

TCP/11/16(205)

Planning Application 12/00401/FLL – Erection of a wind turbine and an anemometer mast on land 550 metres south west of Drumick Farm, Glenalmond

**PAPERS SUBMITTED
BY THE
APPLICANT**

PB/CIR.C.0362

23 August 2012

Local Review Body
Perth and Kinross Council
2 High Street
PERTH
PH1 5PH

By email: Planninglr@pkc.gov.uk

Dear Sir/Madam,

Request for Local Review Body Review - TCP/11/16(205)
Refusal of planning permission: 12/00401/FLL
Erection of a wind turbine, Land south west of Drummick Farm,
Glenalmond
Applicant: Clearwinds Limited

Please find enclosed a request for a review by the Perth and Kinross Local review Body of the refusal by an appointed officer of the above application by the decision on 24th May 2012.

The documentation submitted with this Request for a review comprises:

- Completed Notice of Review Form
- Planning Statement on behalf of Applicant
- Landscape and Visual Amenity Statement on behalf of the Applicant

The planning application as originally submitted comprised of the following documents:

- Schedule of application drawings, comprising:
 - Site Location Plan (C.0362_17-D)
 - Site Context Plan (C.0362_03-B)
 - Site Layout Plan (29827/35740.2)
 - Turbine Elevation Plan (29827)
 - Turbine Foundation Plan (29827)
 - Control Building Plan (29827)
 - Mat Mast Elevation Plan (C.0362_22-A)
- Planning Documentation, comprising:
 - 1 Application Form
 - Planning Statement
 - Design & Access Statement

Pegasus House
Querns Business Centre
Cirencester
Gloucestershire
GL7 1RT

T 01285 641717

F 01285 642348

Also at:
Birmingham
Bracknell
Bristol
Cambridge
Leeds
Manchester
Nottingham

Pegasus Planning Group is the trading name of Pegasus Planning Group Limited, registered in England and Wales under number 07277000

Registered Office:
Pegasus House,
Querns Business Centre,
Whitworth Road, Cirencester,
Gloucestershire, GL7 1RT

- Statement of Public Consultation
- Environmental Reports Compendium, comprising:
 - Construction Report
 - Ecology Reports (Phase 1 Habitat Survey, Bat Report & Ornithology Report)
 - Landscape and Visual Impact Assessment Report (including photomontages)
 - Archaeology and Heritage Report
 - Transport and Access Report
 - Noise Report
 - Aviation Report
 - Telecommunications Report

New material has not been specifically raised in preparing the Statements on behalf of the applicant, other than to address a change in circumstances relating to the statutory Development Plan, namely the fact after the decision was made by the appointed officer on 24th May 2012, the Tayside Strategic Development Plan was approved on 8th June, and the 2003 Perth and Kinross Structure Plan was therefore superseded. The reasons for refusal cite policies from the now defunct Structure Plan, so this matter has had to address in the submissions, quite properly. This new matter is addressed in the accompanying Review Statements.

On behalf of the applicant, we have also sought to directly address each of the three reasons for refusal which were clearly not known to the applicant at the time of submission of the application. It is only reasonable that the applicant be allowed to respond to these matters, although new supporting material has not been raised.

We trust this is sufficient to allow the local review process to commence. If you have any queries please do not hesitate to contact either myself or my colleague Sarah Griffiths.

Yours sincerely



Paul Burrell
Director

NOTICE OF REVIEW

UNDER SECTION 43A(8) OF THE TOWN AND COUNTRY 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 2008

THE TOWN AND COUNTRY PLANNING (APPEALS) (SCOTLAND) REGULATIONS 2008

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.

Use BLOCK CAPITALS if completing in manuscript

Applicant(s)

Name

Address

Postcode

Contact Telephone 1

Contact Telephone 2

Fax No

E-mail*

Agent (if any)

Name

Address

Postcode

Contact Telephone 1

Contact Telephone 2

Fax No

E-mail*

Mark this box to confirm all contact should be
through this representative: ☒

* Do you agree to correspondence regarding your review being sent by e-mail?

Yes ☒ No ☐

Planning authority

Planning authority's application reference number

Site address

Description of proposed
development

Date of application

Date of decision (if any)

Note. This notice must be served on the planning authority within three months of the date of the decision
notice or from the date of expiry of the period allowed for determining the application.

Nature of application

- | | |
|--|-------------------------------------|
| 1. Application for planning permission (including householder application) | <input checked="" type="checkbox"/> |
| 2. Application for planning permission in principle | <input type="checkbox"/> |
| 3. 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) | <input type="checkbox"/> |
| 4. Application for approval of matters specified in conditions | <input type="checkbox"/> |

Reasons for seeking review

- | | |
|---|-------------------------------------|
| 1. Refusal of application by appointed officer | <input checked="" type="checkbox"/> |
| 2. Failure by appointed officer to determine the application within the period allowed for determination of the application | <input type="checkbox"/> |
| 3. Conditions imposed on consent by appointed officer | <input type="checkbox"/> |

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.

- | | |
|---|-------------------------------------|
| 1. Further written submissions | <input checked="" type="checkbox"/> |
| 2. One or more hearing sessions | <input type="checkbox"/> |
| 3. Site inspection | <input type="checkbox"/> |
| 4. Assessment of review documents only, with no further procedure | <input type="checkbox"/> |

If you have marked box 1 or 2, 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 are necessary:

REFER TO COVERING LETTER

Site inspection

In the event that the Local Review Body decides to inspect the review site, in your opinion:

- | | | |
|--|-------------------------------------|--------------------------|
| | Yes | No |
| 1. Can the site be viewed entirely from public land? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Is it possible for the site to be accessed safely, and without barriers to entry? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

If there are reasons why you think the Local Review Body would be unable to undertake an unaccompanied site inspection, please explain here:

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.

REFER TO SEPARATE STATEMENT

Have you raised any matters which were not before the appointed officer at the time the determination on your application was made?

Yes ☒ No ☐

If yes, you should explain in the box below, why you are raising new material, why it was not raised with the appointed officer before your application was determined and why you consider it should now be considered in your review.

REFER TO COVERING LETTER

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 and intend to rely on in support of your review.

REFER TO COVERING LETTER

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.

Checklist

Please mark the appropriate boxes to confirm 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 requiring 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 [delete as appropriate] hereby serve notice on the planning authority to review the application as set out on this form and in the supporting documents.

Signed



Date

23/8/2012.

REQUEST FOR REVIEW

**APPEAL AGAINST REFUSAL
OF PLANNING PERMISSION
FOR THE ERECTION OF A WIND TURBINE
AND AN ANOMETER MAST
AT LAND 550 METRES SOUTH WEST OF
DRUMMICK FARM, GLENALMOND**

**PLANNING APPEAL STATEMENT
ON BEHALF OF CLEARWINDS LIMITED**

Pegasus Planning Group
Pegasus House,
Querns Business Centre
Whitworth Road
Cirencester
Glos
GL7 1RT

Telephone: (01285) 641717 Facsimile: (01285) 642348

LPA Ref: 12/00401/FLL
Local Review Body Ref: TCP/11/16(205)
PPG Ref: SG/PB/C.0362

Date: August 2012

COPYRIGHT

The contents of this document must not be copied or reproduced in whole or in part without the written consent of **Pegasus Planning Group Ltd**

CONTENTS:

