that the proposal will not lead to significant environmental effects in terms of the EIA Regulations*.

(*The recipient should be aware that this view is taken for the purposes of screening the application in terms of EIA regulations only and should not be interpreted as indication that the environmental impacts of the proposed development are not significant in terms of any subsequent assessment of a planning application under the Section 37(2) of the Town and Country Planning (Scotland) Act 1997 as amended.)

My reasons for this conclusion that an EIA is not required are summarised below. From the information provided and a brief desktop study of the area I consider that this is not an EIA development for the following reasons: -

- The development does not give rise to any unusually complex or potentially hazardous environmental effects; and

- The likely impacts are localised and from the initial information provided do not appear to affect any particularly environmentally sensitive or vulnerable locations in the immediate area.

Accordingly, in terms of Regulation 6(4) of the 2011 Regulations my Council is of the opinion that the proposal does not constitute Environmental Impact Assessment development and will not require the submission of a full Environmental Statement as required by regulation 2(1) and Schedule 4 of the Regulations.

Netherton Wind Turbine

Environmental Appraisal

April 2014

Polar Energy (Netherton) Ltd

atmos CONSULTING

ITEM 3

Environmental Appraisal

Netherton Wind Turbine Project

Polar Energy (Netherton) Ltd

April 2014

Contents

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Figures

Document Prepared For
Polar Energy (Netherton) Ltd

Document Prepared By
Atmos Consulting Ltd.

Document Approved By
Atmos Consulting Ltd.

Version	Date	Reason
Final	April 2014	Submission to Angus Council

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Keystone Innovation Centre
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IP24 1JD

1 Introduction

1.1 The Application

This document has been prepared by Atmos Consulting Ltd. (Atmos) for Polar Energy (Netherton) Ltd. to support a planning application to Angus Council under the Town and Country Planning (Scotland) Act 1997. The application is for the development of a single wind turbine at Netherton 4.5km to the west of Brechin in Angus.

The application seeks consent for the installation of one wind turbine with a generating capacity of up to 500kilowatts (kW) and associated ancillary development. The maximum base to blade tip height of the turbine is 67m when the blades reach their highest point. The height of the tower would be around 40m with a rotor diameter of up to 54m. Ancillary development would include access track, external electrical housing, underground electricity cabling and temporary construction area. Figure 1-1 provides details of the site layout.

1.2 Site Description

The proposed development site is located on part of Balnacake farm on land which is currently used for agriculture. The site lies approximately 6km southwest of Brechin and approximately 12km northeast of Forfar. Figure 1-2 shows the site location.

There are no properties located within 400m of the proposed turbine location. The closest property is the financially involved Balnacake residential property approximately 450m southwest of the proposed turbine location. The closest non-residential property is a derelict building opposite Broomknowe Cottages approximately 570m northeast of the proposed turbine location.

River South Esk Special Area of Conservation (SAC) flows approximately 780m north of the proposed turbine location. There are no other designated areas for natural heritage within 5km of the site. The closest SSSI to the site is the Montrose Basin SPA/SSSI/Ramsar approximately 10km to the east of the site designated for its non-breeding bird assemblage.

1.3 The Applicant

The Applicant is Polar Energy (Netherton) Ltd.

1.4 Purpose of the Supporting Statement

This document has been produced to support the planning application in providing more details on the site and the results of the various assessments which have been undertaken as part of the design of the project.

It has been produced by Atmos; a specialist environmental, technical and planning consultancy with experience in the consenting over 500MW of wind energy developments.

Enquiries regarding this document should be made to:

Atmos Consulting Ltd.

Rosebery House

9 Haymarket Terrace

Edinburgh

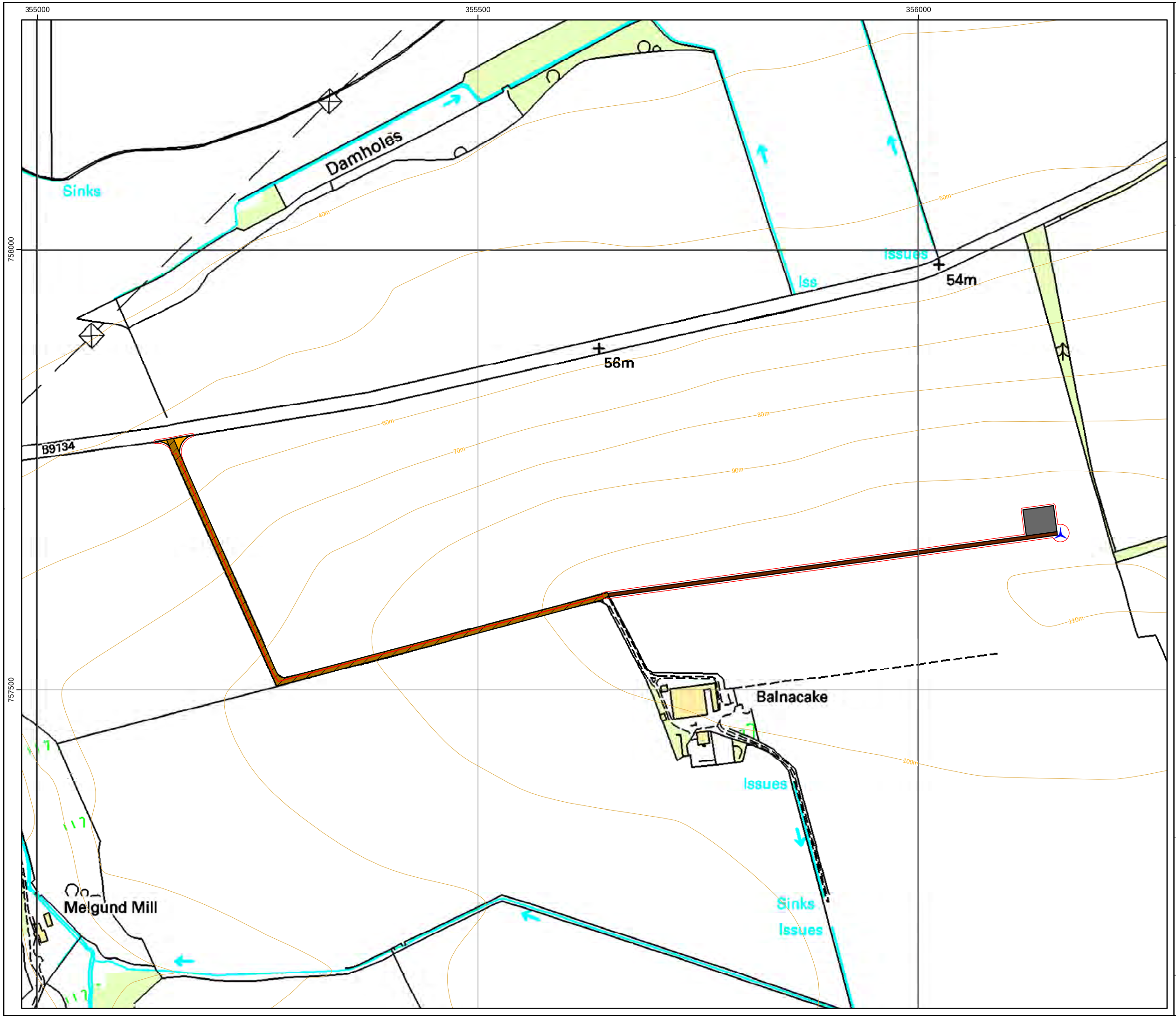
EH12 5EZ

Tel. 0131 346 9100

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-1
Site Layout / Application Boundary



Key

- Planning application boundary
- Turbine location - 356161, 757678
- Bellmouth
- Crane hardstanding / assembly area
- Existing onsite access track
- New onsite access track

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0 50 100 200
Metres

N

Scale @ A3:
1:4,000

20/02/2014 TL01c 4611/SL/003a
Drawn by: AA Checked by: TH Approved by: NT

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 1-2
Site Location

Key

Site boundary

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0 0.25 0.5 1
Kilometres

N

Scale @ A3:
1:25,000

20/02/2014 4611/SL/004a

Drawn by: AA Checked by: TH Approved by: NT

2 Project Description

2.1 Introduction

This section provides further information on the components of the proposed development and the construction, operation and decommissioning of the wind turbine. The main physical components of the scheme are:

- Single 500kW wind turbine
- External electrical housing unit (2m x 2m x 2.5m high)
- Underground cable connection
- Access track, upgrade and new section; and
- Crane hardstanding/Assembly area.

The total area for the planning application is 0.6387 hectares (ha).

2.2 Wind Turbine

It is proposed to install a single 500kW wind turbine generator at NGR 356161, 757678 which consists of a conical tubular steel tower, nacelle which contains the generator and associated equipment which are attached to a hub and rotor assembly including three glass/carbon fibre-reinforced polyester blades. An example of a typical turbine model similar to that which is proposed is shown in Figure 2-1.

The final choice of turbine will be subject to a competitive selection process based on the turbine models available at the time of construction. Notwithstanding this the maximum tip height will not exceed 67m.

Wind turbines are typically of variable speed type so that the rotor speed varies according to the energy available in the wind. Typically turbines are capable of generating power for wind speed between 3 and 25 metres per second (m/s). At wind speeds of over 25m/s the turbine will automatically shut down.

2.3 Ancillary Works

2.3.1 Wind Turbine Foundations

A buried reinforced concrete foundation would be constructed for the wind turbine. Detailed design for the foundation would be undertaken following geo-technical investigation. Generally a gravity foundation is used which for this size of turbine would consist of around 180m^3 of concrete poured in an excavation 2m to 3m deep. Subsoil and topsoil would be replaced on top of the foundation allowing the land around the tower to return to grass, except for the access track itself.

2.3.2 External Electrical Housing Unit

A small external electrical housing unit may be required adjacent to the wind turbine. This would house the electrical switchgear, electrical transformer, metering equipment and control system equipment. A prefabricated structure is proposed, approximately 2m x 2m x 2.5m high, on a concrete slab foundation. The installation would be in accordance with current regulations and practices including the Electricity Safety, Quality and Continuity Regulations 2002. Depending on final turbine selection, the electrical gear may be housed within the turbine whereby no external housing will be required.

2.3.3 Access track

A section of new access track is required to facilitate the delivery of the turbine components and pre-fabricated electrical housing. This track will be retained for the lifetime of the project to allow access for maintenance vehicles. The proposed track has a running width of 4m with the new section extending to approximately 480m beyond the existing length of track.

2.3.4 Crane Hard-Standing

A further area of hardstanding is required adjacent to the wind turbine position to provide a stable surface for the main-lift crane and tail crane during installation.

2.3.5 Parking

No parking facilities are required for this development as there will be no permanent staff associated with the project. Once the turbine is fully commissioned, maintenance traffic will make use of the hardstanding area when visiting the site.

2.3.6 Electrical connection

The wind turbine would be connected to the existing electricity grid via an underground cable laid adjacent to the track.

2.3.7 Micro-siting

It is normal practise to allow a small margin for adjustment of the wind turbine and equipment positions to accommodate any unusual ground conditions encountered during excavations. We would therefore request a 15m micro-siting allowance.

2.4 The Construction Process

The start date for the construction programme will depend on a number of factors including the outcome of the planning process, procurement of components and availability of contractors. It is anticipated that on-site construction would take up to three months and could be undertaken in three main phases:

1. Ground Works
   a. Construct access tracks
   b. Trench and lay cables
   c. Excavate and pour concrete turbine foundation
2. Wind Turbine Installation
   a. Deliver large components
   b. Employ cranes
   c. Erect wind turbine
3. Commissioning
   a. Electrical connections

b. Commissioning (checking and setting in operation)
c. Site reinstatement

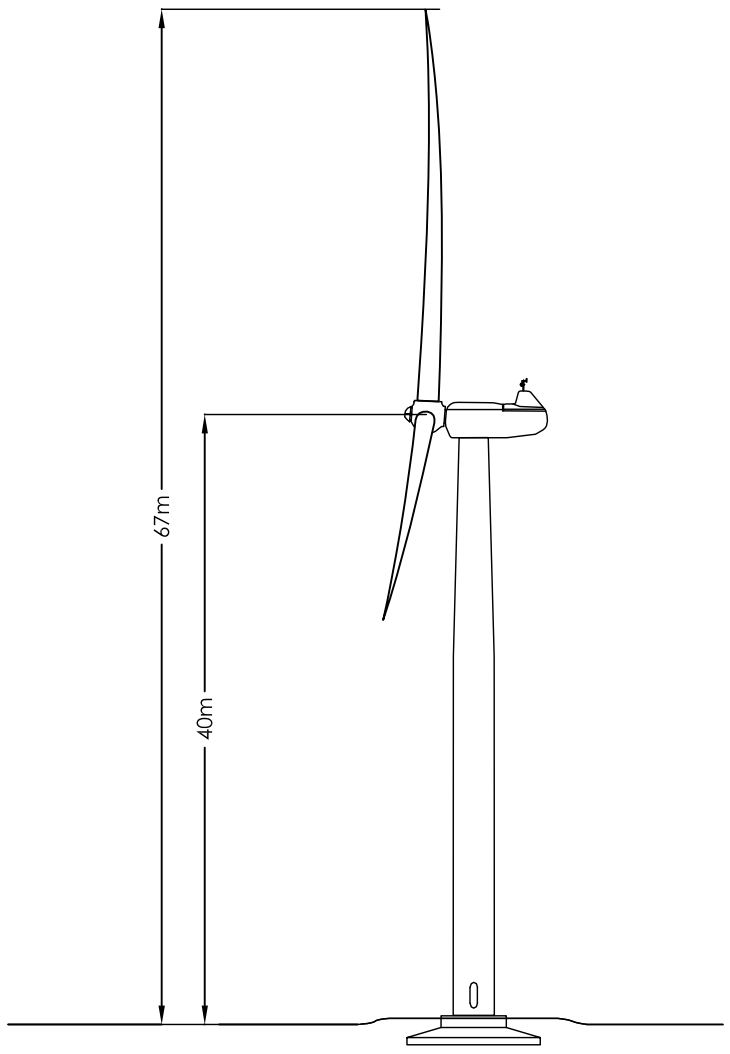
Excavated material would be reused on the site. Concrete for the foundations will be imported ready mixed from a suitable nearby quarry.

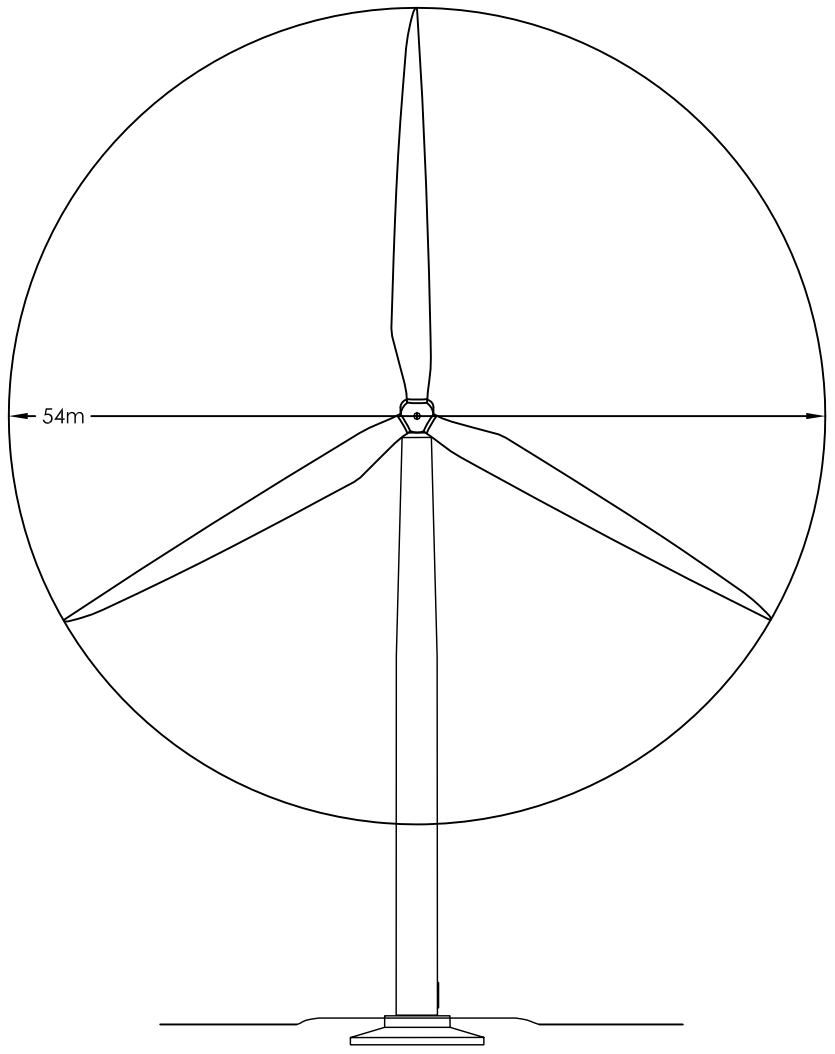
2.5 Working Times

The proposed normal working times of the construction activities are 08h00 to 18h00 Monday to Friday and 08h00 to 13h00 Saturday. During the installation of the wind turbine there may be a requirement to extend the working hours to take advantage of suitable weather conditions as some critical elements of installation cannot be stopped once started.