	Page No:
1. INTRODUCTION	1
2. SITE LOCATION	3
3. THE DEVELOPMENT PROPOSAL	4
4. THE DEVELOPMENT PLAN AND OTHER POLICY CONSIDERATIONS	5
National Planning Policy	5
TayPlan – Strategic Development Plan 2012-2032	9
Strathearn Area Local Plan 2011 (adopted May 2001)	11
Perth & Kinross Council Local Development Plan - Proposed Plan (January 2012)	13
Development Plan policy conclusions	17
5. REASONS FOR REFUSAL	18
Visual Amenity	18
Residential Amenity	19
Undesirable Precedent undermining the relevant Development Plan policies.	19
6. OTHER MATERIAL CONSIDERATIONS	23
Case Officer's Report of Handling	28
7. SUMMARY AND CONCLUSIONS	30

1. INTRODUCTION

1.1 Pegasus Planning Group has been instructed by Clearwinds Limited to submit an appeal to the Local Review Body against the delegated decision of Perth and Kinross Council to refuse planning permission for the **“Erection of a wind turbine and an anemometer mast at land 550 meters south west of Drummick Farm, Glenalmond.”**

1.2 The application was refused 24th May 2012. The reasons for refusal were:

1. **As the proposed turbine will have a significant adverse impact on the visual amenity of the area, which is presently enjoyed by a host of receptors including (but not exclusively) existing residential properties and visiting recreational users, the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (visual) amenity from new developments with the landward area, and Environmental and Resource Policy 14 of the Perth and Kinross Structure Plan 2003 which seeks to protect existing local environmental quality from inappropriate renewable energy developments”.**
2. **As the proposed turbine will potentially have a significant adverse impact on the residential amenity of existing residential properties (by virtue of the turbines appearance and scale when viewed from their properties), the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (residential) amenity from new developments within the landward area”.**
3. **The approval of this proposal would establish an undesirable precedent for similar sized developments within the local area, which would be to the detriment of the overall visual character of the area, and which in turn could potentially undermine (and weaken) the established Development Plan relevant policies.**

-
- 1.3 An accompanying Landscape Appeal Statement has also been produced by Mr Cook of Pegasus Environmental, addressing the technical aspects of the first two reasons for refusal. It specifically addresses landscape and visual issues, and the effect of the proposed development on residential amenity.

2. SITE LOCATION

- 2.1 The full address of the application site is land 550 metres South West of Drummick Farm, Glenalmond.
- 2.2 The proposal site area is approximately 0.8ha and is located in a rural area between Glenalmond approximately 1km to the north and Keilour approximately 2.5km south/south east. Buchanty Burn lies further west from the site area.
- 2.3 The site is currently in agricultural use and does not hold any particular conservation or biodiversity value.
- 2.4 The site is not located within any "sensitive area" as defined by the EIA Regulations:
- There are no Sites of Special Scientific Interest (SSSI) within or adjacent to the site; the closet being Methven Moss over 5km south east, a second SSSI (Connachan Marsh) is 8km south west.
 - There are no National Parks within or close to the site – the nearest being Loch Lomond and The Trossachs National Park over 66km to the west.
 - The site is not within or close to any World Heritage Sites or Scheduled Monuments (SMs). The closest SMs are Fendoch Burn Roman Fort, Sair Law burial mound and Inchaffray Abbey approximately 4km away.
 - The Site is not within a National Scenic Area, the closest being River Tay (Dunkeld) approximately 15km north of the site.
 - There are no Ramsar Sites, Special Protection Areas (SPAs) or Special Areas of Conservation (SAC) (European designations under the Habitats Regulations) within or adjacent to the site. The closest SAC is Methven Moss 5km away. The closest Ramsar Site and SPA is South Tayside Goose Roosts approximately 10km south east.
- 2.5 An unclassified road passes east of the site area in a north – south direction, leading to Drummick.
- 2.6 Existing land use within the site comprises grazing land which is surrounded by pasture land and forestry within the wider area. Overhead cables lie east of the site at a section between Easter Buchanty and Bellour.

3. THE DEVELOPMENT PROPOSAL

- 3.1 The development proposal is for the erection of a single 77m wind turbine.
- 3.2 It is envisaged that the proposed wind turbine would be operational for a duration of 25 years in order to benefit from the Feed-in Tariff (FiT) programme which will see renewable energy fed into the grid as well as consumed on site, thus representing a contribution to the UK's renewable energy targets.
- 3.3 The turbine would have a hub height of 50m, with a maximum height to blade tip from ground level of approximately 77m. The rotor diameter will be 54m, with a blade length of approximately 27m.
- 3.4 The exterior finish of the proposed turbine will be non-reflective matt white/grey as is typical of existing wind turbines throughout the UK.
- 3.5 In addition, it is proposed to erect a 50m anemometer mast for a temporary period of 18 months to record local wind speeds.
- 3.6 Access for construction and maintenance would be from adjoining C classified road south of Drummick Farm and on-site track.

4. THE DEVELOPMENT PLAN AND OTHER POLICY CONSIDERATIONS

- 4.1 Section 25 and 37(2) of the Town and Country Planning (Scotland) Act 1997 (as amended) requires that planning applications are to be determined in accordance with the provisions of the Development Plan, unless material considerations indicate otherwise.
- 4.2 The key planning policy and guidance relating to the proposed development are contained within the following documents:
- i) National Planning Framework for Scotland 2 (June 2009);
 - ii) Scottish Planning Policy (February 2010);
 - iii) TayPlan Strategic Development Plan (June 2012) which has superseded the Perth & Kinross Structure Plan of June 2003 which was referred to in the reasons for refusal;
 - iv) Strathearn Area Local Plan 2011 (May 2001); and the
 - v) Perth & Kinross Local Development Plan (January 2012)

National Planning Policy

National Planning Framework for Scotland 2 (June 2009)

- 4.3 The NPF2 guides Scotland's development to 2030, setting out strategic development priorities to support the Scottish Government's central purpose – sustainable economic growth. The Planning etc. (Scotland) Act 2006 puts this and future iterations of the National Planning Framework on a statutory footing.
- 4.4 The NPF2 states that one of the principal challenges relates to climate change; reducing the greenhouse gas emissions which contribute to it and adapting to changes in our environment which are already becoming apparent. Substantial reductions in greenhouse gas emissions will be necessary to minimise the impacts of climate change. The UK and Scottish Government's are taking an international lead by introducing ambitious statutory emission reduction targets through, respectively, the UK Climate Change Act and the Scottish Climate Change Bill.

- 4.5 Paragraph 26 of the NPF2 continues that tackling climate, reducing dependence on finite fossil fuels and security of energy supply are some of the major global challenges of our time. Addressing these challenges will demand profound changes in the way we produce, distribute and use energy over the coming decades.
- 4.6 The European Union has responded by committing to deriving 20% of the energy it uses from renewable sources by 2020. The NPF confirms that the Scottish Government supports this objective and has in place its own, higher target for electricity generated from renewable sources.
- 4.7 Paragraph 145 confirms that the Scottish Government is fully committed to establishing Scotland as a leading location for the development of renewable energy technology and an energy exporter over the long term.
- 4.8 The development proposal, by generating renewable low-carbon electricity, would assist in contributing towards these national strategic policy objectives.

Scottish Planning Policy (February 2010)

- 4.9 Scottish Planning Policy (SPP) is the statement of the Scottish Government's view on the purpose of planning, setting out core principles and subject planning policies.
- 4.10 The SPP reiterates many of the provisions and objectives as set out within the NPF2, but also provides detailed 'subject policies' to guide certain types of developments. The following subject policies are of particular relevance to the current application before the Council:

a) Rural Development:

- 4.11 Paragraph 92 of the SPP states that the aim of 'rural development' should be to enable development in all rural areas which supports prosperous and sustainable communities whilst protecting and enhancing environmental quality.
- 4.12 Paragraph 93 continues that the strategy for rural development should respond to the respond to the specific circumstances in an area whilst reflecting the overarching aim of supporting diversification and growth of the rural economy. In particular, the SPP also states that developments which provide (amongst other things) community benefits (such as the proposed development) should be encouraged.

b) Landscape and Natural Heritage

- 4.13 The SPP states that Planning Authorities should take a broader approach to landscape and natural heritage than just conserving designated or protected sites and species, taking into account the ecosystems and natural processes in their area. A strategic approach to natural heritage in which wildlife sites and corridors, landscape features, watercourses, and areas of open space are linked together in integrated habitat networks can make an important contribution to the maintenance and enhancement of biodiversity and to allowing ecosystems and natural processes to adapt and respond to changes in climate. Planning Authorities should seek to prevent further fragmentation or isolation of habitats and identify opportunities to restore links which have been broken. Where possible, planning authorities should seek benefits for species and habitats from new development including the restoration of degraded habitats.
- 4.14 The SPP continues that different landscape will have a different capacity to accommodate new development, and the siting and design of development should be informed by local landscape character. Landscape and the natural heritage are sensitive to inappropriate development and planning authorities should ensure that potential effects, including the cumulative effects of incremental changes are considered when preparing development plans and deciding planning applications.
- 4.15 While the protection of the landscape and natural heritage may sometimes impose constraints on development, with careful planning and design the potential for conflict can be minimised and the potential for enhancement maximised. However, there will be occasions where the sensitivity of the site or the nature or scale of the proposed development is such that the development should not be permitted. Statutory natural heritage designations are important considerations where they are directly or indirectly affected by a development proposal. However, designation does not necessarily imply a prohibition on development.
- 4.16 It is therefore important to reiterate that the proposed development does not lie within an area designated for its landscape or ecological value and as such is considered to be a more suitable site to support such development, particular as this development is supported by necessary assessments and surveys to overcome any uncertainty or constraints.
- 4.17 With regard to the presence of protected species, the SPP states that many species are legally protected and their presence or potential presence is an important

consideration in decisions on planning applications. Although their presence rarely imposed an absolute block on development, mitigation measures are often needed and the layout, design and timing of works may be affected. If there is evidence to suggest that a protected species is present on site or may be affected by a proposed development, their presence must be established, the requirements of the species factored into the planning and design of the development and any likely impact of the species fully considered prior to the determination of the planning application.

c) Renewable Energy:

- 4.18 The SPP confirms that the commitment to increase the amount of electricity generated from renewable sources is a vital part of the response to climate change. Renewable energy generation will contribute to more secure and diverse energy supplies and support sustainable economic growth. The current target is for 50% of Scotland's electricity to be generated from renewable sources by 2020 and 11% of heat demand to be met from renewable sources.
- 4.19 The SPP states that Planning Authorities should support the development of a diverse range of renewable energy technologies, guide development to appropriate locations and provide clarity on the issues that will be taken into account when specific proposals are assessed. Factors relevant to the consideration of applications will depend on the scale of the development and its relationship with the surrounding area, but are likely to include impact on the landscape, historic environment, natural heritage and water environment, amenity and communities, and any cumulative impacts that are likely to arise.
- 4.20 Specifically in relation to proposed wind turbines the SPP states that Planning Authorities should support the development of wind turbines/farms in locations where the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed. Development Plans should provide a clear indication of the potential, for development of wind farms of all scales, and should set out the criteria that will be considered in deciding applications for all wind farm developments. The criteria will vary depending on the scale of development and its relationship to the characteristics of the surrounding area, but are likely to include:
- Landscape and visual impact;
 - Effects on the natural heritage and historic environment;

- Contribution of the development to renewable energy generation targets;
- Effect on the local and national economy and tourism and recreation interests;
- Benefits and disbenefits for communities;
- Aviation and telecommunications;
- Noise and shadow flicker;
- Cumulative impact

4.21 Paragraph 188 continues that the design and location of any wind farm development should reflect the scale and character of the landscape. The location of turbines should be considered carefully to ensure that the landscape and visual impact is minimised.

TayPlan – Strategic Development Plan 2012-2032

4.22 In June 2012 (after the decision notice on this application was issued), the previously adopted Perth and Kinross Structure Plan (2003) was superseded by the new TayPlan Strategic Development Plan. These higher level plans provide a broad strategic land use planning guidance.

4.23 The new Tayplan contains Policy 6 which requires that Local Development Plans should identify areas that are suitable for different forms of electricity infrastructure. It also requires that decisions on development proposals for energy should consider:

- Specific land take requirements
- Proximity of resources and to users/customers, grid connections
- Anticipated effects of construction and operation
- Sensitivity of landscapes
- Impacts of associated new grid connections
- Cumulative impacts

- 4.24 Although now superseded, but of relevance only in the context of the making of the earlier decision in May 2012, the planning policies which were relevant in the 2003 Perth and Kinross Structure Plan to the development proposals were as follows:

Strategy 2: The Lowland Area

- 4.25 The strategy encourages, amongst other things, the economic use of minerals, renewable energy and forestry in support of rural diversification.

Environment and Resources Policy 1

- 4.26 The Council will seek to safeguard the long-term diversity and sustainability of species and natural and semi-natural habitats in Perth and Kinross.

Environment and Resources Policy 3

- 4.27 Proposed developments should not compromise the conservation objectives and overall integrity of National Scenic Areas unless there is a proven public interest where social or economic considerations outweigh the scenic quality and integrity of the area and development cannot be met in other less damaging locations.

Environment and Resources Policy 14

- 4.28 The policy states that Proposals for the development of renewable energy schemes will be supported where they are considered environmentally acceptable and where their energy contribution and benefits in reducing pollution outweigh any significant adverse effects on local environmental quality. Community based renewable energy developments in particular will be encouraged. Proposals for renewable energy schemes will be assessed against the following criteria:

- The immediate and wider impact of the proposed development on the landscape and wildlife resource;
- The need to protect features and areas of natural, cultural, historical and archaeological interest;
- The specific benefits that the proposal would bring to the local community and/or Perth and Kinross;
- The cumulative effects of similar developments on the local area.

4.29 It must be emphasised again that the above 2003 Structure Plan policies have now been superceded and are no longer a material consideration in the determination of this development proposal.

4.30 In considering the development scheme proposals against these more strategic policies, the officer concluded in the 'Report of Handling Delegation Report' that there were 4 key issues. These key issues are returned to later in this Appeal Statement.

Strathearn Area Local Plan 2011 (adopted May 2001)

4.31 The Strathearn Area Local Plan 2011 currently forms part of the Development Plan (and will continue to do so until the Local Development Plan supersedes the 6 Local Plans which apply in the Perth and Kinross Area. However, the adoption of the new Local Development Plan is not expected until end of 2014). The current Strathearn Area Local Plan policies which relate to the proposal are as follows:

Policy 1 (Sustainable Development)

4.32 The Council seeks to ensure that development within the Plan area is carried out in a manner in keeping with the goal of sustainable development. Where development is considered to be incompatible with the pursuit of sustainable development, but has other benefits to the area which outweigh this issue, the developer will be required to take whatever mitigation measures are deemed both practical and necessary to minimise any adverse impact. The following principles are used as guidelines in assessing whether projects pursue a commitment to sustainable development:

- a) The consumption of non-renewable resources should be at levels that do not restrict the options for future generations;
- b) Renewable resources should be used at rates that allow their natural replenishment;
- c) The quality of the natural environment should be maintained or improved;
- d) Where there is great complexity or there are unclear effects of development on the environment, the precautionary principle should be applied;
- e) The costs and benefits (material and non-material) of any development should be equitably distributed;
- f) Biodiversity is conserved;
- g) The production of all types of waste should be minimised thereby minimising levels of pollution;

- h) New development should meet local needs and enhance access to employment, facilities, services and goods.