2.6 Decommissioning

Wind turbines have a normal service life of approximately 20-25 years. At the end of this period, the turbine would be decommissioned and the land put back to agricultural use. The above ground equipment would be removed from site. Unless otherwise agreed, the upper section of the concrete foundations would be removed to a depth of 0.5m. Underground cables would be left in place.





Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 2-1
Typical turbine dimensions

Notes:
Approximate ground level of wind turbine is 100mAOD.

atmos CONSULTING

0 5 15 30
Metres

Scale @ A3:
1: 500

19/02/2014 4611_CS_C001a
Drawn by: TG Checked by: TG Approved by: NK

3 Planning and Climate Change

3.1 Scottish Planning Context

The Climate Change (Scotland) Act 2009 creates a legislative framework to pursue a reduction in emissions associated with the unsustainable use of fossil fuels. The Government's headline targets are to generate the equivalent of 100% of Scotland's gross annual electricity consumption and the equivalent of 11% of Scotland's heat demand from renewable sources by 2020.

National Planning Policy is set out in Scottish Planning Policy (SPP) published in February 2010. Paragraph 187 states that planning authorities should support the development of wind farms in locations where the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed.

3.2 Angus Development Plan

The proposed Netherton wind turbine is situated within Angus and the development plan for the area consists of the Angus Local Plan Review adopted in 2009 and the TAYplan-Strategic Development Plan approved 2012. In considering any application at the Netherton site, the adopted Development Plan will form the main statutory instrument under planning legislation however the supplementary guidance will be a material consideration in planning providing that it generally accords with national policy.

3.2.1 Key Development Plan Policies

The Tayplan, approved in June 2012, includes Policy 6: Energy and Waste/Resource Management Infrastructure. Policy 6 relates to the aim of delivering a low/zero carbon future for the city region to contribute to meeting Scottish Government energy targets and indicates that, in determining proposals for energy development, consideration should be given to the effect on off-site properties, the sensitivity of landscapes and cumulative impacts. Tayplan Policy 6 does not add any new assessment criteria to the existing Angus Local Plan Review policies.

The Angus Local Plan Review dates from 2009 and was prepared in the context of SPP6 and is more up to date than the Structure Plan, though its adoption predates SPP. The key Local Plan policies are 'Policy ER34 Renewable Energy Developments' and 'Policy ER35 Wind Energy Developments'.

'Local Plan Policy ER34' sets out that proposals for all forms of renewable energy development will be supported in principle and will be assessed against a number of criteria.

'Local Plan Policy ER35' sets out that wind energy proposals must meet the requirements of Policy ER34 above and must also demonstrate that a number of criteria are met.

Other development plan policies will be relevant to the determination of the planning application on a subject by subject basis.

3.2.2 Local Plan

Policy ER34 and ER35 in the Angus Council local plan are the starting point for the consideration of wind energy proposals in Angus. The aims of these policies are to encourage the sensitive development of renewable energy facilities. Proposals for all forms of renewable energy developments will be supported in principle and will be assessed against the following criteria as stated in Policy ER34:

1) the siting and appearance of apparatus have been chosen to minimise the impact on amenity, while respecting operational efficiency;

2) there will be no unacceptable adverse landscape and visual impacts having a regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints;

3) that the development will have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons;

4) no unacceptable environmental effects of transmission lines, within and beyond the site;

5) access for construction and maintenance traffic can be achieved without compromising road safety or causing unacceptable permanent change to the environment and landscape; and

6) that there will be no unacceptable impacts on the quality of groundwater or surface water resources during construction, operation and decommissioning of the energy plant.

Wind energy developments must meet the requirements of Policy ER34 and also demonstrate the following:

1) the reasons for site selection;

2) that no wind turbines will cause unacceptable interference to birds, especially those that have statutory protection and are susceptible to disturbance, displacement or collision;

3) there is no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light;

4) that no wind turbines will interfere with authorised aircraft activity;

5) that no electromagnetic disturbance is likely to be caused by the proposal to any existing transmitting or receiving system, or (where such disturbances may be caused) that measures will be taken to minimise or remedy any such interference;

6) that the proposal must be capable of co-existing with other existing or permitted wind energy developments in terms of cumulative impact particularly on visual amenity and landscape, including impacts from development in neighbouring local authority areas;

7) a realistic means of achieving the removal of any apparatus when redundant and the restoration of the site are proposed.

3.2.3 Supplementary Planning Guidance

Angus Council approved, as supplementary guidance, the 'Angus Wind Farms - Landscape Capacity and Cumulative Impacts Study' in September 2008 for use in the assessment of wind farm applications and to provide advice on the cumulative effects of existing and potential future wind farm developments in Angus. This document was produced in response to a number of planning applications and a conjoined planning inquiry but was subsequently adopted by the Council for wider use. The study examines the various landscape types in Angus and provides a comment on landscape capacity within these areas. The document is not part of the development plan and, therefore, is of limited weight for development management purposes.

The SPG identifies the area of the site as being within one of the identified Lowland Areas (12 Low Moorland Hills) where the scale and type of landscape suggests that careful siting of windfarms of a medium to small scale only. The Lowland Low Moorland Hills landscape type though clearly higher than the Lower Esk Valleys and Montrose Basin area, are of lower elevation than the adjacent Dislope Farmland area. Most of the Lowland Area is classified as having low sensitivity however within the wider area, there are locally important examples of higher natural heritage sensitivity such as small-scale landscapes, skylines and habitats that will influence the location of wind turbines.

The Implementation Guide for Renewable Energy was approved by the Council in June 2012. In terms of its status, the 'Implementation Guide' does not form part of the Development Plan, but is a material planning consideration for the determination of planning applications. Its provisions should be considered alongside other material considerations, which include national planning and energy policy and the various benefits of the proposal as described in the application package. The guidance offers more detailed information and clarification of the main factors in determining renewable energy proposals, an application checklist and guidance on landscape and visual assessment issues and noise assessments. The Implementation Guide identifies the area as having scope for turbines circa 80m in height which do not disrupt the principle ridgelines or adversely affect the setting of important landscape features monuments such as Balmashanner Monument and Finavon and Turin hillforts.

The Strategic Landscape Capacity Assessment for wind energy in Angus by Ironside Farrar was adopted in November 2013. In terms of its status, this document does not form part of the development plan but is a material consideration for the determination of planning applications. The study identifies the Montreathmont Hills sub area as having low capacity for 50m-80m turbines.

4 Noise

4.1 Assessment Methodology

The assessment of operational noise is carried out in accordance with ETSU-R-97, *'The Assessment and Rating of Noise from Wind Farms'* (hereafter referred to as ETSU) and in line with best practice given in the IOA *'Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise'* (hereafter referred to as the IOA Good Practice Guide (GPG).

'Onshore Wind Turbines', which replaces parts of PAN45 (Scottish Executive, 2002) provides specific advice on noise from wind farms. Specifically, the document states:

"…The Institute of Acoustics (IOA) has since published Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise. The document provides significant support on technical issues to all users of the ETSU-R-97 method for rating and assessing wind turbine noise, and should be used by all IOA members and those undertaking assessments to ETSU-R-97. The Scottish Government accepts that the guide represents current industry good practice."

ETSU sets out a method of assessing the operational noise levels from a wind farm and calculating appropriate evolution criteria. In accordance with the ETSU method, the assessment of noise follows these stages:

- Identification of the nearest Noise Sensitive Receptors (NSRs);
- A screening exercise to identify any properties where expected levels of wind turbine noise may exceed 35dB(A) for wind speeds up to 10m/s at 10m height, to determine if background noise monitoring is necessary;
- Where required, a background noise survey at receptor locations in parallel with wind speed monitoring on the site;
- Generation of a background noise curve from the measured data, characterising the noise levels as a function of wind speed;
- Generation of agreed noise limits for each NSR;
- Prediction of received noise levels at NSRs (immission levels), by means of a noise model, across a range of wind speeds;
- Comparison of predicted levels with agreed noise limits;
- Assessment of any cumulative effects; and
- Identification of mitigation in terms of layout and attenuation if necessary.

NSRs are properties which are sensitive to noise and, therefore, require protection from nearby noise sources. A number of NSRs have been identified surrounding the proposed development, all of which are residential properties. Consequently, noise immission levels throughout the assessment are predicted, where appropriate, to the closest garden boundary, rather than the façade of the property. This is to ensure the continued protection of existing amenity of residential outdoor areas.

The closest NSR assessment locations to the proposed development are detailed in Table 4-1 and shown on Figure 4-1.

Table 4-1: Nearest Identified Noise Sensitive Receptors (NSRs)

NSR Name	NSR ID	Approximate OS Grid Co-ordinates	
		x	y
Broomknowe	NSR01	356347	758319
Broomknowe Cottages	NSR02	356422	758163
Muiryloan House	NSR03	356716	758294
Walkend Cottage	NSR04	356862	757656
Mains of Aldbar	NSR05	357114	757728
Sparmuir	NSR06	357180	757466
White Myre	NSR07	357151	756994
House View House	NSR08	356593	757030
Wandershiell	NSR09	356380	757125
Balnacake	NSR10	355787	757443
Bibberhill	NSR11	355363	756929
Melgund Mill	NSR12	355028	757230
Netherton	NSR13	354840.	757690
Colinshaugh	NSR14	355016	758471

The ETSU screening exercise is carried out in order to identify any properties where the noise immission levels may exceed 35dB LA90. To this end, a noise propagation model is run, which assumes the turbine is operating at maximum sound power output. The model defines a 35dB LA90 noise contour surrounding the proposed development. Any properties located within and on the edge of this contour are then identified as the nearest NSRs which require a 'full' ETSU assessment to be undertaken. This assessment requires baseline noise level monitoring, the results of which are used to derive the noise level limits for each NSR. However, where no NSRs are identified within the noise contour, no further assessment is required.

This is detailed in ETSU as follows:

"We are of the opinion that if the noise is limited to an LA90,10min of 35dB up to wind speeds of 10m/s at 10m height, then this condition alone would offer sufficient protection of amenity, and background noise surveys would be unnecessary. We feel that, even in sheltered areas when the wind speed exceed 10m/s on the wind farm site, some additional background noise will be generated which will increase the noise level at the property. This type of condition may be suitable for single turbines or wind farms with large separation distances between turbines and the nearest properties."

4.2 Turbine Data

A-weighted warranted broadband sound power level data for the proposed turbine has been obtained from the turbine manufacturer for the EWT DW54-500kW turbine model. This is the developer's preferred turbine type and is representative of a typical turbine in the class proposed for the development. The EWT broadband data is provided in Appendix 4-1.

The octave band data for the EWT DW54-500kW turbine is not warranted, but has been standardised to the warranted broadband sound power levels supplied by the manufacturer. Uncertainty has been accounted for within the manufacturer's warranted broadband levels.

The standardised octave band sound power level data used within the noise model is detailed in Table 4-2. This represents the turbine operating at maximum noise level output, which occurs at wind speeds of 9 and 10m/s.

The octave band data at 10m/s gives an overall warranted broadband sound power level of 100.5dB(A) when logarithmically 'summed' together.

Table 4-2: Standardised octave band sound power level data for EWT DW54-500kW at maximum noise output, SWL dB(A)

63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	Overall*
82.7	88.8	94.1	95.4	94.0	91.5	84.6	72.8	100.5
*logarithmic sum of octave band data, corresponding to the warranted broadband level published by the manufacturer for a wind speed of 10m/s (maximum noise output).								

Based on this data, noise propagation calculations are undertaken in accordance with ISO9613-2, *'Acoustics – Attenuation of Sound during Propagation Outdoors'* (ISO, 1996), using the propriety software model CadnaA. The model uses the following input parameters:

- Temperature is assumed to be 10°C and relative humidity as 70%;
- A ground attenuation factor of 0.5 is assumed. This is in accordance with the IOA GPG which recommends a ground factor of 0.5 be used for all turbines with warranted sound power levels;
- All NSR heights are set to 4m; and
- No barrier attenuation is included, i.e. attenuation attributable to the effects of local topography or manmade structures is not included within the calculations.

4.3 Results

The calculated noise immission levels are detailed in Table 4-3.

The propagation model provides for the prediction of sound pressure levels based on downwind (i.e. worst case) conditions and other conditions favourable for noise propagation. When the wind is blowing in the opposite direction, noise levels will be significantly lower; therefore, the noise propagation model is inherently conservative.

Table 4-3: Calculated Predicted Noise Immission Levels (dB LA90) at NSRs

NSR Name	NSR ID	Predicted LA90 dB
Broomknowe	NSR01	29
Broomknowe Cottages	NSR02	31
Muiryloan House	NSR03	26
Walkend Cottage	NSR04	28
Mains of Aldbar	NSR05	25
Sparmuir	NSR06	24
White Myre	NSR07	22
House View House	NSR08	27
Wandershiell	NSR09	30
Balnacake	NSR10	33
Bibberhill	NSR11	23
Melgund Mill	NSR12	22
Netherton	NSR13	21
Colinshaugh	NSR14	21

In addition to the ISO9613-2 noise propagation calculations presented above, the assessment also considers the effect of the intervening ground profile between the proposed turbine and the NSRs, as per the methodology within the IOA GPG.

The GPG states in paragraph 4.3.9:

"A further correction of +3dB should be added to the calculated overall A-weighted noise level for propagation 'across a valley', i.e. a concave ground profile, or where the ground falls away significantly, between the turbine and receiver location.

The following criterion of application is recommended:

$$h_m \geq 1.5 \times (abs\ (h_s - h_r) / 2)$$

Where h_m is the mean height above the ground of the direct line of sight from the receiver to the source, and h_s and h_r are the heights above local ground level of the source and receiver respectively."

Using topographic data at a resolution of 50m, along with the location of the turbine and the closest NSRs, it is found that a correction of +3dB is to be added to the predicted noise level at NSR01, NSR02, NSR03 and NSR14. No corrections at other NSRs are required. The corrected noise propagation calculations are shown in Table 4-4.

Table 4-4: Predicted Noise Immission Levels (dB LA90) at NSRs

NSR Name	NSR ID	Predicted LA90 dB
Broomknowe	NSR01	32*
Broomknowe Cottages	NSR02	34*
Muiryloan House	NSR03	29*
Walkend Cottage	NSR04	28
Mains of Aldbar	NSR05	25
Sparmuir	NSR06	24
White Myre	NSR07	22
House View House	NSR08	27
Wandershiell	NSR09	30
Balnacake	NSR10	33
Bibberhill	NSR11	23
Melgund Mill	NSR12	22
Netherton	NSR13	21
Colinshaugh	NSR14	24*
*Correction of +3dB added to the predicted noise levels for these NSRs.		

It can be seen from Table 4-4 that, at a maximum noise output, the noise immission levels from the proposed turbine do not exceed ETSU-R-97 'simplified' noise limit of 35dB LA90 at any of the identified NSRs.

4.4 Cumulative Assessment

There are no known wind turbine schemes, either operational, in planning or at a scoping stage, which could impact on the calculated noise immission levels at the identified NSRs. The effect of cumulative noise impacts has, therefore, not been considered within the assessment.