Policy 2 (Development Criteria)

4.33 Policy 2 states that all developments will also be judged against the following criteria:

- The sites should have a landscape framework capable of absorbing or, if necessary, screening the development and where required opportunities for landscape enhancement will be sought;
- In the case of built development, regard should be had to the scale, form, colour, and density of existing development within the locality;
- The development should be compatible with its surroundings in land use terms and should not result in a significant loss of amenity to the local community;
- The road network should be capable of absorbing the additional traffic generated by the development and a satisfactory access onto that network provided;
- The site should be large enough to accommodate the development satisfactorily in site planning terms;

Policy 3 (Landscape)

4.34 Development proposals should seek to conserve landscape features and sense of local identity, and strengthen and enhance landscape character. The Council will assess development that is viewed as having a significant landscape impact against the principles of the Tayside Landscape Character Assessment produced by Scottish Natural Heritage

Policy 11 (Renewable Energy)

4.35 The Council encourages, in appropriate locations, renewable energy projects. Such developments, including ancillary transmission lines and access roads, are assessed against the following criteria:

- a) The development will not have a significant detrimental effect on sites recognised by designation at a national, regional or local level, of nature conservation interest or sites of archaeological interest;
- b) The development will not result in an unacceptable intrusion into the landscape character of the area;

- c) The development will not result in an unacceptable loss of amenity to neighbouring occupiers by reasons of noise emission, visual dominance, electromagnetic disturbance or reflected light.

Developers are required to enter into an agreement for the removal of the development and the restoration of the site following the completion of the development's useful life.

Policy 17 (Habitats)

- 4.36 Policy 17 states that the Council will seek to protect and enhance habitats of local importance to nature conservation, including grasslands, wetlands and peat-lands, habitats that support rare or endangered species, together with those habitats associated within the Earn and Almond river systems in the Plan area.

Perth & Kinross Council Local Development Plan - Proposed Plan (January 2012)

- 4.37 Once adopted, the Perth & Kinross Council Local Development Plan will provide the local planning authority's vision and land use framework for development in the area. It is still an emerging plan which may be subject to modification and will be subject to an Examination prior to its eventual adoption which is expected by the end of 2014. It is therefore a material consideration at this stage of limited weight. Those policies of relevance to the determination of this application are as follows:

Policy PM1: Placemaking

- 4.38 The policy states that development must contribute positively, to the quality of the surrounding built and natural environment. All development should be planned and designed with reference to climate change, mitigation and adaptation.

Policy PM2: Design Statements

- 4.39 The policy states that Design Statements will normally need to accompany a planning application if the development covers an area greater than 0.5 hectares, or affects the character and/or appearance of a Conservation Area, Historic Garden, Designed Landscape, or the setting of a Listed Building or Scheduled Monument.

Policy NE1D: European Protected Species

4.40 Planning permission will not be granted for development that would, either individually or cumulatively, be likely to have an adverse effect on European protected species unless the Council as Planning Authority is satisfied that:

- a) There is no satisfactory alternative; and
- b) The development is required for preserving public health or public safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.

4.41 In no circumstances can a development be approved which would be detrimental to the maintenance of the population of a European protected species at a favourable conservation status in its natural range.

4.42 Planning permission will also not be granted for development that would be likely to have an adverse effect on species protected under the Wildlife and Countryside Act 1981 (as amended) unless the Council as Planning Authority is satisfied that:

- c) The development is required for preserving public health or safety, and, in the case of development affecting a species of protected bird;
- d) There is no other satisfactory solution.

Policy ER1A: Renewable and Low Carbon Energy Generation (New Proposals)

4.43 Proposals for the utilisation, distribution and development of renewable and low carbon sources of energy, including large-scale freestanding installations, will be supported where they are well related to the resources that are needed for their operation. In assessing such proposals the following factors will be considered:

- a) The individual or cumulative effects on biodiversity, landscape character, visual integrity, the historic environment, cultural heritage, tranquil qualities, wilderness qualities, water resources and the residential amenity of the surrounding area;
- b) The contribution of the proposed development towards meeting carbon reduction targets;
- c) The connection to the electricity distribution or transmission system;

- d) The transport implications, and in particular the scale and nature of traffic likely to be generated, and its implications for site access, road capacity, road safety, and the environment generally.
- e) The hill tracks and borrow pits associated with any development;
- f) The effects on carbon rich soils;
- g) Any positive or negative effects they may have on the local or Perth & Kinross economy either individually or cumulatively;
- h) The reasons why the favoured choice over other alternative sites has been selected.

Policy ER6: Managing Future Landscape Change to Conserve and Enhance the Diversity and Quality of the Area's Landscapes

4.44 Development and land use should be compatible with the distinctive characteristics and features of Perth & Kinross's landscapes. Accordingly, development proposals will be required to conserve and enhance the landscape qualities of Perth & Kinross. They will need to demonstrate that either in the case of individual developments, or when cumulatively considered alongside other existing or proposed developments;

- a) They do not erode local distinctiveness, diversity and quality of Perth & Kinross's landscape character areas, the historic and cultural dimension of the area's landscapes, visual and scenic qualities of the landscape, or the quality of landscape experience;
- b) They safeguard views, viewpoints and landmarks from development that would detract from their visual integrity, identity or scenic quality;
- c) They safeguard the tranquil qualities of the area's landscapes;
- d) They safeguard the relative wildness of the area's landscapes;
- e) They provide high quality standards in landscape design, including landscape enhancement and mitigation schemes when there is an associated impact on a landscape's qualities;

- f) They incorporate measures for protecting and enhancing the ecological, geological or geomorphological, archaeological, historic, cultural and visual amenity elements of the landscape, and
- g) They conserve the experience of the night sky in less developed areas of Perth & Kinross through design solutions with low light impact.

Policy EP8: Noise Pollution

- 4.45 There will be a presumption against the siting of development proposals which will generate high levels of noise in the locality of existing or proposed noise sensitive land uses and similarly against the locating of noise sensitive uses near to sources of noise generation.

Supplementary Planning Guidance

Energy Proposals in Perth & Kinross SPG (May 2005)

- 4.46 This SPG provides additional guidance for applicants and the Council in developing and determining proposals for renewable energy generation. In particular the SPG provides advice in relation to:
- *Landscape Impact;*
 - *Visual Impact;*
 - *Cumulative Effects;*
 - *Biodiversity and Ornithological Interests;*
 - *Operational Impacts;*
 - *Water Resources;*
 - *Aviation Interests;*
 - *Decommissioning and Site Re-instatement*
- 4.47 This SPG establishes under Wind Energy Policy 1 that the Council will encourage the development of commercial wind energy schemes....as shown in Diagram 1.
- 4.48 Diagram 1 confirms that the application site is not within in a Sensitive Area but is within a Broad Area of Search.

- 4.49 Wind Energy Policy 2 states that in the Broad Areas of Search commercial wind energy developments will be supported where they would be consistent with the Council's detailed policy guidelines and it has been demonstrated that they utilise turbines of a size and a scale appropriate to their location, are in locations least damaging to settlements, landscape character, visual amenity, habitats and will not have unacceptable cumulative impacts.

Development Plan policy conclusions

- 4.50 The relevant Development Plan policy criteria have been carefully assessed and it is submitted that the application proposals fulfil these requirements.
- 4.51 The only two criteria which are in contention with the Council's Delegation Officer are in respect of landscape character and visual amenity, which are the first and second reasons for refusal respectively, and which are addressed in the following section.

5. REASONS FOR REFUSAL

5.1 The application was dealt with under delegated powers. The case officer refused the application 24th May 2012 giving three reasons for refusal.

5.2 The decision notice provided the following three detailed reason for refusal:

- 1. As the proposed turbine will have a significant adverse impact on the visual amenity of the area, which is presently enjoyed by a host of receptors including (but not exclusively) existing residential properties and visiting recreational users, the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (visual) amenity from new developments within the landward area, and Environmental and Resource Policy 14 of the Perth and Kinross Structure Plan 2003 which seeks to protect existing local environmental quality from inappropriate renewable energy developments.**
- 2. As the proposed turbine will potentially have a significant adverse impact on the residential amenity of existing residential properties (by virtue of the turbines appearance and scale when viewed from their properties), the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (residential) amenity from new developments within the landward area.**
- 3. The approval of this proposal would establish an undesirable precedent for similar sized developments within the local area, which would be to the detriment of the overall visual character of the area, and which in turn could potentially undermine (and weaken) the established Development Plan relevant policies.**

5.3 The accompanying Landscape Appeal Statement provides a robust and extensive case in response to the first and second reason for refusal which relate to the adverse impact on visual amenity of the area and residential amenity of existing properties.

5.4 The third reason for refusal relates to the potential of the proposal establishing an undesirable precedent and undermining the relevant Development Plan policies if the proposal were to be approved. This reason for refusal is addressed only in this Statement.

Visual Amenity

5.5 This first reason for refusal is addressed in detail in the accompanying Landscape Statement.

- 5.6 In summary, whilst it is inevitable the wind turbine would have *some* effect on the landscape, Mr Cook in his Statement concludes that he does not consider that the development will give rise to any *unacceptable* visual effects on the local and wider landscape within which it is located.
- 5.7 The proposed wind turbine would be located in a working and settled agricultural landscape, punctuated with development and transport infrastructure. Its overriding character remains one of a rural landscape. The experience by members of the public of the area's visual amenity would not materially change with the proposed turbine in place.

Residential Amenity

- 5.8 This second reason for refusal is also addressed in detail in the accompanying Landscape Statement.
- 5.9 In summary, there are no sizeable settlements in the immediate vicinity of the site, although there are the villages of Methven and Glenalmond, together with a number of individual and isolated properties which punctuate the landscape situated nearby. The detailed visual analysis has demonstrated that the proposed turbine would be located at an appropriate distance to ensure that the proposed turbine would not have an overbearing or overwhelming effect upon the residential visual amenity of nearby properties (or their occupants). With the wind turbine in place, it would not render these properties unattractive as places in which to live, when assessed objectively and in the public interest.

Undesirable Precedent undermining the relevant Development Plan policies.

- 5.10 The third reason for refusal relates to potential of the proposal setting an undesirable precedent for other similar sized developments which would be to the detriment of the visual character of the area and undermine the relevant Development Plan policies.
- 5.11 Sections 25 and 37(2) of the Town and Country Planning (Scotland) Act 1997 is the principal legislation which instructs Local Planning Authorities (LPAs) how to make planning decisions.
- 5.12 Section 25 (Status of Development Plans) states:

“Where, in making any determination under the planning Acts, regard is to be had to the development plan, the determination shall be made in accordance with the plan unless material considerations indicate otherwise.”

5.13 Section 37 (Determination of applications: general consideration) states

“(1) Where an application is made to a planning authority for planning permission—

(a) subject to sections 58 and 59, they may grant planning permission, either unconditionally or subject to such conditions as they think fit, or

(b) they may refuse planning permission.

(2) In dealing with such an application the authority shall have regard to the provisions of the development plan, so far as material to the application, and to any other material considerations.”

5.14 The statutory duty to decide each application in accordance with the development plan, unless material consideration indicates otherwise, is intended to underpin a plan-led system designed to secure greater consistency. However, this consistency is against development plan policies, not specific development proposals which may have been consented due to their particular site specific circumstances.

5.15 Through several appeals and court cases it has been accepted that the use of precedent can be a material consideration most specifically where it is likely that similar proposals in closely parallel situations could not be resisted and cumulatively result in harm to planning policy. So, for example, if a rear extension to a property in a terrace is permitted other householders in the terrace may want similar extensions and given the circumstances being the same the local authority should be consistent with their approach with any consideration of similar future proposal. In such a circumstance a Planning Authority would need to carefully consider the potential of creating a precedent, particularly when making a decision conflicting with established policy due to the fact that there are identical situations which may arise.

5.16 The strength of the “precedent” argument is however reduced where the circumstances are unlikely to be replicated and/or where policies exist which require treating each proposal on its own merits.

5.17 The granting of permission in this case would not create a precedent for similar wind turbine development as each turbine proposal would need to be very carefully considered on its own merits having full regard to the very specific site and

surrounding circumstances which cannot be replicated elsewhere given the differing nature and characteristics of the countryside.

5.18 Indeed, the specific characteristics of a wind turbine proposal have the potential to vary significantly and materially from site to site, or even at a micro scale within a site, depending upon:

- The visibility of the turbine in the wider landscape in relation to contextual features, both natural and manmade, its visibility from key viewpoints and well used public access routes and roads;
- The visibility an impact upon setting of heritage assets, where views can be affected by locating a turbine inside or outside a particular field of view and the presence or otherwise of inventing topography, vegetation or structures;
- The impact upon local ecological interests and wildlife. Even a few metres difference at a local level can make a material difference in relation to disturbance to bat flight paths, for example;
- Impact upon residential amenity, whereby the orientation of a dwellinghouse's windows and views from habitable rooms, shadow flicker etc will be very different from site to site, or even in considering relocating a turbine within a particular field. It cannot be said that two turbines, even of the same size, would have the same residential impact at differing sites due to the variation in intervisibility between the house and the turbine, the orientation of the house, the distance between the property and the turbine, the intervening vegetation, the intervening topography and difference in levels, the use of the rooms in the house, the amount and type and function of fenestration etc;
- Grid connection and access track works will vary on a site-by-site basis;
- Background noise levels can vary considerably;
- Aviation and interference with radar can vary considerably; and
- Interference with wireless telecommunications can vary considerably.

5.19 All of these valid planning considerations will mean that each site, (or even a different application for a wind turbine within the same field but in a slightly different location), will need to be carefully evaluated and appraised on a case-by-case basis. There can be no proper application of a precedent argument when there are so many different, valid but highly variable material planning considerations to apply and appraise for each scheme.

5.20 It is noted that the failure to be able to apply precedent in the case of wind turbines was supported by an Inspector in England in the Lincolnshire Fens, where construction of eight wind turbines and associated infrastructure were proposed. The

Inspector made it clear that allowing the appeal would not create a precedent because each site differed and any cumulative impact would be a material consideration, see South Holland 19/05/2003 DCS No 051-066-170.

- 5.21 The LPA's stated concern that their decision may be used in the future on other similar scaled development is not supported with any evidence. A judge stated in the case of Poundstretcher Ltd v SoS and Liverpool City Council 10/06/1988 "*where precedent was relied on, mere fear and generalised concern was not enough. There had to be evidence in one form or another in order to support an objection on the grounds precedent*".
- 5.22 The third reason for refusal which is based on the allegation that an undesirable precedent would be created is therefore invalid due to differing particular characteristics of each site and its setting which means that each wind turbine proposal must be very carefully assessed on its own individual merits and effects.