4.5 Summary

A noise assessment has been undertaken for the proposed wind turbine development, in accordance with ETSU-R-97. The assessment has demonstrated that the predicted noise immission levels do not exceed the ETSU-R-97 'simplified' noise limit of 35dB LA90 at any receptor. A 'full' ETSU-R-97 noise assessment is therefore not required.

The impact of noise from the proposed development is not considered to be significant and as a result, there will be no negative noise impacts associated with the operation of the turbine.

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 4-1
Noise Sensitive Receptors

Key

- Turbine location
- Noise Sensitive Receptor
  - NSR01 - Broomknowe
  - NSR02 - Broomknowe Cottages
  - NSR03 - Muiryloan House
  - NSR04 - Walkend Cottage
  - NSR05 - Mains of Aldbar
  - NSR06 - Sparmuir
  - NSR07 - White Myre
  - NSR08 - House View House
  - NSR09 - Wandershiell
  - NSR10 - Balnacake
  - NSR11 - Bibberhill
  - NSR12 - Melgund Mill
  - NSR13 - Netherton
  - NSR14 - Colinshaugh

atmos CONSULTING

0 100 200 400
Metres

N

Scale @ A3:
1:7,919.61

20/02/2014 TL01c 4611/NO/012a
Drawn by: AA Checked by: TH Approved by: EK

5 Landscape and Visual

5.1 Introduction

This chapter presents the Landscape and Visual Impact Assessment (LVIA) for the proposed wind turbine development at Netherton. The purpose of the assessment is to determine the significance of impact (or effect) of the proposed development on the landscape and visual resource of the area.

LVIA's are separate, although linked, procedures. Landscape effects relate to the direct physical changes to the fabric or individual elements of the landscape. They also relate to the potential indirect changes to the wider patterns of landuse, landcover and the arrangement of landscape features which determine the character of the landscape. Visual effects relate to the potential changes in views and perception of the proposed development on visual amenity.

5.1.1 The Proposed Development and the Basis for Assessment

The LVIA is based on the development of a single turbine up to the maximum tip height of 67m. This turbine would be located within the Montreathmont Forest and Moor area in Angus. It would be classified as a Medium/Large Turbine 50m to < 80m in height in line with Angus Councils, Strategic Landscape Capacity Assessment for Wind Energy (SLCA), November 2013. This is the fourth turbine size category out of six.

The proposal would also include a control building, an access track, underground cabling, crane pad and temporary construction and laydown area. The assessment of these associated elements is considered, where relevant, to the assessment of effects upon the landscape and visual resource.

5.2 Methodology and Approach

5.2.1 Scope Guidance

This appraisal has been completed in accordance with the Scottish Natural Heritage (SNH) guidance on the "Natural Heritage assessment of small scale wind energy projects which do not require formal Environmental Impact Assessment (EIA)", March 2008 in accordance with the screening response from Angus Council. The SNH guidance indicates that for turbines of over 50m in height, the following should be undertaken:

- Consultation with the planning authority over the scope of the assessment;
- Production of a Zone of Theoretical Visibility (ZTV) map;
- Visualisations and photomontages, focusing on key viewpoints;
- Assessment of sensitivity, magnitude of change and residual effects;
- Map of all wind turbine proposals in the public domain within the study area;
- Assessment of all applied, consented or constructed proposals within 30km of the application proposal

Data Sources and Guidance

The LVIA will follow relevant standards and guidance, principally set out in the Landscape Institute and Institute of Environmental Management & Assessment's (IEMA) Guidelines for Landscape and Visual Impact Assessment, third edition, published in 2013 (GLVIA). This edition emphasises the need for well argued proportionate narrative text to assess whether an effect is significant or not with tables and matrices to guide or support the judgement. The LVIA also draws upon other sources of information and guidelines. These are detailed in section 5.8.

5.2.2 Defining Baseline Sensitivity

GLVIA notes that the sensitivity landscape receptors should consider the susceptibility and value attached to the receptor. It describes this as "*the ability of the landscape receptor (whether it be overall character or condition of a particular landscape type or area, or an individual element and /or features, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation*".

The identification of sensitivity therefore needs to be considered in relation to the nature of the change, i.e. the type and scale of development proposed within a particular area or type of landscape and the association and tolerance of the identified landscape or individual contributing elements thereof, to that change. For landscape sensitivity this will include consideration of parameters such as the value placed on the landscape; the pattern, scale and complexity of elements; the consistency of the strength of character; the 'attractiveness' or scenic quality; its contribution to the wider landscape and its robustness, or the degree to which change can be absorbed (defined by, for example, its diversity or openness).

Visual sensitivity will be dependent upon "*the susceptibility (of different receptors) to change in views and visual amenity they experience at particular locations*". It includes a combination of parameters, including the activity / occupation / pastime of the receptors at particular locations which are "publically accessible"; the extent to which their attention or interest may therefore be focused on the "particular view" and the visual amenity they experience at particular locations. It will comprise the location, relative focus and orientation of views, the quality or importance of the existing view; the principal or secondary interest in that view and the ability of the view to accommodate the type of development and the frequency and duration of the view.

Landscape and visual sensitivity can be considered on a graduated scale from High, Medium or Low, or by a combination of categories. The categories are defined below. They are derived from GLVIA. However, it is important to note that the divisions between categories are not always clear cut and "*in reality there will be a graduation in the susceptibility to change*", (GLVIA 6.35) where some landscapes and/or views may exhibit characteristics that fall within more than one sensitivity level. On this matter GLVIA advises that each project should consider the nature of the landscape and groups of people who will be affected and for visual receptors "*the extent to which their attention is likely to be focused on views and visual amenity*". As such professional judgement is required when determining susceptibility/sensitivity of receptors and the rationale for assigning a specific sensitivity will be explained in the assessment

As an additional measure, the visual sensitivity of "private views" from residential properties will also be assessed. This is defined below and in more detail in the section

on residential amenity effects (5.7). As for the main LVIA it will define the susceptibility to change "*in particular views*". Although residents are recognised as being more susceptible and sensitive, the relative sensitivity will also depend on the nature of the receptor and the value, importance and interest placed on particular views, which contribute to the enjoyment of the property.

Table 5-1: Landscape/Visual Sensitivity

Sensitivity	Receptor	Definition
High	Landscape	Typically small scale, enclosed landscapes with complex landform and a mosaic of habitat and landcover where turbines would be out of scale. Irregular patterns of enclosure and traditional settlement pattern with a general absence of contemporary structures giving a sense of remoteness and wilderness. Well used recreational areas with extensive views within/into/out of area to distant horizons; Landscape of distinctive character with strong cultural associations
	Visual	Residents with principal/direct views, which are "private" views constantly available and contribute to the experience / enjoyment and value attached to a particular view from the house; Visitors to scenic viewpoints/ beauty spots or engaged in outdoor recreation with an interest focused on a particular view; Long distance footpath routes with prolonged viewing opportunities; Important and recognised views valued for attractiveness/ scenic quality and locations likely to attract high numbers of people with a primary interest in the view. Intact and unaffected by modern influences.
Medium	Landscape	Medium scale landscape with a combination of open and more enclosed landform. Contemporary structures/development are a feature either within/into/out of area. Rural working landscapes containing evidence of human activity with strong characteristics, relatively intact.
	Visual	Residents and visitors with secondary, distant views away from the principal focus of the house/curtilage and private view; Footpaths with fleeting/ transient/ peripheral views. Other tracks; roads used for tourism or journeys of a recreational nature, locations likely to attract moderate numbers of people. Contemporary structures/development are an element of views .Viewers with a moderate interest in their surroundings e.g. users of outdoor recreation areas
Low	Landscape	Large scale open/exposed landscapes with smooth regular flowing landform and limited variation in landcover in which turbines would not be out of scale. Contemporary structures such as pylons, masts and other infrastructure evident. Visually contained by landform or vegetation with limited views within/into/ out of area with near horizons. Limited cultural associations and little if any recreational or amenity function.
	Visual	Viewers with a passing interest in the view e.g. Views from industrial or commercial buildings or areas; roads used primarily for commercial travel and/or commuting; views from trains, locations likely to attract low numbers of people. visitors engaged in an occupation/pastime, rather than focused on the wider landscape

5.2.3 Defining Magnitude of Effect

Magnitude of change is defined within GLVIA as "a combination of the scale, extent and duration of an effect" and are categorised as High, Medium, Low or Negligible or as a combination of two categories to provide a more detailed, intermediate group i.e. High to Medium or Medium to High. Effects can be direct, where they involve a physical change to a defined element or characteristic of the landscape, or indirect, where effects are secondary and perceived on the wider pattern of elements or on visual amenity, away from the proposed site.

Criteria for defining the level of magnitude are identified below. Magnitude of Visual change is derived from guidance in the Visual Assessment of Wind Farms: Best Practice (University of Newcastle 2002). The magnitude will also be influenced by the spatial extent of the effect, the duration and the degree to which the effect is reversible.

Table 5-2: Magnitude of Effect

Magnitude	Receptor	Definition
High	Landscape	Very obvious or notable change in the balance of landscape characteristics; ranging to particularly intensive change (i.e. a dominating effect) over a more limited area. The proposal would be a prominent feature in the make-up of the character area
	Visual	DOMINANT: Major change to the make-up / balance of the view Commanding, controlling, striking, sharp, unmistakable easily seen.
Medium	Landscape	Whilst notable or obvious, the change would not fundamentally alter the balance of the landscape characteristics
	Visual	PROMINENT/CONSPICUOUS: Moderate changes in the nature of the view. Noticeably distinct, catching the eye or attention, clearly visible and well defined.
Low	Landscape	Very small change in the balance of overall characteristics, such that post development the change would be discernible but the underlying pattern of characteristics would remain similar to the baseline condition.
	Visual	APPARENT: Minor change in the nature of the view. Evident but lacking sharpness of definition, not obvious, indistinct, not clear, obscure, blurred indefinite. Discernible but the underlying nature of the view would remain similar to the baseline (limit of potential visual significance).
Negligible	Landscape	Change, which whilst occurring, would not influence the wider landscape character and/or would be barely discernible, perceptible or legible , approximating to a "no change" situation
	Visual	FAINT/SLIGHT: Very minor change to the view, weak, not legible, near limit of acuity of human eye. Change would be barely discernible, approximating to the "no change" situation.

The assessment will provide rationale for the criteria selected and will highlight any modifying factors, such as the potential for weather conditions to restrict views; the principle aspect of the landscape and visual receptor; the mobility or static nature of receptors, the proportion of any particular character/view affected, the potential for the development to attract the eye or to become a focal point in the view/landscape, to the detraction/benefit of competing visual elements and the presence/absence of other comparable features such as existing wind turbines.

5.2.4 Establishing Extent (and Significance) of Effect

Once the sensitivity and magnitude are classified, they are considered together to assess the extent of effect and its potential significance. This is done using the assessment in the matrix in Table 5.3 to guide the determination of significance. This assessment considers effects of Moderate and above to be significant in EIA terms.

Table 5-3: Extent of Landscape / Visual Effect

		SENSITIVITY (of the landscape or visual receptor)		
		Low	Medium	High
MAGNITUDE (of the anticipated effect upon the landscape / visual resource	High	Moderate	Moderate/Major	Major
	Medium	Minor/Moderate	Moderate	Moderate/Major
	Low	Minor	Minor/Moderate	Moderate
	Negligible	Negligible	Negligible	Negligible

The prediction and extent of effect cannot always be absolute. Paragraph 7.38 of GLVIA, states that "*Significance of effect is not absolute and can only be defined in relation to each development and its location. It is for each assessment to determine the assessment criteria and the significance thresholds, using informed and well-reasoned judgement supported by thorough justification for their selection, and explanation as to how the conclusions about significance for each effect assessed have been derived*". A conclusion that an effect is '*significant*' should not be taken to imply that the proposed development is unacceptable. Significance of effect needs to be considered with respect to the extent of a landscape or a view over which it is experienced

5.2.5 Consultation

The scope of assessment for the LVIA, including the study area radius, methodology and the proposed number and location of representative viewpoints which were established through liaison with Angus Council and subsequently agreed in October 2013.

5.3 Baseline Conditions

The proposed wind turbine lies within Strathmore area of Angus, to the southwest of Brechin. The host landscape is an area of open, sloping arable farmland and low moorland hills to the south side of the Strathmore valley. Whilst considerable areas exhibit a large, open character with notable areas of mixed farmland, moorland, coniferous forestry plantations and woodland, human influence is also evident, with a dispersed settlement pattern and notable built influences at various points, including power lines, pylons, communication masts and existing wind turbines at similar elevated points on the fringes of Strathmore.

5.3.1 The Landscape Fabric of the Site

The landscape fabric of the proposed site consists of open, gently sloping landform with the proposed turbine sited at approximately 110m AOD. Landform continues to rise and fall gradually at this height to the south. It then descends quickly to the north by around 1OOm to the River South Esk.

Land cover features are limited across the site. It is defined by large scale, open farmland with fields divided by post and wire fencing. Vegetated features are then limited across much of the development site which adds to the overall scale and simplicity of the landcover. However, to the east and the northeast some woodland shelter belts and woodland area are present. These, provide screening and shelter to residential properties to the northeast. The landscape fabric of the site is, considered to be of medium sensitivity to change on account of its simple scale, frequency, contrast and coverage of moderately valued elements.

5.3.2 Landscape Policy and Designation

Within the study area, a number of designated landscapes exist (Figure 5-1). However, there are no nationally important landscape designations within the study area.

While no local landscape designations exist within Angus, there are three 'principal geographical areas' defined. Local policy and the supporting Angus Windfarms Study, considers that the Highlands and Coast areas are the most sensitive to wind farm developments. The nearest section of the more sensitive areas lies at The Coast (4.5km to the east, with the Highland areas stretching from 7km to the northwest. The area around the site is then classified as a less sensitive Lowland and Hills area. These are indicated on Figure 5-1 and the baseline sensitivity to the type of change is summarised below in Table 5-4.

While there are further locally defined Areas of Landscape Significance (ALS) in Aberdeenshire at distances in excess of 15km and with a separate focus and orientation, there would be no notable visibility from these areas or potential for significant effect on views or the character and setting of these landscape and no further assessment is, therefore, necessary.

Also of note to the LVIA, a number of historic landscape features exist. In terms of the landscape setting (their visual and contextual relationship with their surroundings) there are two Conservation Areas (CA) within 5km, at Brechin and Brechin Castle at 4.5km to the northeast, where there could be potential for effect on the landscape setting. There is also one Garden and Design Landscape (GDL) connected with the Castle grounds.

These area lie at a relatively low point in the surrounding landscape with contained focus, backclothed by rising terrain to the southwest. Beyond 5km there is a further GDL at Kinnaird Park to the east between 5 and 8km. However, theoretically visibility is largely absent from this area and the potential for notable effect on views and the landscape setting would be limited given the combination of distance and scale of the intervening landscape. This is also the case for more distant CAs and GDLs beyond 7-8km. As a result no further assessment is considered, necessary. For detailed information on the historic landscape features refer to the Cultural Heritage Section (Section 8).

5.3.3 Landscape Character Resource

The character of the landscape context is defined within the SNH Review Tayside Landscape Character Assessment (LCA), SNH Review No.122, LUC, 1999. At 15km to the northeast the character is defined in the SNH Review No.102 South and Central Aberdeenshire LCA. These reports have provided a valuable benchmark for assessing landscape character. However, it should be noted that since publication, for some areas of the landscape, the baseline character is now very different. This is often as a result of (wind) energy developments and other infrastructure. Where the character has been modified in such cases, this has been noted within the assessment. This has also been recognised in with the SLCA, which provides further guidance on character and capacity.

Within the study area and of relevance to the proposed development, within key areas of the ZTV, two principal Landscape Character Types (LCTs) are present (Figure 5-2), with sub areas locally defined as landscape character areas (LCAs). They include the Low Moorland Hills LCT (Montreathmont Moor.) and the Broad Valley Lowland LCT (Strathmore).

At other points of distance and within the fringes of the principal zones of the ZTV, other LCTs are present within the Highland Foothills LCT lying between 7.5km and 10km to the north, the Lowland Loch Basin (Montrose Basin) at 4.5-17km to the east and the Dipslope Farmland defining the area at 7.5km to 20km to the south.