6. OTHER MATERIAL CONSIDERATIONS

- 6.1 This section examines the various material considerations which will assist in determining the acceptability of the current Appeal proposals.

Global Warming and Climate Change

- 6.2 Many analyses of the climate change problem, now including the UN Climate Change Conference in Bali (December 2007) and Cancun (December 2010) and the Stern Review (2006), have underlined the need to act now to reduce carbon emissions. Renewable energy is one of the few supply-side options that can make a major difference to emissions in the short term in the UK.

The Stern Review – Financial Implications of Global Warming

- 6.3 The government-commissioned Stern Review into the financial impact of global warming was published in October 2006 and made hard-hitting statements about the human, environmental and economic costs of climate change.
- 6.4 Sir Nicholas Stern, a former World Bank economist, said in his 700-page report that industrial countries cannot afford not to take action on climate change. He warned that dealing with the floods, storms and rising sea levels caused by global warming could plunge the world into an economic crisis similar to the Great Depression in the 1930's. He said that although dealing with climate change could cost one per cent of world GDP, not doing anything could cost 20 times more. The Report states:

“Delaying action, even by a decade or two, will take us into dangerous territory. We must not let this window of opportunity close. There is still time to avoid the worst impacts of climate change, if we act now and act internationally. Governments, businesses and individuals all need to work together to respond to the challenge. Strong, deliberate policy choices by governments are essential to motivate change.”

- 6.5 This message from Stern has been welcomed across the political spectrum.
- 6.6 Indeed following the Climate talks at Cancun, Mexico (December 2010) the Climate Change Minister Chris Huhne said in a ministerial speech to parliament that “a *global*

climate deal is in the UK's national interest and Cancun shows other countries also want to get on with getting an international deal". He continued that, "expectations have been exceeded and a global deal on climate change is now back on track. We've got to use this momentum to make urgent progress and lock down that deal – a deal that will benefit our environment and our economies".

- 6.7 Following on from Chris Huhne's speech, the Climate Change Minister (Greg Barker) added:

"Cancun will send a strong signal of confidence to business investing billions in the new global green economy. British companies are poised to reap the huge advantage of being the first movers in this rapidly expanding market. We will be working in partnership with the private sector to drive home that opportunity."

- 6.8 As such it can be seen that the focus on climate change, its causes and solutions, is very much a political heavyweight issue with significant steps being made towards its resolution. This momentum now needs to be transferred into practice with the promotion and development of renewable energy schemes at the local level.

European Energy Policy

- 6.9 At a European level, there is the agreed commitment to reduce carbon emissions by 20% by 2020, compared to 1990 levels. Following the Energy Review Report in 2006, the European Council agreed to a European strategy to further improve energy security and to reduce carbon emissions. In March 2007, it was agreed to commit to:

- Saving 20% of the EU's energy consumption by 2020 compared to current projections; and
- A binding target of reducing carbon emissions by 20% by 2020 and by 30% in the context of international action.

- 6.10 The European Commission published the 20 20 by 2020 package in January 2008 and the EU Climate and Energy package was formally agreed in April 2009. This package commits the European Union (EU) to the 20% reduction in its carbon

emissions and to achieving a target of deriving 20% of the EU's final energy consumption from renewable sources by 2020.

- 6.11 The renewables target is confirmed in the Commission's Directive on the promotion of the use of energy from renewable sources. In order to achieve the overall EU renewable energy target of 20% the proposal includes individual targets for each Member State. The UK's legally binding obligation is 15% of energy coming from renewable sources by 2020.

UK Energy Policy - Energy White Paper (2007)

- 6.12 Published in May 2007 "*Meeting the Challenge – The Energy White Paper*" establishes the government's energy strategy for the foreseeable future. The document builds on the themes and issues raised in the Energy Review. A clear statement of Government policy, the strategy set down in this document contains a number of key elements of relevance to the consideration of this planning application. Section 5.3 of the White Paper addresses policy on renewables and starts with a simple statement.

"Renewable energy has a key role to play in reducing carbon emissions and achieving security of supply."

- 6.13 The White Paper recognises the progress which renewable energy has made to reducing emissions but goes on to address directly the barriers that it notes are slowing the rate of renewable deployment in the UK in both the short and long term. Under the heading of 'planning' the White Paper sets down how the government expects the planning system to respond. In relation to commercial wind energy developments the government's actions are as follows:
- Underlining that applicants will no longer have to demonstrate either the overall need for renewable energy or for their particular proposal to be sited in a particular location; and
 - Giving a clear steer to planning professionals and local authority decision makers, that in considering applications they should look favourably on renewable energy developments.

- 6.14 The White Paper goes on to place into policy the “Statement of Need” previously published in the energy review. The statement states:

“We remain committed to the important role renewables has to play in helping the UK meet its energy policy goals. In this publication we are reiterating previous commitments we have made, not least in the 2003 Energy White Paper on the importance of renewable generation and the supporting infrastructure. We intend this to reconfirm the UK Government policy context for planning and consent decisions on renewable generation projects. As highlighted in the July 2006 Energy Review Report 150, the UK faces difficult challenges in meeting its energy policy goals. Renewable energy as a source of low carbon, indigenous electricity generation is central to reducing emissions and maintaining the reliability of our energy supplies at a time when our indigenous reserves of fossil fuels are declining more rapidly than expected. A regulatory environment that enables the development of appropriately sited renewable projects, and allows the UK to realise its extensive renewable resources, is vital if we are to make real progress towards our challenging goals.

New renewable projects may not always appear to convey any particular local benefit, but they provide crucial national benefits. Individual renewable projects are part of a growing proportion of low carbon generation that provides benefits shared by all communities both through reduced emissions and more diverse supplies of energy, which helps the reliability of our supplies. This factor is a material consideration to which all participants in the planning system should give significant weight, when considering renewable proposals. These wider benefits are not always immediately visible to the specific locality in which the project is sited. However, the benefits to society and the wider economy as a whole are significant and this must be reflected in the weight

given to these considerations by decision makers in reaching their decisions.

If we are to maintain a rigorous planning system that does not disincentivise investment in renewable generation, it must also enable decisions to be taken in reasonable time. Decision makers should ensure that planning applications for renewable energy development are dealt with expeditiously while addressing the relevant issues.

- 6.15 The Scottish Government is committed to promoting the increased use of renewable energy sources. This commitment recognises renewables potential to support economic growth. It also provides new opportunities to enhance our manufacturing capacity and to provide new employment, not least in the remote and rural areas. This Government has set clear targets for renewable electricity. **The First Minister wants renewable sources to generate the equivalent of 100 per cent of Scotland's gross annual electricity consumption by 2020. Similarly, a target has been set for renewables sources to provide the equivalent of 11 per cent of Scotland's heat demand by 2020.**
- 6.16 The Government wants targets to be exceeded rather than merely met, and not to be viewed as a cap on what renewables can deliver. It is important that momentum towards the 2020 target and beyond is maintained. This will require many more technologies to start playing a major role - for example, marine energy and biomass energy. The 2020 Routemap for Renewable Energy in Scotland presents actions which are focussed on targets, within the current development of UK regulatory support, arguing constructively for the UK Government to ensure that such support matches Scotland's ambitions.
- 6.17 The main driver behind renewable electricity development in Scotland, now and over the coming years, is the Renewables Obligation (Scotland), or ROS. This mechanism places an obligation on electricity suppliers to provide an increasing amount of their electricity supplied from eligible renewable sources. The targets should be met by as wide a range of renewable sources as possible.

Case Officer's Report of Handling

- 6.18 The Case Officer's Report of Handling covers all those issues considered pertinent to the application/appeal.
- 6.19 Those matters which were considered acceptable by the Officer and not rejected as part of the reasons for refusal are recounted below. They relate to a number of technical matters which add weight to the acceptability of the proposals.

Cumulative Impact

- 6.20 The Case Officer shares the view that the proposed turbine would not have a significant cumulative impact in relation to 6 wireframes, namely Burnfoot Wind Farm, Green Knowes Wind Farm, Lochelbank Wind Farm, Griffin Wind Farm, Stewart Tower and Calliacher given the distances between the developments and location of the proposals.

Compatibility with Existing land uses

- 6.21 The Case Officer stated

"I have no concerns regarding the impact that the turbine will have on commercial activities on land, and in terms of the impacts on any residential property is approx 500m from the site"

Protected Species/Habitats

- 6.22 An assessment was carried out on the potential impact on wildlife and the case officer was satisfied this had been carried out adequately and considered the proposal was consistent with the Development Plan Policies

Cultural Heritage

- 6.23 There are a number of cultural heritage sites with a wide proximity of the site however it was considered by the officer assessing the application that the proposal was unlikely to have any significant impact on those surrounding cultural sites and therefore consistent with the relevant development plan policies.

Shadow Flicker

- 6.24 Shadow Flicker is the casting of a shadow over neighbouring properties caused by the rotating blades of the turbine. With the closest residential proximity approximately 500m away it was considered not to be any notable effects on residential amenity in relation to shadow flicker.

Aviation Lighting

- 6.25 The MOD were consulted during the application and advised they had no objections to proposal but requested further information if planning permission were to be given.

Noise

- 6.26 A Noise Assessment was submitted to the Council alongside the planning application submission. The Council's Environmental Health Officer has advised the predicted levels of noise from the proposed turbine would not unduly impact on the nearest neighbouring properties.

Road/Access Issues

- 6.27 An assessment of the existing road infrastructure and identified proposed access route for the delivery of the turbine and associated construction traffic accompanied the original planning application submission, along with a Traffic Report identifying a number of road widening works which would need to be carried out. The Council's Road Engineers reviewed the submitted information and advised that proposed route appeared to be acceptable and although there would be an increase in HGV movements through the construction phase it was accepted that overall increase should not unduly impact on traffic safety.

7. SUMMARY AND CONCLUSIONS

- 7.1 The Appeal is against the decision of Perth and Kinross Council to refuse planning permission for the erection of a wind turbine and an anemometer mast at land 550 metres South West of Drummick Farm, Glenalmond.
- 7.2 The relevant policies of the Development Plan have been considered and the three reasons for refusal rebutted.
- 7.3 The first and second reasons for refusal concerning impacts on the visual and the residential amenity of the proposed development has been investigated fully within the accompanying Landscape Statement.
- 7.4 In respect of the third reason for refusal, it is further considered that the approval of this proposal would not set an undesirable precedent and any subsequent planning proposal of a similar size in the locality would have to be carefully assessed on its own merits and evaluation of specific impacts with regard to landscape, visual amenity, heritage, ecology, aviation etc such that approving this proposal therefore would not undermine the application of relevant Development Plan Policies on a considered site-by-site and scheme-by-scheme basis by the Council in the future.
- 7.5 It is considered that the LPA, in reaching its delegated decision, failed to take proper account of the need for renewable energy and the legally binding requirements nationally and internationally in balancing the (great) need for renewable energy when balanced against the (limited) impact on interests of acknowledged importance. This is a significant Development Plan policy and one which afforded added weight by virtue of the statements supporting the principle of renewable energy generation in the NPF2 and SPP.
- 7.6 It is considered that the proposed turbine at land South West of Drummick Farm would make a small but valuable contribution to delivering the Government's sustainability objectives.
- 7.7 It is considered that the 'Principle of Development' has been demonstrated to be acceptable against the provisions of the Development Plan, particularly in light of the overwhelming support provided for renewable schemes within national planning policy. The LPA has confirmed through the Officer's Report of Handling that the

proposed turbine has been found to be acceptable on a number of technical grounds, including:

- Existing cumulative impact
- Compatibility with existing land uses
- Protected species/habitats
- Cultural heritage
- Shadow flicker
- Aviation
- Noise;
- Road/Access Issues

7.8 In essence, this Review needs to consider the planning balance of the merits and effects of the proposed scheme. In assessing the potential harm to landscape and visual and residential amenity, Mr Cook concludes that he considers the proposed Drummick wind turbine would not give rise to unacceptable landscape and visual effects and would be an appropriate form and scale of development that could be successfully accommodated within the local and wider context of the lowlands.

7.9 The proposal is considered to be well sited whereby visual effects are minimised and consequently the turbine could be effectively accommodated in the landscape. As a result would contribute to the national need for renewable energy without material harm to the local environment.

7.10 On the basis of the evidence provided within this Planning Appeal Statement and the accompanying Landscape Appeal Statement, it is respectfully requested that the Local Review Body overturn the Officer Delegated Decision and grant planning permission for the proposed wind turbine at Drummick.

REQUEST FOR REVIEW

**AN APPEAL BY
CLEARWINDS LTD
DRUMMICK WIND TURBINE, GLENALMOND,
PERTH**

**LANDSCAPE STATEMENT
A COOK BA(Hons), MLD, CMLI, MIEMA, CEnv**

Pegasus Planning Group Ltd
Pegasus House
Querns Business Centre
Whitworth Road
Cirencester
Glos
GL7 1RT

Telephone: (01285) 641717 Facsimile: (01285) 642348

Local Planning Authority Ref: 12/00401/FLL
Appeal Ref: TCP/11/16(205)
PPG Ref: CIR.C.0362

Date: 23rd August 2012

COPYRIGHT

The contents of this document must not be copied or reproduced in whole or in part without the written consent of **Pegasus Planning Group Ltd**

CONTENTS:

Page No:

1.	AUTHOR'S QUALIFICATIONS AND EXPERIENCE	1
2.	SCOPE OF EVIDENCE	4
3.	DESCRIPTION OF THE PROPOSALS	9
4.	DESCRIPTION OF THE SITE AND THE SURROUNDING AREA	10
5.	EFFECT ON LANDSCAPE CHARACTER	11
6.	EFFECT UPON LANDSCAPE ELEMENTS AND FEATURES	19
7.	VISUAL AMENITY	21
8.	RESIDENTIAL VISUAL AMENITY	26
9.	PLANNING POLICY CONTEXT	48
10.	OTHER MATTERS	53
11.	SUMMARY AND CONCLUSIONS	56