Low Moorland Hills LCT

The proposed turbine is located within the Low Moorland Hills LCT. This LCT extends to cover much of its surrounding context up to 5km to the east, 10km to the west and 7.5km to the south. However, further analysis of the LCT within Angus Council's SLCA, defines "*two clearly different subtypes: the lower, flatter and significantly afforested Montreathmont Forest and Moor and surrounding farmland to the east of Turin Hill and north of Guthrie and the area of widely separated steep sided Low Moorland Hills in rolling farmland to the west, surrounding the east and south sides of Forfar*".

The proposed turbine is located within sub landscape character area (LCA) ii) Montreathmont Moor. Here the character is defined as distinctly different in character from the Forfar Hills sub area. The SLCA notes that:

"*The landform is predominantly gently undulating and gradually slopes down to the lower Montrose Basin LCA to the east. There are no distinctive hill landforms, although the northern edge forms an escarpment of some 100m descending to the River South Esk. It is a medium to large scale farming and forestry landscape dominated by Montreathmont Forest which is a distinctively large mature lowland forest dominated by coniferous planting. It is well populated by scattered properties and farmhouses in the farmland areas outside the forest, with a network of small roads.*"

The summary of landscape capacity and sensitivity is defined in the SLCA. It notes that "parts of the Low Moorland Hills have capacity for small groups of larger turbines up to 80m" This includes the proposed site, which lies within a defined area (Figure A of SLCA) which has the highest underlying capacity in Angus for wind energy development. This stretches from the sites context to the south across area 3) Montreathmont Forest and farmland to the south of Brechin. The capacity study defines these areas as having "the capacity to accommodate larger sizes of turbine and/or greater numbers and concentrations relative to other areas of landscape in Angus"

The landscape sensitivity of this sub LCT to change is considered to be Medium in the SLCA, with the simple topography, medium to large scale rectilinear pattern and extensive commercial forestry making it an area of a Medium to Low Landscape Character sensitivity. Views within are often screened by mature coniferous forestry although the area is highly visible from higher ground within and surrounding it giving it a Medium Visual Sensitivity.

The Forfar Hills sub-type of the Low Moorland Hills LCT lies at around 5km to the west. It has a much more complex and "varied landscape of small steep hills and ridges set within a wider area of medium scale rolling/undulating farmland". This sub area also has "higher visual sensitivity and complex, modest scale landforms compared with the sub-area further to the east". The SLCA note that it is of medium-high landscape sensitivity to wind energy development.

Surrounding Landscape Character Types

Given the elevation of the proposed turbine, it would have some influence over the surrounding Broad Valley Lowland LCT (Strathmore) and its sub area at the Lower South Esk and North Esk Valleys. This LCA extends to cover much of the surrounding context to the north up to 7.5km and beyond 15km to the northeast and northwest. This sub LCA is similarly dominated by arable farmland but has two significant rivers, a greater level of tree cover and more topographic variation than the Strathmore LCA. The landscape sensitivity of this sub LCT to change is considered to be Medium in the SLCA. There is also a further sub area ii) which includes the corridor of the South Esk between Glen Clova and Brechin. It "encompasses the meandering course of the river which is a focus to the landscape. It is generally characterised by a degree of topographic enclosure; more shelter and enclosure by mature trees, a number of large houses and designed landscapes".

Beyond these LCTs (and sub LCAs), even with some intermittent visibility from fringe areas of the Highland Foothills LCT, the Lowland Loch Basin and the Dipslope Farmland, the general distance, orientation and separation from the proposed site, would reduce the degree of visibility. This would also lessen the potential for notable influence with the key characteristics of the area, with no significant effect on landscape character anticipated. As a result no further assessment of these LCTs is considered necessary. A summary of the sensitivity to change is recorded below for the principal LCTs.

Non Designated Natural Heritage Areas

The SNH Policy Statement No 02/ 02 'Strategic Locational Guidance for Onshore Wind Farms in respect of the Natural Heritage', has identified different areas of natural heritage sensitivity across Scotland. The proposed development site and much of its surrounding context lies in a zone defined as having the 'Lowest' Natural Heritage Sensitivity to Wind Turbines (Map 5 within the guidance). This zone represents the "*…areas at the broad scale with least sensitivity to wind farms, with the greatest opportunity for development, within which overall a large number of developments could be acceptable in natural heritage terms, so long as they are undertaken sensitively and with due regard to cumulative impact*". This does not necessarily imply the absence of natural heritage interest, but with good siting and design it should however enable such localised interests to be respected

Table 5-4: Landscape Baseline Conditions

Character Type (SNH Review Vol 122)	Distance min/max)	Sensitivity to change
Low Moorland Hills LCT (Montreatmont) Low Moorland Hills LCT (Forfar Hills)	0-10km	Medium Medium – High
Broad Valley Lowland LCT (Lower S&N Esk)	0-20km	Medium
Designated Landscape		
Principal geographical areas - Coast	4.5-20km+	High - Medium
Principal geographical areas - Highland;	7-20km+	High -Medium
Historic Landscape (landscape setting)		
Brechin CA	4.5km	High
Brechin Castle GDL and CA	4.5km	High

Application Site		
Landscape Fabric	0km	Medium

5.3.4 Visual Baseline Conditions

The purpose of the visual assessment is to identify from where and how it may be possible to see any part of the proposed development and to determine how this would affect the visual resource. The extent of visibility is firstly considered within the ZTV and then principally from a number of representative viewpoints that cover a broad range of sensitive viewpoints and represent both the different types of view and different types of viewer (ie visual receptors). Integral to this process is the need to define the sensitivity to change of the visual resource, which provides the baseline, against which the assessment of effects can be made.

Extent of Visibility

The computer generated ZTVs to hub height (40m) and blade tip height (67m) (Figures 5-3 to 5-4) identify areas of the landscape, from which the proposed wind turbine may theoretically be visible. This is in line with the Visual Representation of Windfarms, Good Practice Guidance (SNH). However it is important to note that ZTVs are tools for assessment and these are limited in several ways, including that, bare ground ZTVs make no allowance for any screening effects that may arise due to existing vegetation or built development (Figure 5-3). To limit this exaggerated impression, the significant areas of existing woodland have been modelled into the terrain model to provide a more realistic impression of anticipated visibility, using woodland areas identified on the 1:25k OS base (Figure 5-4). The real extent of the ZTV would also be influenced further, by the subtle variations of landform and landcover that are not covered by the digital terrain modelling data (DTM).

Key Visual Receptors

A range of visual receptors and receptor groups can be expected to be affected by the proposed development from both static and sequential points. These receptors will include, but not be limited to residents, travellers and those visiting the area for recreational, amenity and tourism purposes. The extent of the effect upon certain groups will then vary according to their level of sensitivity to the type of development. For ease of presentation the assessment identifies three key groups in line with the Angus Wind Farm Study: (1) local residents; (2) the travelling public; and (3) tourists /recreational visitors to the area. The baseline sensitivity of these groups is summarised in Table 5-1.

5.3.5 Representative Viewpoint Appraisal

The viewpoints presented within this report, represent a range of visual receptors and view types, and have been selected following SNH Guidance. The viewpoint photomontages have also been taken from a range of publically accessible points, to cover a representative range of viewing distances, elevations and orientations, with different viewing experiences. The micro-siting of viewpoints in the field has sought to maximise an open and clear view where available, whilst remaining tied to an identified 'key receptor group' for the viewpoint in question. A total of 10 viewpoints were selected for assessment and agreed in consultation with Angus council (Figure 5-3). The sensitivity to the change is summarised in Table 5.5.

Table 5-5: Representative Viewpoint Baseline

VP	Location	Grid Ref	Distance of View	Key Receptor Grp Static*/Sequential**	Sensitivity to change
1	White Myre	E357205, N757040	1.2km	Residents (south)	High
2	Angus Core Path 64, Burghill Wood	E359525, N758302	3.4km	Visitors (Angus Core path 064)**	High - Medium
3	A90 southbound (2km west of Brechin Castle Visitor Centre)	E355247, N759491	2km	Travellers **	Medium - Low
4	Brechin north – Pittendrich Road	E358646, N760759	4km	Residents (north)	High - Medium
5	A90 northbound Finavon	E349635, N757468	6.5km	Travellers **	Medium - Low
6	Turin Hill	E351468, N753547	6.3km	Visitors – hill walkers at summit*	High
7	White Cathertun	E354691, N765981	8.4km	Visitors – hill walkers at summit *	High
8	Minor Rd, Fithie / Rossie Moor	E363255, N754698	7.7km	Travellers **	Medium - Low
9	B9134 eastbound near Netherton	E355145, N757776	1km	Travellers **	Medium - Low
10	Flemington Tower Aberlemno (Cult Hert)	E352593, N755739	4km	Visitors (Cultural Heritage access)**	High - Medium

5.4 Construction Effects

Whilst there would be a degree of visual disturbance arising from construction activity, the proposals aim to minimise disturbance to the land itself and thought has been given to the detailed siting of the turbine in order to minimise potential disturbance to the physical landscape and the effect on sensitive views.

There would be some temporary effects on the landscape fabric of the site as the result of ground disturbance during construction, including minor earthworks for sections of the access track and the turbine base. These elements would not involve any removal of notable landscape features or characteristic elements and would be visually contained within the site context. Good site management plus reinstatement at the end of the construction phase will minimise the extent and duration of these effects. The magnitude of effect on the landscape fabric would, therefore, be Low. When combined with a Medium baseline sensitivity to the proposed change, the extent of effect is judged to be Moderate to Minor. All effects on the fabric are also considered to be substantially reversible in the long-term, following de-commissioning of the turbine.

With regard to the wider landscape character of the study area, it is anticipated that there would be no significant effect on the key characteristics of the surrounding LCTs until the later stages of construction when the turbines are more visible from these areas. These operational effects are dealt with separately in Section 5.6.

Mitigation Measures

The principal opportunity for incorporating mitigation into the scheme has evolved, during the scheme development, where a number of turbine options were considered.

In relation to landscape and visual issues, the final size, location and turbine number was selected to limit visibility from the nearest sections of the landscape and imposition on residents. Thought was also given to avoiding any potential tree, vegetation or field boundary loss and the relationship with the emerging pattern of operational and consented schemes that overlook the Strathmore area.

5.5 Operational Effects

During the operational lifetime of the turbine, the principal landscape and visual effects would arise from the presence of the turbine and the movements of the blades. There would also be some activity connected with site works to build the control building, access track, underground cabling, crane pad and temporary construction and laydown area, with occasional vehicle movements required for maintenance but these are unlikely to be a significant factor.

5.5.1 Predicted Effects on Landscape Character

Low Moorland Hills LCT

The proposed wind turbine would be located within the Low Moorland Hills LCT (Montreathmont Moor LCA). This expansive LCT extends to cover most of the immediate landscape context, principally to the south. It is therefore the LCT most directly susceptible to the effects of the proposal.

As the ZTVs (Figures 5-3 to 5-4) indicate, there would be high theoretical visibility from the host LCT within 3-4km, extending across open farmland to the north of Montreathmont Forest. This is clearly focused on the local LCA of Montreathmont Moor, with notable forest cover screening visibility from wider sections of the LCA to the south.

While there would be some isolated points of extended visibility from hill summits to the west, the opportunity for notable visibility would be limited within the more sensitive sub LCA of the Forfar Hills area and its more complex, modest scale and distinctive characteristics. As a result there would be limited potential for notable effects on the landscape characteristics of this LCA and sub area of the Low Moorland Hills LCT.

Where the turbine would be visible, it would typically be seen across the open, gently undulating farmland and against a simple palette of medium to large scale characteristic elements within an expansive lowland area. While it would provide a notable new element in the immediate context along the north side of this LCT, and across the escarpment descending to the River South Esk "*the simple topography, medium to large scale rectilinear pattern and extensive commercial forestry*" as noted in the SLCA, all help to accommodate the profile of the turbine. It would, therefore, not be out of scale with the nature of its setting and would not fundamentally alter the balance of landscape characteristics within the wider context of the LCT. Nor would it notably affect the more sensitive visual points of the LCT or their setting, including the defined viewpoints at Finavon Hill, Angus Hill layby and Turin Hill, as noted in the SLCA.

The magnitude of change on the characteristics of the LCT is therefore considered to be Medium within 2km to the south and Low to Negligible elsewhere. When combined with a baseline sensitivity of Medium for the landscape the Montreathmont LCA, the extent of effect on the Montreathmont LCA is judged to be Moderate within 2km. Elsewhere, and from the adjacent Forfar Hills LCA, the extent of effect would be Minor to Negligible, with no significant effect on the general scale, simplicity and wider pattern of key characteristics of moderate value.

These tie in with the sensitivities and capacities noted in the SLCA and the guidelines which define the area as having "the highest underlying capacity in Angus for wind energy development" with " the capacity to accommodate larger sizes of turbine (up to 80m) and/or greater numbers and concentrations relative to other areas of landscape in Angus.

Effects on Surrounding LCTs

The ZTVs (Figures 5-3 and 5-4) indicate that there would be some intervisibility between the proposed wind turbine and the surrounding LCTs. From the nearest LCT along the Broad Valley Lowland LCT and its sub LCA, the Lower South Esk and North Esk Valleys, visibility would stretch across the nearest fringe sections of the LCA including the open farmland to the north and south of the South Esk river corridor. Visibility would then be largely absent from the lower strath areas, the actual river corridor of the South Esk and the more valued historic and settled sections of the area, but would again be present on the upper north strath slopes.

From these points, the proposed turbine would be observed at varying degrees to the rear of the escarpment slopes that form an adjacent backdrop to this LCT and enclose the strath. While it would form a skyline feature from isolated points between Brechin and the A90, it would sit within a clearly separate section of the wider landscape that surrounds the strath and importantly away from the focus and orientation of key characteristics within the strath farmland so as not to significantly impose on them. Most typically between the South Esk and A90 the turbine would also sit behind the notable enclosure pattern of woodland and coniferous forest. From the south side of the River Esk, where the key defining characteristics of the river corridor and its setting can be appreciated more fully, the turbine would sit more substantially to the rear of the notable change in landform associated with the adjacent LCT.

As a result the nearest sub area of this LCT and its key focus on the enclosed landscape around the meandering South Esk, would not be compromised to a significant degree. The restricted nature of most views is then evidenced by the photomontages and assessments from viewpoints 3-5 and 9), which demonstrate that the turbine relates clearly to the adjacent lowland hills LCT to the rear of this area.

At other elevated points to the north the turbine would sit into the surrounding landscape context associated with the expansive Montreathmont Forest and Moor area and would more typically be backclothed by these expansive large scale features in the landscape. This would help to contain the profile in the LCT.

In addition, from most points in this LCT the proposed turbine would also be seen in the wider context of other operational wind turbine influences, which have modified the elevated Strath character, principally to the north. As a result the proposed turbine would not form an entirely a new element in this stretch of the LCT, but would be seen as a similar scaled element to other influences, at similar elevated points within the LCT.

The magnitude of change on the characteristics of this nearest LCT is therefore considered to be Medium, across the transitional slopes within 3-4km between the A90 and Brechin. It would then be no more than Low elsewhere. When combined with a baseline sensitivity of Medium, the extent of effect is judged to be Moderate within 3-4km and Minor to Moderate elsewhere. This is summarised in Table 5-6.

5.5.2 Landscape Designation

There are a number of national landscape designations within the wider study area, but none exist within the immediate context of the development in the Montreathmont Moor landscape. While there would be some visibility from the fringes of the nearest locally defined area within Angus, the Principal Geographical Area across the coast around Montrose Basin (Figures 5-3 and 5-4), the views would be notably outwith this area and to a separate low lying landscape context to the west. At these points, views would only be gained to the extended blade tip, which would only form a minor intermittent element in the distance. As a result there would be no significant change in the context from these areas and no potential for significant effects on the qualities for which this area has been designated. This would also be the case for the fringes of the highland area, as evidenced by viewpoint 7. The proposed turbine would not, therefore, undermine the integrity or setting of these areas, as noted in table 5-6.

The nearest section of the more sensitive areas lies at The Coast (4.5km to the east, with the Highland areas stretching from 7km to the northwest. The area around the site is then classified as a less sensitive Lowland and Hills area

5.5.3 Effects on Historic Landscape (Landscape Setting)

The majority of historic features within the study area are connected with the lower lying, settled sections of the surrounding Strathmore area. They are also situated at contained points, beyond the principal areas of ZTV (Figures 5-3 and 5-4). This would include the nearest CA and GDL at Brechin and Brechin Castle, which are substantially contained by vegetation patterns and landform variation. As a result there would be limited potential for effect on views and the landscape setting of these areas. The underlying nature, setting, sense of place and historical focus of these areas will thus remain intact with the turbine proposal being physically, culturally and visually separate. The potential effects on elements within these designated areas are discussed in more detail within the Cultural Heritage section.

5.5.4 Landscape Effects Summary

The assessment has shown that effects on the landscape and its characteristics would be limited in extent and significance. Where they do occur they are limited to the immediate open, farmland on the north side of Montreathmont Moor LCA, within 2km and then transitional fringes slopes connected with the Broad Valley Lowland within 3-4km between the A90 and Brechin. At these points the turbine would provide an intermittent focus, but would not dominate the underling balance of elements in the Strath landscape, with a range of other tall built influences in this section of the strath sides. As a result, there would be no adverse affect on the wider scale, focus, integrity or setting of key features in the surrounding landscape and it would not, be out of scale with other elements in the landscape. This is summarised in Table 5-6.

Table 5-6: Landscape Effects

Character Type	Sensitivity to change	Magnitude of Effect	Extent of Effect
Low Moorland Hills LCT (Montreathmont) Low Moorland Hills LCT (Forfar Hills)	Medium Medium – High	Medium (2km) Low -Negligible	Moderate (2km) Minor - Negligible
Broad Valley Lowland LCT (Lower S&N Esk)	Medium	Medium (3-4km)	Moderate (3-4km) Minor - Moderate
		Low	
Designated Landscape			
Principal geographical areas - Coast	High - Medium	Negligible	Negligible
Principal geographical areas - Highland;	High -Medium	Low -Negligible	Minor - Negligible
Historic Landscape (landscape setting)			
Brechin CA	High	Negligible	Negligible
Brechin Castle GDL and CA	High	Negligible	Negligible
Application Site			
Landscape Fabric	Medium	Low	Moderate - Minor

5.5.5 Principal Zones of Theoretical Visibility

As the ZTVs (Figures 5-3 and 5-4) illustrates, the principal zones of visibility would be concentrated across the open farmland to the north side of Montreathmont Forest. It would then stretch over more elevated open farmland within the Strathmore Valley, primarily between Brechin, Tannadice and Finavon. However, characteristic landcover and enclosure pattern would limit the extent of visual exposure, primarily to within 2-3km to the north, south and east and 4-5km to the northwest and northeast (Figure 5-4). It would then be further restricted from key stretches of the lower strath areas and the focus of valued aspects along the river corridors.

Visibility would then stretch over more intermittent points within the more distant Highland foot hills at Menmuir, to the north and to other fringe areas of dipslope farmland to the south, the elevated northern fringe of Rossie Moor and along the A934 to the south of Montrose Basin. At these distances the proposed turbine would be seen within wide open panoramic views which take in a range of varied urban and rural landscapes, including existing wind turbine influences at intervening points. Notable landform variation and coniferous woodland would then restrict visibility from much of the surrounding area, particularly around much of the lower lying settled areas within Forfar, Kirriemuir and Brechin.

5.5.6 Representative Viewpoint Effects

The analysis detailed in Table 5-7, refers to the potential visual effects on the 10 representative viewpoints identified in the baseline. To help understand the assessment, reference should be made to the existing panoramas, wireframes and photomontages (Figures 5-5 to 5-14), which illustrate the existing and proposed view.

Table 5-7: Representative Viewpoint Effects

Location	Sensitivity	Visual Effect	Magnitude of Visual Change	Extent of Effect (Represented)
Viewpoint 1 - White Myre (access road)	High	From this near point to the southeast, the proposed turbine would be clearly visible within a broad, undulating panorama over the low moorland hills landscape (Figures 5-5a-c). In the view, the full blade diameter would be visible within the undulating farmland that defines the majority of the view, sitting to the rear of a local landform. While it would provide a clear distinctive element above the local and distant highland hills skyline, it would be seen in the context of a simple scaled undulating farmland which would help to anchor the turbine into the view. It would therefore be comparable in scale to the height of other features in the view including the woodland blacks to the west of the view. This would represent a medium to high magnitude of visual change. When combined with the baseline sensitivity from the key receptors of residents with a key view to the northwest at this isolated property, the extent of visual effect is considered to be moderate to major. Given the sparse coverage of residents the potential for other views and would be fairly limited.	Medium - High	Moderate – Major
Viewpoint 2 - Angus Core Path 64, Burghill Wood	High- Medium	From this point on a locally defined Core path at 3.4km to the east, the proposed turbine would be visible in a channelled view to the west, where it would sit in the mid distant view. While it would be observed with the tower, hub and blades visible above the small section of the distant skyline it would sit at a contained point in the view, where it would be observed in a sharp perspective with the edge of Burghill Wood and landform context at Craigend (Figures 5-6a-c). Both of these elements rise dramatically either side of the turbine in the nearer view to provide clear elements of scale and focus and structure in the view. Although it would be add a new reference into the view, it would also be seen in the context of the telecommunications tower at Craigend. These will help to accommodate the visual profile of the turbine and reduce the potential for scale contrast or overlap with the balance of elements in the view. The remained of the view context then stretches of the expansive Montreathmont moor area with few other notable landcover features. The magnitude of visual change is, therefore, considered to be medium. When combined with the baseline sensitivity from the key receptors of walkers at this point on the road between two core paths, the extent of visual effect is considered to be no more than moderate, from this point. From the remaining sections of the core path 64 the turbine would then be screened until it heads back onto a road at the west side of Burghill Wood.	Medium	Moderate
Viewpoint 3 – A90 southbound	Medium - Low	At this point on the A90 at 2km to the north, the proposed turbine would be visible to the rear of notable coniferous woodland which extends across the majority of the mid distant view to enclose the immediate focus and context of the view. At this point the hub and blades would be evident in the view just above the wooded skyline (Figures 5-7a-c). The remaining section of the tower would then be screened. It would therefore be observed in glimpsed views away from the direction of travel and as a background element in the wider view. As a result the magnitude of visual change is considered to be low. When combined with the baseline sensitivity from the key receptor group of travellers the extent of visual effect is considered to be moderate to minor. This would be the case for most sections of the A90 at Brechin for up to 4-5km to the east and much of the view from the west towards Finavon, woodland cover filtering most views.	Medium	Moderate - Minor
Viewpoint 4 - Brechin north – Pittendrich Road	High-Medium	From this point at 4km to the northeast, the proposed turbine would be clearly visible in a distant section of the open view to the west. It would be seen with the tower, hub and blades, sitting above the skyline, to the rear of intervening farmland, woodland and other settlement fringe structures and infrastructure along the A90 (Figures 5-8a-c). While the proposed turbine would be seen as a clear element, it would sit within an open, simple context at a lower point of the ridgeline that defines the south side of the view. It would also be seen with a range of other tall built structures including overhead pylons and telecommunications masts, which traverse both the lower view to the west and the escarpment ridge towards Montreathmont. These elements also run across more sensitive sections of the view towards higher hills summits at Finavon Hill. As a result these will help to moderate the magnitude of visual change, which is considered to be Medium. When combined with the baseline sensitivity from residents, beyond the curtilage and focus from the house, the extent of visual effect is considered to be moderate from this isolated point of Brechin. This type of view and effect would only stretch for around 150m before the view is screened. This will reduce the potent for notable effects from most other residents and other sensitive receptors within Brechin.	Medium- High	Moderate- Major
Viewpoint 5 - A90 northbound Finavon	Medium to Low	From this section of the A90 to the west, the proposed turbine would not be that discernible in the view. It would sit notably to the rear of mature woodland cover, which defines and encloses the lower view along the South Esk Valley in the mid to far distance (Figures 5-9a-c). While the turbine blades may intermittently appear above intervening woodland and be more evident during winter months, it would be observed at a distant point of the skyline and at a lower point to the sweeping scale of the Hill of Finavon, which would help to reduce the profile in the view. The underlying scale and balance of elements in the view would therefore be largely unaffected. The magnitude of visual change would therefore be low to negligible. When combined with the baseline sensitivity from the key receptor group of travellers on the A90 the extent of visual effect is considered to be minor to negligible. This would also be the case form most views from the A90, to the east with just isolated glimpsed views present.	Low - Negligible	Minor - Negligible
Viewpoint 6 - Turin Hill	High	From this notable high point within the eastern fringes of the Forfar Hills sub character area of the Low Moorland Hills, an expansive descending panorama stretches over the lower Montreathmont moor sub character area and on towards the higher Garvock hills to the northeast and highland foothills to the north. In this view the tower and blades of the proposed turbine would be visible within the lower farmland area, which extends to backcloth the turbine (Figures 5-10a-c). It would also sit entirely within this area with no notable overlap with the higher hill ridges to the northeast. Nor would it encroach upon the smaller steep hills and ridges around Turin Hill or	Low to Negligible	Moderate -Minor

Location	Sensitivity	Visual Effect	Magnitude of Visual Change	Extent of Effect (Represented)
		other section of the Forfar Hills area. It would also be seen in the wider context of wind energy developments with prominent hill top developments siting to the northeast. This would represent a low to negligible magnitude of visual change. When combined with the sensitivity from the key receptor group of walkers with fixed views at the summit, the extent of visual effect is considered to be no more than moderate to minor.		
Viewpoint 7 - White Cathertun	High	From a notable high point at 8.4km to the north, the proposed turbine would not be that discernible, within the wider focus of this view. Although the hub and blades would be apparent in a small section of the view, the turbine would sit as a diminutive element to the rear of a local landform and would be further backclothed by landform and coniferous woodland (Figures 5-11a-c). It would then be observed in the context of open fields, wooded shelterbelts with a strong horizontal, linear emphasis and notable areas of coniferous woodland plantation, which provide elements of large simple landcover in the mid distant view. It would not interrupt any views to more distinctive landform summits or hill ranges nor overlap with the setting of the highland foothills in the near foreground. This would represent a low to negligible magnitude of visual change. When combined with the sensitivity of visitors to this point, the extent of visual effect is considered to be no more than moderate to minor.	Low - Negligible	Moderate -Minor
Viewpoint 8 - Minor Rd, Fithie / Rossie Moor	Medium - Low	From this point just off the A934, a broad descending view stretches over the wooded farmland and parkland of Kiniard Park on the west side of the Lowland Loch Basin area and across the notable coniferous woodland of Montreathmont Forest. In the view the proposed turbine would sit to the rear of this context in a small section of the view, with the blade diameter visible above evergreen woodland Figures 5-12a-c). From this distance and elevation, the turbine would then be entirely backclothed by the higher highland summits but away from the highest hill summits and peaks. It would in effect sit between the two landscapes and as a comparable built influence to a telecommunications tower to the east. As such the magnitude of visual change is considered to be low. When combined with the sensitivity from the key receptors of travellers, the extent of visual effect is considered to be minor. Although the sensitivity of local residents would be slightly higher, the focus of properties lies to the east at this point and the proposals would be peripheral to key views with no significant effect predicted.	Low	Minor
Viewpoint 9 - B9134 eastbound near Netherton	Medium to Low	From this local point to the west side of the site, the proposed turbine would be visible just to the rear of the broad, sweeping farmland hillside which defines and encloses the view to the south from this point (Figures 5-13a-c). In the view, the full blade diameter would be visible to the side of the local hill summit. While it would provide a clear distinctive element above the local skyline, it would be seen in the context of a simple scaled landform context which continues to ascend to a similar height to the turbine in the view. This would represent a medium magnitude of visual change. When combined with the baseline sensitivity from the key receptors of travellers with clearer views to the north, the extent of visual effect is considered to be no more than moderate. Given the sweeping nature and scale of the hillside notable views from residents in Netherton will be limited in extent and effect .	Medium	Moderate
Viewpoint 10 - Flemington Tower Aberlemno	Medium - Low	From this point on the access road to the cultural heritage site, a broad open view is gained over the low moorland hills and farmland to the north side of Montreathmont Forest and Moor. In the view the proposed turbine would sit to the rear of a flat topped moorland hill, with the tower, hub and blades visible in a distant section of the view Figures 5-12a-c). From this distance and elevation, the turbine would then sit to the lower side of a further hillside at Craigend and would appear nestled between the two, with the hub height sitting at a similar height to the hill tops. It would also be seen at a lower height than the overhead pylons which traverse the nearer hillside and with a telecommunications mast on the further hill so it would not entirely represent a new built element within the view. As such the magnitude of visual change is considered to be medium. When combined with the sensitivity from the key receptors of visitors on the access road to the tower, the extent of visual effect is considered to be no more than moderate. From local residents, the focus of properties lies away from the proposed turbine and the turbine would be peripheral to key views with no significant effect predicted.	Low	Minor

5.5.7 Effects on Visual Receptor Groups

The extent of effect upon visual receptors would depend on the principal aspect and amenity value of the receptor and the orientation of key views, which in turn would depend on the existence or otherwise of intervening, landform, built elements and/or vegetation. The extent of effect would also depend on the distance from the proposed development, the mobility or static nature of the receptor and the potential for the development to attract the eye or to become a focal point in the view, to the detraction or benefit of competing visual elements. This would include the presence or absence of other comparable features, including existing wind farm elements.

5.5.8 Effects on Residential Amenity

The assessment of effects on residential amenity is an additional measure of visual effect, which can be related to LVIA. The usual approach to establishing the level of effect on residential amenity is to define the key orientation and focus of principal views for each property (or group of properties) within 1-2km, as these are fixed, constantly available views with a greater degree of amenity or value attached to them. This is recognised in GLVIA (3rd edition) which describes the susceptibility (or sensitivity) to visual change as a function of "*the occupation or activity of people experiencing the view at a particular location and the extent to which their attention or interest may be focused on the view*".

GLVIA also addresses residential amenity as "*residents at home, especially using rooms normally occupied in waking or daylight hours, that are likely to experience views for longer than those passing through*". Views from other points away from the principal, constant focus, and within the wider curtilage or from the general approach to the properties would, therefore, be less susceptible, as these views are secondary or peripheral to the amenity value and at sequential or transitory points.

Given the dispersed nature of the settlement pattern within the site context, only a very small number of residents would experience any notable direct views of the proposed turbine in key views from their property. These are likely to be greatest from isolated points within 1-2km, principally to the south, where direct, level, open views are available. They include properties at Whte Myre (Viewpoint1), House View House, Wandersheill, Balnacake, within 1km and at further points, Blibberhill, Stonybrigs. It would also include an ascending partial view from Broomknowe Cottages to the north.

While there is also likely to be potential for some effect away from the principal aspect of houses, within the wider curtilage and general approach to the properties at other points within 2km including Chapel Cottage, The Old School House, Mains of Aldbar and then from the north at Broomknowe, Balnabreich, Wesr Kintrockat and the north side of Netherton, as demonstrated by the viewpoint assessment (VP9), within views from the closer points being more restricted by landform and vegetation screening the view. Elsewhere views would be restricted from most other settlement clusters at Aberlemno, Tannadice and within Brechin.

The visual change as a significant effect in principal views from property would, therefore, be experienced by a relatively small number of people. When considered together, in line with GLVIA to help reach an overall conclusion on the community as a whole, the overall extent of effect on residential amenity is not considered to be significant.

Beyond these points the potential for notable visibility would be limited on property clusters and settlement, including Aberlemno and Tannadice and the main settlements of Brechin, Forfar and Kirriemuir. Where views are available at these further points, the turbine would be seen in more distant, peripheral expansive views alongside a range of other natural and built elements in the view. The effect from these more distant points would, therefore, not be significant.

5.5.9 Effects on Travellers

The ZTVs show that there would be potential visibility from intermittent points along the A90, between Finavon and Brechin, principally up to 10km. In reality, significant effects would be limited from the A90 given the level of roadside embankments and notable sections of intervening woodland cover. The turbine would therefore, only be seen in fleeting views as a minor peripheral element away from the direction of travel. Elsewhere the proposed turbine would be seen from minor roads surrounding the site. However, given the underlying landform variation and woodland cover, it would usually be seen to the rear of the immediate farmland context and in fleeting, peripheral views. From the nearest road to the north the B9134, the notable change in landform also restrict significant views. As such significant effects on travellers would be limited.

5.5.10 Effects on Visitors and the Tourism / Amenity Resource

This receptor group comprises a broad category with different objectives and, therefore, differing levels of sensitivity. A number of significant tourist areas, in the study area are located within the elevated highlands to the north or the low-lying settled landscapes and coastal areas to the east are as such, generally screened from the proposed development, with no notable effect predicted. This includes the local GDL's at Brechin Castle and Kinnaird Park, Montrose Basin and the Principal Geographic Areas across the coast and highlands Angus. Where views are available from other elevated hill tops including White Cathertun, the Hill of Finavon and Turin Hill the proposed turbine would normally be seen within broader, far reaching views, away from the immediate focus and setting of these points, to a separate, lower lying section of the landscape, with other human influences present. These also include other comparable wind turbine influences at other similar elevated points overlooking the Strathmore and Montreathmont context. The overall extent of effect on this receptor group is not considered to be significant.

5.5.11 Visual Effects Summary

The visual assessment shows that, geographically, the extent of significant visual effect is relatively low, being restricted to isolated points within 1-2km.

The detailed viewpoint assessment has indicated a reasonable picture regarding the significance of effects upon visual receptors. In EIA terms, there would be significant effects of Moderate to Major, at just one viewpoint at White Myre to the south. Moderate significant effects were noted from three viewpoints. One from a minor road as it passes the site, one from an isolated stretch of the a local core path and the third from a point on the approach to isolated residential properties on the north side of Brechin, with no significant effect on the key focus of views from within the property anticipated. No significant effects are predicted on key receptors at the remaining six viewpoints assessed.

When considered together in line with GLVIA to help reach an overall conclusion on the level of significance on all relevant key receptor groups "*by aggregating properties as a way of assessing the effect on the community as a whole*", the overall effect on visual amenity is not considered to be significant. This is due to the relative sensitivity of the site context within the lowland area, the dispersed nature of receptors, as well as the size and location of the turbine within it.

5.6 Cumulative Effects Summary

The purpose of the cumulative assessment is to consider the potential effects upon the landscape and visual environments in relation to existing wind turbine developments and other known consented and proposed wind turbine developments in the area. It raises questions over thresholds of acceptable change (spatial and temporal) and the landscape's capacity to accept change. GLVIA (3rd edition, 2013) advises that "*cumulative landscape and visual effects result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future*".

Collectively, should all of the identified wind farms be built (Figure 5-15), they would provide an intermittent built influence at elevated points in the surrounding landscape. The emerging focus of this pattern within 10-15km, lies at elevated points within or adjacent to the Strathmore area. They include key locations, on the elevated north strath slopes or higher Menmuir Foothills section of the highlands to the north. They also include the Muir of Pert to the east of Brechin and at isolated points within the Montreathmont Forest and Moor Area as shown in Figure 5-15. This links in with the SLCA guidance for steering development in this area. The SLCA also notes that the site context has "the highest underlying capacity in Angus for wind energy development" with "the capacity to accommodate larger sizes of turbine (up to 80m) and/or greater numbers and concentrations relative to other areas of landscape in Angus.

As the ZTVs indicate (Figures 5-16a-b), the theoretical cumulative exposure of existing wind farm developments, will be varied. The four developments at Balhall Lodge, North Mains of Conosyth, Arrat Farm and East Pitforthie, will all be visible across the open farmland that surround the development site on the north side of Montreathmont Forest. Their visibility will also be, at times more extensive than the proposed turbine and stretch to more sensitive highland and lowland areas, including the coast and highland geographical areas. In addition there will be intervisibility across the Strathmore valley areas to the west of Brechin. The proposed turbine would therefore, rarely add to the existing extent of visual exposure and seldom provide a new defined element into the landscape resource. It would, however, sit at a sufficient distance from the nearest operational turbines, in excess of 7km, so as not to significantly change or alter the underlying balance of elements in the landscape and visual resource. The cumulative landscape and visual effect of the proposed turbine, in combination with other existing developments would not, therefore be significant, with no extensive visible overlap or complexity in developments from the vast majority of views in the surrounding landscape and only a moderately strengthened element locally.

When considered further with the consented schemes(Figures 5-17a-b), there would be higher potential for combined theoretical visibility with the two schemes at Dunswood and East Memus, with all three schemes visible across key sections of the Montreathmont Moor LCA and surrounding Strathmore valley along the Lower South and North Esk river Valleys. Combined theoretical visibility would then be reduced with the developments at Balrownie and Pickerton, given the more notable influences of intervening landform and landcover features. The proposed turbine would, therefore, contribute a modest addition to the pattern of individual wind turbine elements that sit at the upper strath slopes or just within the fringes of adjacent landscapes. The potential for notable change in the balance of characteristics and change in the nature of the view would again be limited though, given the broad, open context of the underlying landscape and clear separation of developments at a minimum of 6km.

This is evidenced by the cumulative wireframes, which demonstrates a clear separation of single wind turbine elements in expansive views along or across the strath landscape and cumulative views being successional rather than combined from the majority of places. The overall cumulative effect of the proposed turbine, in combination with other existing and consented developments is not, therefore, considered to be significant with no overlap, complexity or concentration in developments from the vast majority of the surrounding landscape.

There are then several further single turbine schemes in planning with one or two in the Montreathmont Moor LCA and several scattered at further elevated points of the Broad Valley Lowland along Strathmore. Of note to the development there would be a higher potential combined theoretical exposure with the developments to the south at Cotton of Pitkennedy Farm, Bolshan Farm. However, the potential for notable conflict in the local character of Montreathmont Moor and change in the balance and nature of views, with these turbines would be limited. This is due to the clear separation and focus of these developments within a landscape defined by "simple topography, medium to large scale rectilinear pattern and extensive commercial forestry".

The potential for additional effect on the landscape and visual resource arising from the proposed single turbine at Netheron, would not therefore be significant, with a clear separation to other developments, limited visual complexity and overlap and a location which fits with both the emerging pattern of operational and approved development and is in accordance with the capacity guidance in the SLCA.

5.7 Summary

Following the LVIA, it is considered that both the scale of the turbine proposed and its location, within the Montreathmont Forest and Moor LCA are both appropriate. While it would introduce a wind turbine element into the open farmland on the north side of the forest area and would be seen from the nearest section of the adjacent strath, it would largely form a modest built element which is comparable to other tall built elements in this section of the landscape and would be seen against a large simple pattern of topography and landcover elements. The location and character of the receiving environment, therefore, has the ability to accommodate this change with a reasonable effect on the wider landscape and visual resource, whilst limiting the potential for effect from more valued, low lying settled areas and more remote highland areas to the north.

Furthermore, whilst there will be acknowledged changes in the local landscape, these will be completely reversible and temporary given the turbine's anticipated life span.

5.8 References

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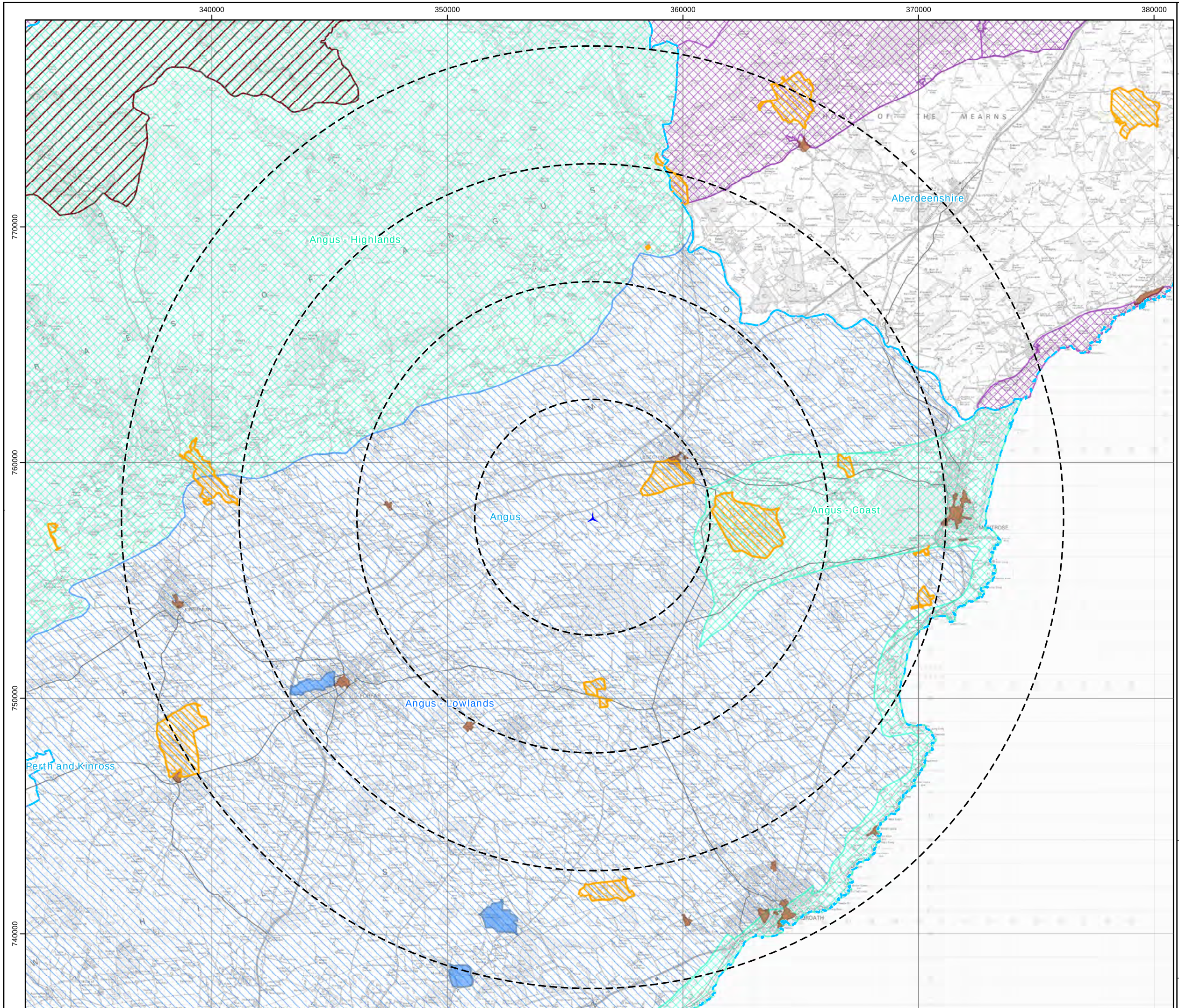
Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-1
Landscape Policy Context



Key

- Turbine location
- 5km turbine radii to 20km
- Council boundary
- Garden or Designed Landscape
- Country Park
- Conservation Area
- National Park

Council Landscape Designation

- Aberdeenshire - Area of Landscape Significance
- Angus - most sensitive Principal Geographic Areas
- Angus - less sensitive Principal Geographic Areas

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0 2.5 5 10

Kilometres

N

Scale @ A3:
1:150,000

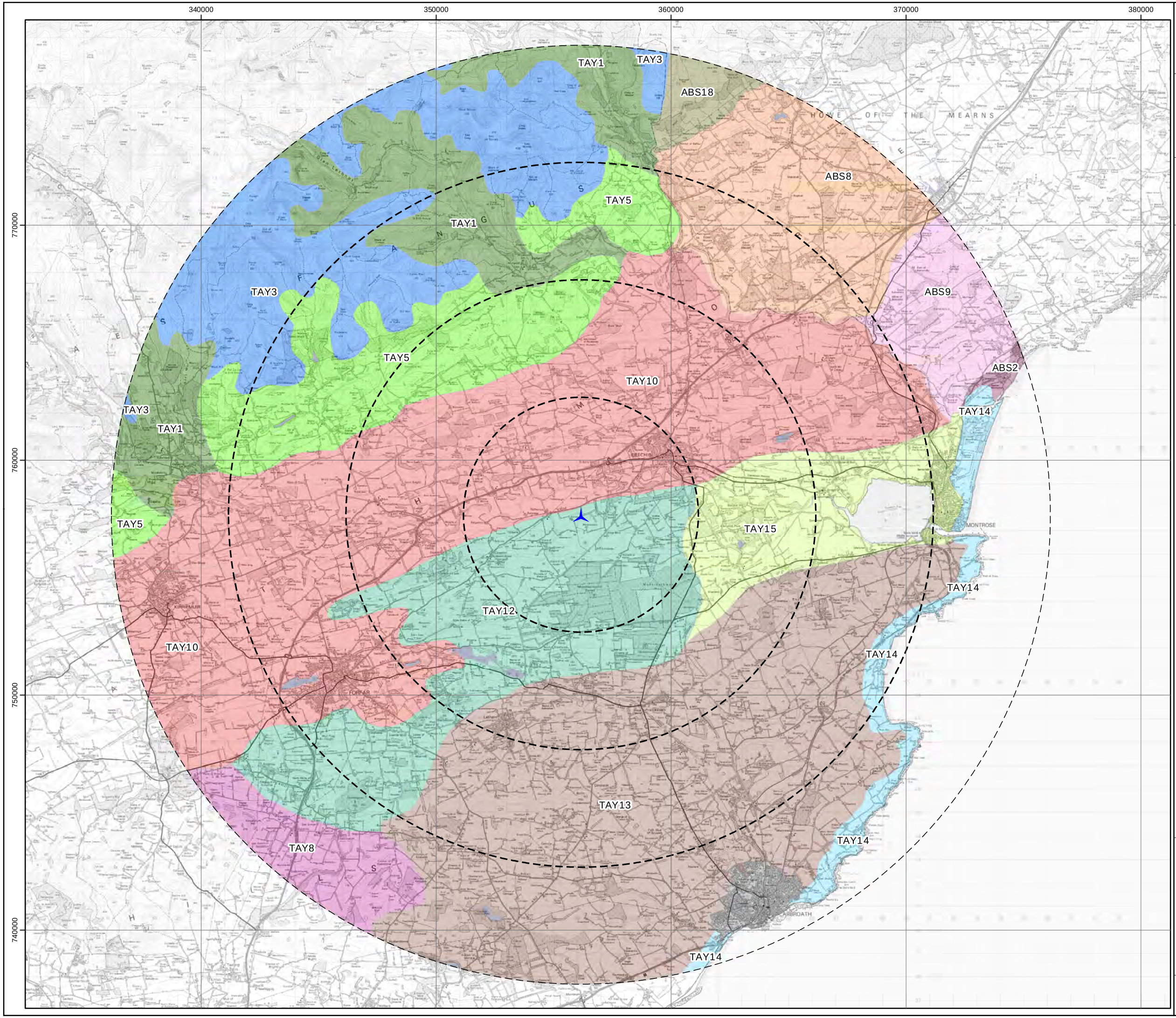
20/02/2014 TL01c 4611/LS/008a

Drawn by: AA Checked by: TH Approved by: AJ

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-2
Landscape Character Type



Key

- Turbine location
- 5km turbine radii to 20km
- Council boundary

Atmos LCA selection

- ABS2 - Coastal Strip
- ABS8 - Agricultural Heartlands
- ABS9 - Agricultural Heartlands
- ABS18 - Moorland Plateaux
- TAY1 - Highland Glens
- TAY3 - Highland Summits and Plateaux
- TAY5 - Highland Foothills
- TAY8 - Igneous Hills
- TAY10 - Broad Valley Lowland
- TAY12 - Low Moorland Hills
- TAY13 - Dipslope Farmland
- TAY14 - Coast
- TAY15 - Lowland Loch Basin
- LOCH - Inland Loch & Loch Island
- URBAN - Urban areas

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0 2.5 5 10

Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/LS/006a

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Figure 5-3
Bare Ground Blade Tip and Hub ZTV and Viewpoints

Key

- Turbine location
- 5km turbine radii to 20km
- Landscape Viewpoint

Zone of Theoretical Visibility

- 40m hub visible
- 67m tip visible

Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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0 1.25 2.5 5
Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/ZV/001a
Drawn by: AA Checked by: TH Approved by: AJ

Landscape Viewpoints
1 - White Myre
2 - Angus Core Path 64, Burghill Wood
3 - A90 southbound
4 - Brechin - Pittendreich Road
5 - A90 northbound Finavon
6 - Turin Hill
7 - White Caterthum
8 - Minor Road, Fithie / Rossie Moor
9 - B9134 near Netherton
10 - Flemington Tower Aberlemno

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

Figure 5-4
Screened Blade Tip and Hub ZTV and Viewpoints

Key

- Turbine location
- 5km turbine radii to 20km
- Landscape Viewpoint
- Forestry

Zone of Theoretical Visibility
(10m forestry screeing effect)

- 40m hub visible
- 67m tip visible

Landscape Viewpoints

- 1 - White Myre
- 2 - Angus Core Path 64, Burghill Wood
- 3 - A90 southbound
- 4 - Brechin - Pittendreich Road
- 5 - A90 northbound Finavon
- 6 - Turin Hill
- 7 - White Caterthum
- 8 - Minor Road, Fithie / Rossie Moor
- 9 - B9134 near Netherton
- 10 - Flemington Tower Aberlemno

Generated using Ordnance Survey's Terrain50 Dataset which does not take in to account the screening effects of buildings or vegetation.

Curvature of the Earth allowed for.
Observer eye height 2m above ground.

Distance of ZTV calculations based on SNH guidelines
51 to 70 m tip - 20 km
71 to 85 m tip - 25 km
86 to 100 m tip - 30 km
101 m to tip and above - 35 km

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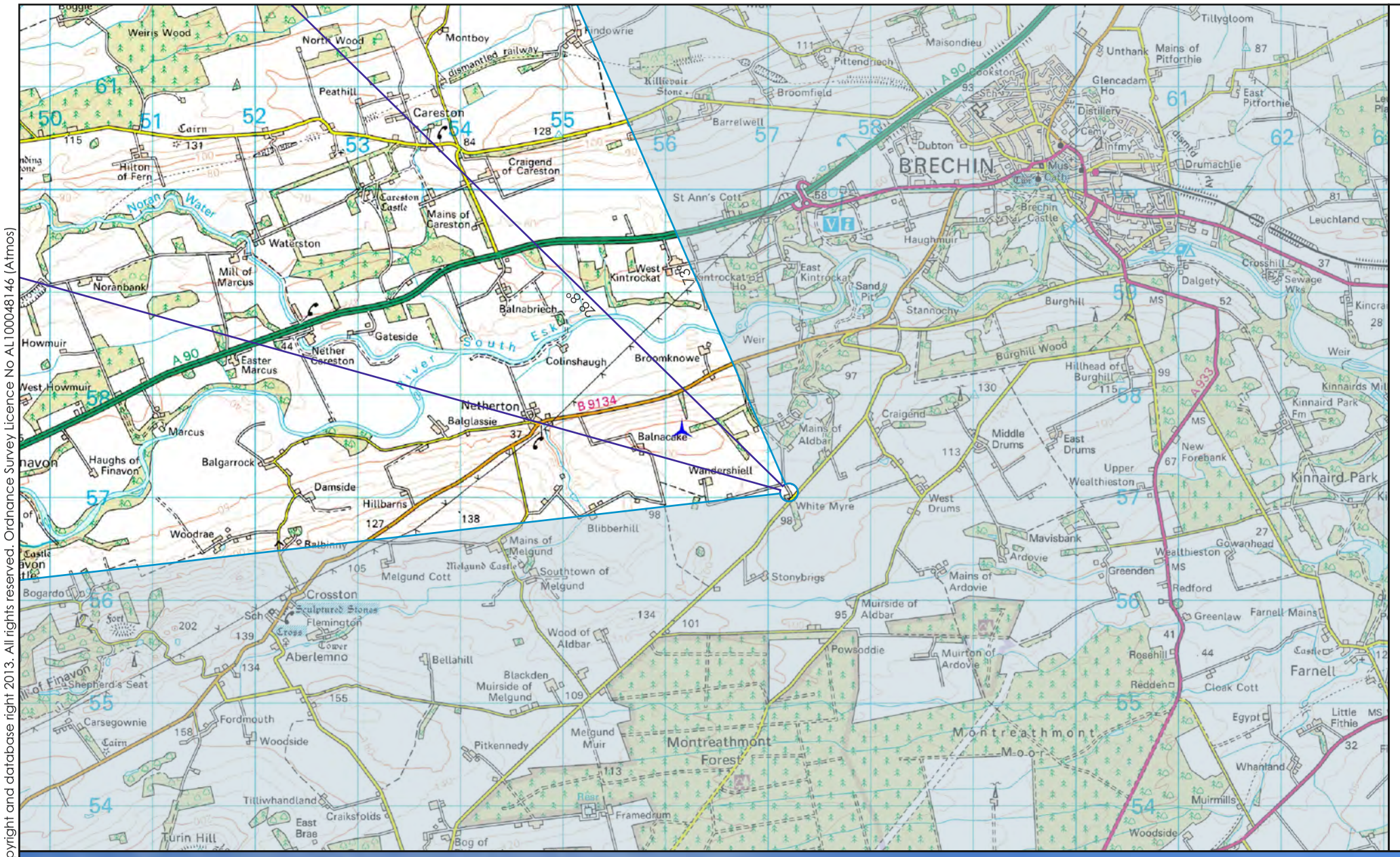
0 1.25 2.5 5
Kilometres

N

Scale @ A3:
1:150,000

20/02/2014 TL01c 4611/ZV/005a
Drawn by: AA Checked by: TH Approved by: AJ



Netherton Wind Turbine

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Figure 5-5a
Viewpoint 1 - White Myre

Viewpoint Data

Grid Reference	E357205, N757040
Elevation	98m AOD

Wireframe/Photograph

Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens

Proposed Turbine Information (Netherton only)

Hub Height	40m
Blade Tip Height	67m

Predicted Wireframe Turbine Visibility (Netherton only)

Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	1,223m

0km 3km

Scale 1:50,000@ A3

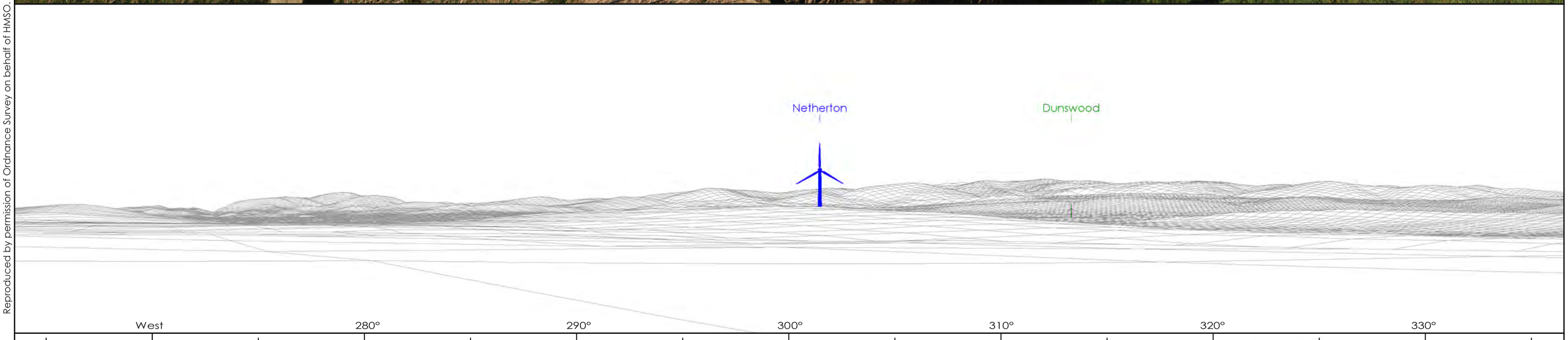
▼ Wide Angle Photo of Existing View Included Angle 110° Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

Drawn by	JM
Checked by	TP
Approved by	NT

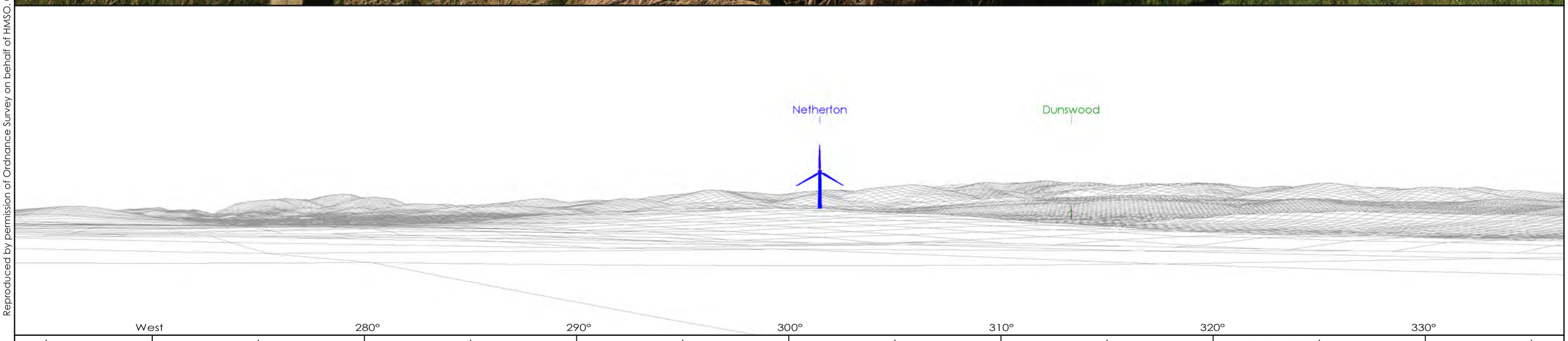
TI01c
10/02/2014
4611_PM_C011b

Existing View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 1: White Myre	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-5b		Drawn by JM Checked by TP Approved by NT TI01c 10/02/2014 4611_PM_C011b

Predicted View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 1: White Myre	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-5c		Drawn by JM TI01c Checked by TP 10/02/2014 Approved by NT 4611_PM_C011b

Predicted View (70mm Focal Length)

atmos CONSULTING	**Polar Energy (Netherton) Ltd**	**Netherton Wind Turbine**	Viewpoint 1: White Myre	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-5d		Drawn by JM Checked by TP Approved by NT TI01c 10/02/2014 4611_PM_C011b

Netherton Wind Turbine

Polar Energy (Netherton) Ltd

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Figure 5-6a
Viewpoint 2 - Angus Core Path 64, Burghill Wood

Viewpoint Data

Grid Reference	E359525, N758302
Elevation	123m AOD

Wireframe/Photograph

Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens

Proposed Turbine Information (Netherton only)

Hub Height	40m
Blade Tip Height	67m

Predicted Wireframe Turbine Visibility (Netherton only)

Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	3,421m

0km 3km

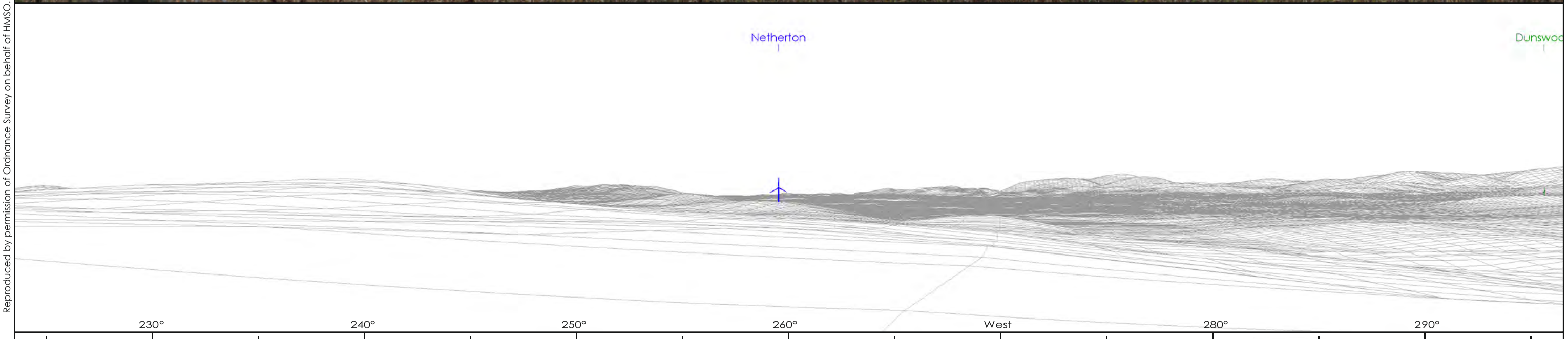
Scale 1:50,000@ A3

▼ Wide Angle Photo of Existing View Included Angle 110° Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

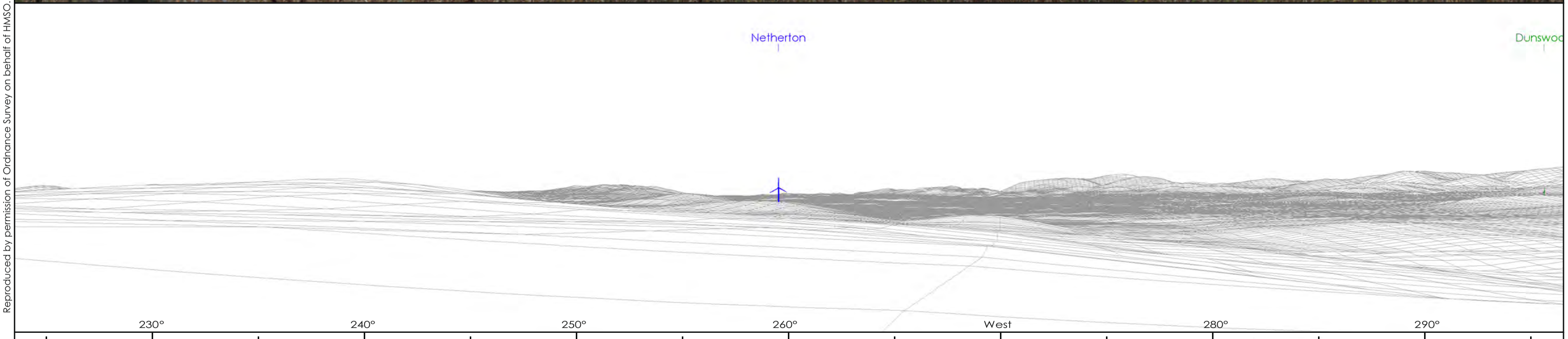
Drawn by JM	TI01c
Checked by TP	10/2/2014
Approved by NT	4611_PM_C012b

Existing View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 2: Angus Core Path 64, Burghill Wood	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-6b		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C012b

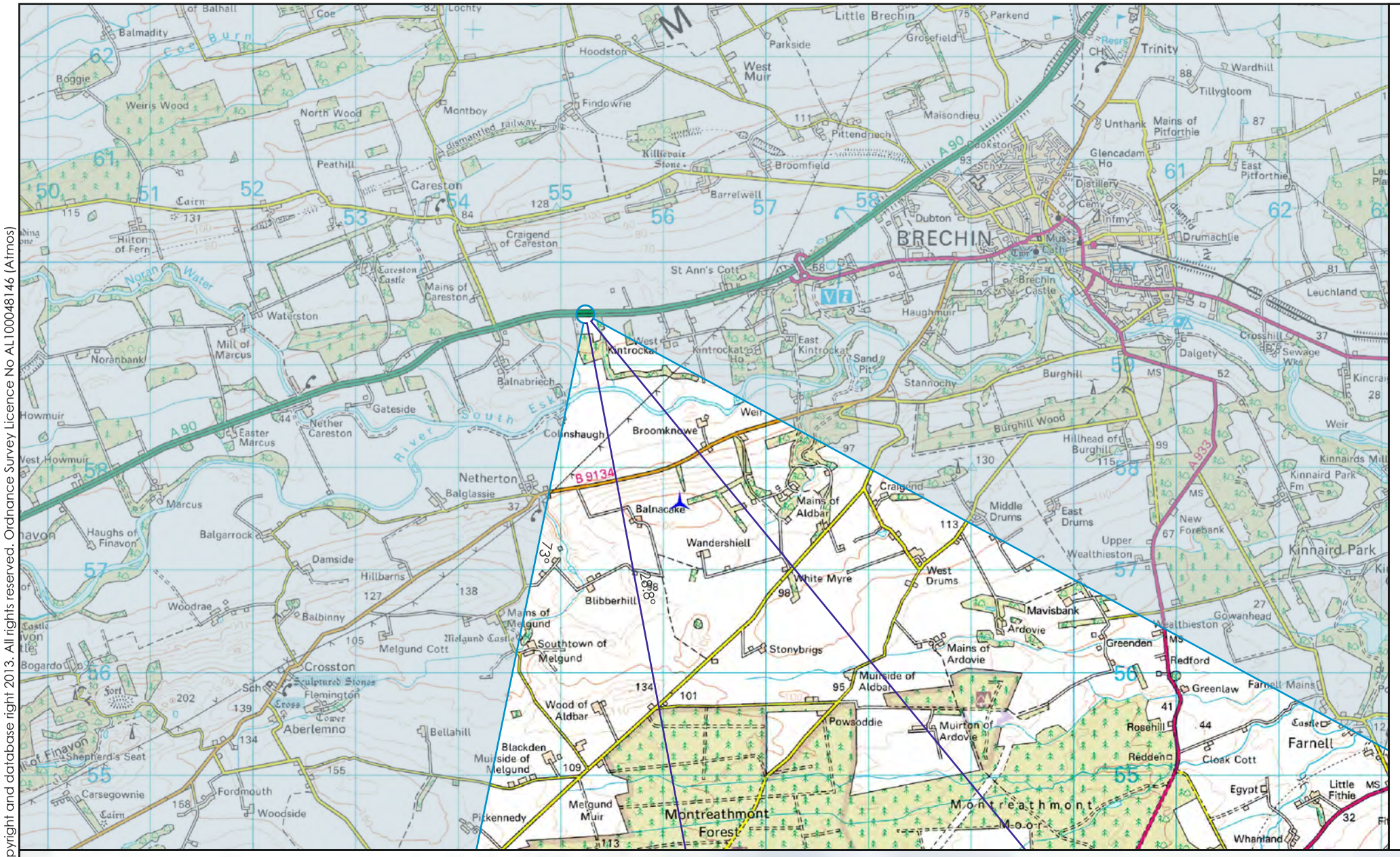
Predicted View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 2: Angus Core Path 64, Burghill Wood	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-6c		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C012b

Predicted View (70mm Focal Length)

atmos CONSULTING	**Polar Energy (Netherton) Ltd**	**Netherton Wind Turbine**	Viewpoint 2: Angus Core Path 64, Burghill Wood	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-6d		Drawn by JM TI01c Checked by TP 10/2/2014 Approved by NT 4611_PM_C012b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

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Figure 5-7a
Viewpoint 3 - A90 southbound

Viewpoint Data	
Grid Reference	E355247, N759491
Elevation	55m AOD
Wireframe/Photograph	
Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens
Proposed Turbine Information (Netherton only)	
Hub Height	40m
Blade Tip Height	67m
Predicted Wireframe Turbine Visibility (Netherton only)	
Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	2,031m

0km 3km
Scale 1:50,000@ A3

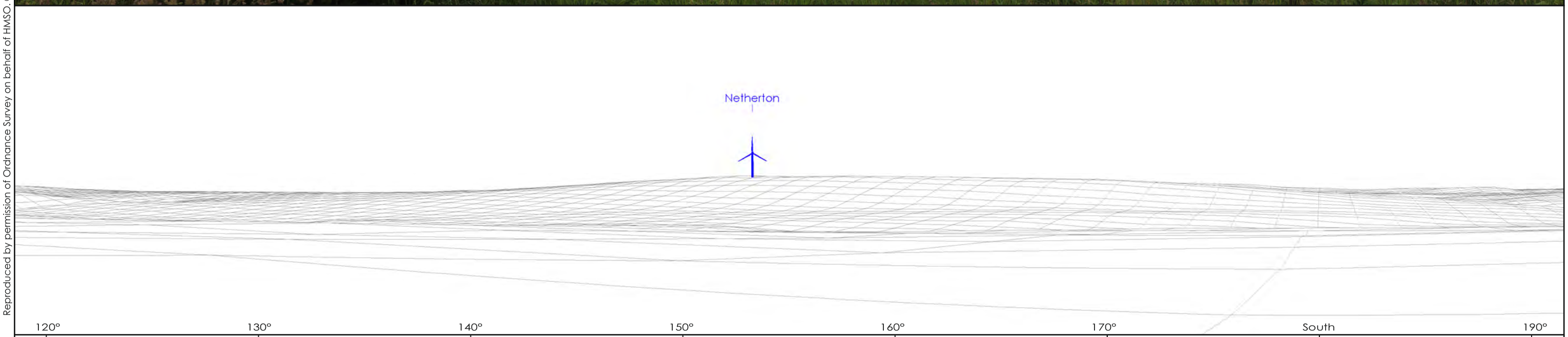
▼ Wide Angle Photo of Existing View Included Angle 110° Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

Drawn by JM
Checked by TP
Approved by NT

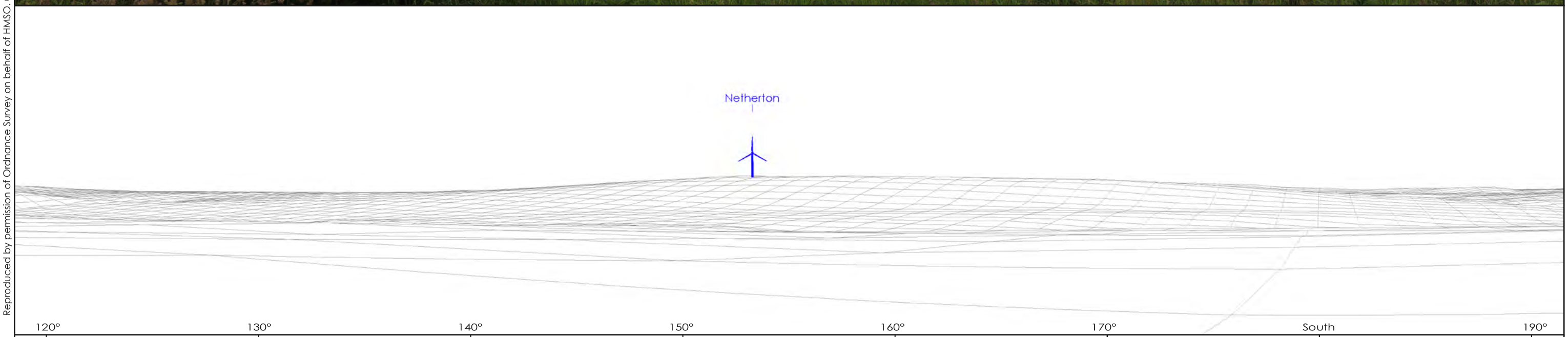
TI01c
10/2/2014
4611_PM_C013b

Existing View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 3: A90 southbound	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-7b		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C013b

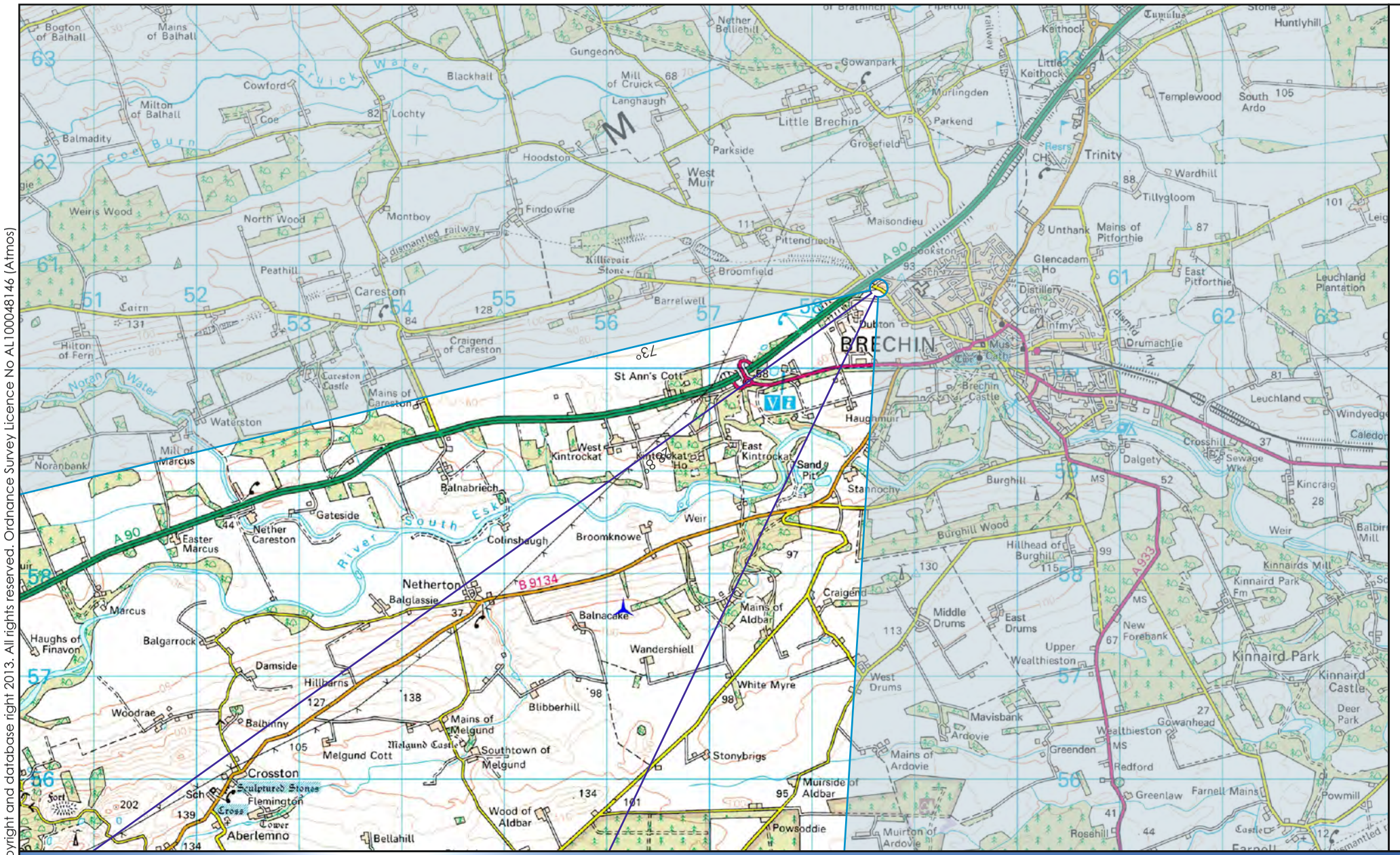
Existing View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 3: A90 southbound	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-7c		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C013b

Predicted View (70mm Focal Length)

atmos CONSULTING	**Polar Energy (Netherton) Ltd**	**Netherton Wind Turbine**	Viewpoint 3: A90 southbound	Horizontal View Angle 28.8° Approximate Viewing Distance 775mm	Figure 5-7d		Drawn by JM Checked by TP Approved by NT TI101c 10/2/2014 4611_PM_C013b



Netherton Wind Turbine

Polar Energy (Netherton) Ltd

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Figure 5-8a
Viewpoint 4 - Brechin - Pittendreich Road

Viewpoint Data

Grid Reference	E358646, N760759
Elevation	79m AOD

Wireframe/Photograph

Height above ground	1.6m
Camera and Lens	Canon 5D SLR with fixed 50mm lens

Proposed Turbine Information (Netherton only)

Hub Height	40m
Blade Tip Height	67m

Predicted Wireframe Turbine Visibility (Netherton only)

Number of Turbine Tips Visible*	1
Number of Turbine Hubs Visible	1
Turbine Distance	3,958m

0km 3km

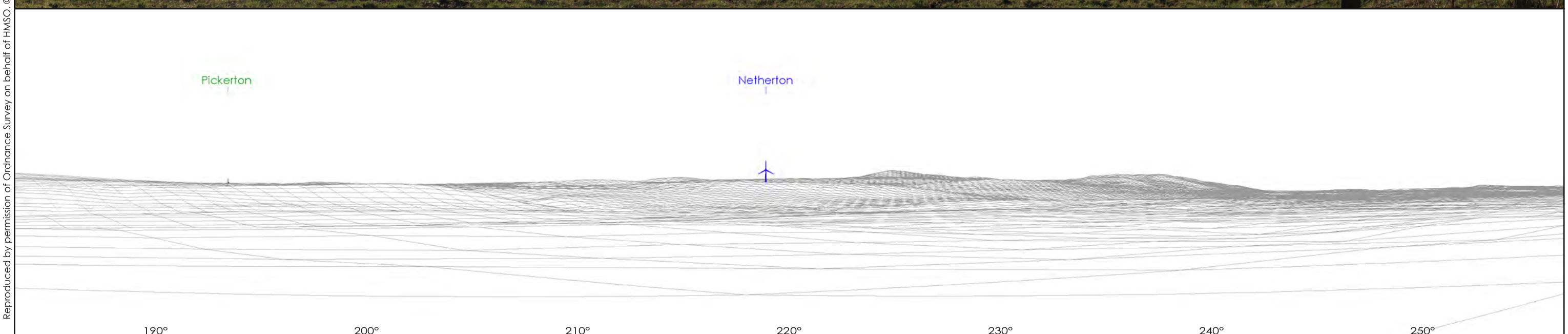
Scale 1:50,000@ A3

▼ Wide Angle Photo of Existing View Included Angle 110° Approximate Viewing Distance 210mm

The following images can only be accurately assessed from the correct Viewing Distance, where the curvature of the earth has been accounted for.
Wireframes are generated using Ordnance Survey's Terrain 50 Dataset which does not take in to account the screening effects of buildings or vegetation.
*Refers to the number of turbines that blade tips can be seen rather than the number of individual tips seen from the viewpoint.

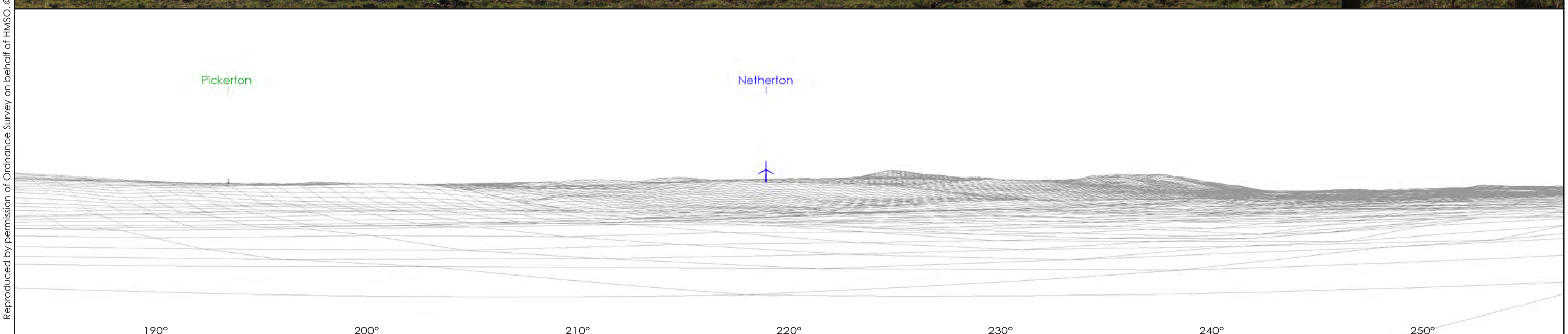
Drawn by	JM
Checked by	TP
Approved by	NT
	TI01c
	10/2/2014
	4611_PM_C014a

Existing View



atmos CONSULTING	Polar Energy (Netherton) Ltd	Netherton Wind Turbine	Viewpoint 4: Brechin - Pittendreich Road	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-8b		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C014a

Predicted View



atmos CONSULTING	**Polar Energy (Netherton) Ltd**	**Netherton Wind Turbine**	Viewpoint 4: Brechin - Pittendreich Road	Horizontal View Angle 73° Approximate Viewing Distance 315mm	Figure 5-8c		Drawn by JM Checked by TP Approved by NT TI01c 10/2/2014 4611_PM_C014a