APPENDICES

APPENDIX 1	NEARBY RESIDENTIAL PROPERTIES PLAN
APPENDIX 2	HIGHLAND BOUNDARY FAULT LINE AND DEVELOPMENT CONTEXT PLAN

1. AUTHOR'S QUALIFICATIONS AND EXPERIENCE

- 1.1 My name is Andrew Cook and I hold a Bachelor of Arts degree in Geography (BA Hons) and a Masters Degree in Landscape Design (MLD). I am a Chartered Landscape Architect, Chartered Member of the Landscape Institute (CMLI), Chartered Environmentalist (CEnv) and Member of the Institute of Environmental Management and Assessment (MIEMA).
- 1.2 I am one of the founding Partners of Pegasus Planning Group which was established in 2003. Since then the company has grown, establishing eight offices across the UK, employing approximately 150 planning and environmental planning professionals. I head the environmental planning division in which renewable energy development accounts for a significant part of the business. The company is both a corporate member of the Institute of Environmental Management and Assessment (IEMA) and is registered as an 'Environmental Registered Assessor' company.
- 1.3 I have gained over 20 years of consultancy experience whilst working for a number of private practices. Prior to establishing Pegasus Planning Group, I was an Environmental Director at RPS (formerly Chapman Warren Planning Consultants) where I specialised in addressing environmental planning issues as they related to large scale strategic projects. I have had considerable experience of and involvement in a wide range of development and built infrastructure projects throughout the UK, many of which have involved statutory protected landscapes including National Parks, Areas of Outstanding Natural Beauty (AONB) and Heritage Coasts as well as non-statutory local landscape designations. I have presented evidence at public inquiries on more than 50 occasions to address landscape and visual issues.
- 1.4 I am based in the Cirencester office of Pegasus Planning Group where I manage a team of 18 environmental planners and landscape architects. I am currently involved with over 100 renewable energy projects, the majority of which are wind energy developments. These wind energy projects range across a wide spectrum, from small-to-medium scale wind turbines through to large utility scale wind energy developments. I am advising over 30 developers on matters concerning environmental planning with a particular emphasis on landscape and visual matters.
- 1.5 I advise Renewable UK, the trade association for the wind energy sector, and sit on several steering groups including the Onshore Strategy Group and the Medium Wind

Steering Group Committee. I routinely assist Renewable UK in respect of matters relating to environmental planning. I participated in a series of Natural England (NE) workshops as part of the consultation relating to the drafting of the 'Making Space for Renewable Energy: Assessing Onshore Wind Energy Development' publication. In particular I assisted Renewable UK in formulating responses to the Natural England's drafts of this document. I have presented a number of papers at conferences in recent years on environmental issues as they relate to wind energy development and the planning system, particularly focussing on landscape and visual considerations.

- 1.6 Pegasus Planning Group were appointed by Renewable UK to assist in the preparation of planning guidance for Local Planning Authorities with respect to small scale wind turbines (ranging up to 50kW) in co-ordination with the (as then) Small Wind Steering Group. As part of that exercise we co-ordinated a range of specialist consultants in order to prepare the drafting of the Small Wind Planning Guidance. This guidance is particularly geared towards encouraging Local Planning Authority Officers to adopt an appropriate and proportionate response to small wind turbine planning applications. The document is available on Renewable UK's website.
- 1.7 As a chartered landscape architect I provide professional and impartial advice to assist a wide range of renewable energy developers. This regularly involves giving careful consideration to the circumstances relating to each project, its site and its environs to determine the project's appropriateness in landscape and visual terms.
- 1.8 Pegasus recently presented landscape evidence at the Burnt House Farm Public Inquiry (which was allowed), Kirkharle Public Inquiry (which was dismissed) and Upper Vaunces Public Inquiry which is pending a decision. Recent wind energy projects also include the preparation of a Written Statement for the refused application at South Sharpley, Durham on behalf of Cornwall Light & Power (recently renamed REG Windpower). This project effectively forms an extension to the two wind farms (Great Eppleton and High Sharpley) and would provide an additional capacity of 7.5MW based on 3 number 2.5MW turbines. This project was refused on visual residential amenity grounds but the appeal was upheld by the Planning Inspector. Pegasus have been recently successful in securing Planning Permission for the Sancton Hill Wind Farm which is located in an environmentally sensitive location within the Yorkshire Wolds, within the East Riding of Yorkshire, where landscape and visual amenity issues were a key consideration for the Case Officers

and Members of the Planning Committee. Here, we secured planning consent with respect to this project addressing the initial concerns raised by the Council in respect of landscape character issues.

- 1.9 On behalf of Ecotricity, I have recently appeared as an expert witness at both the Silton (ongoing) and Lilbourne (allowed) wind farm public inquiries. As part of my evidence I prepared a residential visual amenity study to assess how the outlook of local properties would be affected by the wind farm. I also undertook a landscape sensitivity and capacity study to address concerns relating to the local and wider landscape.
- 1.10 I and my landscape architects within my team at Pegasus Environmental undertake our work in compliance with the Landscape Institute's Code of Conduct.
- 1.11 I have been involved in the Drummick proposals since the inception of the current appeal scheme.

2. SCOPE OF EVIDENCE

- 2.1 This Landscape Statement has been prepared on behalf of the Developer Clearwinds Ltd. by Pegasus Planning Group in respect of a medium scale wind turbine (as defined by Scottish Natural Heritage) proposed at Drummick. The Appeal addresses the Reason for Refusal issued by Perth and Kinross Council. This Landscape Statement is to be read in conjunction with the Planning Statement, prepared by Pegasus Planning which provides the planning context with respect to the proposal. The Landscape Statement comprises this document together with separate A4 size appendices, which together specifically address the Reasons for Refusal with respect to landscape and visual impact assessment matters.
- 2.2 The landscape Statement explains why in landscape and visual terms it is considered that the proposed wind energy development is appropriate given its site and context.

Background to the Appeal

Clearwinds Ltd. submitted an application on 5th March 2012 (Application reference no. 12/00401/FLL) for a medium scale wind turbine at Drummick, Glenalmond, Perth.

- 2.3 This Landscape Statement specifically addresses the Reason for Refusal Number 1 and 2 raised by Perth and Kinross Council made in respect of the application as it relates to landscape and visual issues and the effect of the proposed development on the Residential Amenity.
- 2.4 Reason for Refusal 3 which relates to precedent for similar sized developments is addressed separately in a planning statement prepared by Pegasus Planning.
- 2.5 The first reason for refusal in the decision notice is as follows:

"As the proposed turbine will have a significant adverse impact on the visual amenity of the area, which is presently enjoyed by a host of receptors including (but not exclusively) existing residential properties and visiting recreational users,
the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (visual) amenity from new developments with the landward area, and Environmental and Resource Policy 14 of the Perth and

Kinross Structure Plan 2003 which seeks to protect existing local environmental quality from inappropriate renewable energy developments". (My emphasis)

2.6 The second reason for refusal in the decision notice is as follows:

"As the proposed turbine will potentially have a significant adverse impact on the residential amenity of existing residential properties (by virtue of the turbines appearance and scale when viewed from their properties), the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (residential) amenity from new developments within the landward area".

The proposal is not in accordance with the Development Plan and there are no material reasons which justify departing from the Development Plan". (My emphasis)

2.7 The statutory consultee the Ministry of Defence (MoD) did not object to the proposed development.

2.8 Several local organisations: the SMA Glen Protection Group; East Strathearn Community Council; Glenalmond College; and Methven & District Community Council objected to the development citing effects on the landscape, cultural heritage and visual amenity.

2.9 Some local residents object to the proposed wind turbine in landscape and visual terms.

2.10 This Landscape Statement seeks to address the landscape issues that have been raised in the Reasons for Refusal and explain why in landscape and visual terms the proposed wind turbine is considered acceptable for Drummick.

2.11 One of the key considerations is that the proposed development whilst visible from some locations of the nearby landscape, is located within a landscape which does not attract any statutory or non statutory landscape designations.

2.12 For the statement the following documents are relied upon:

- Landscape and Visual Impact Assessment (LVIA) submitted with the application.

- Perth and Kinross Reasons for Refusal.
- Strathearn Local Plan 2001.
- Perth and Kinross Structure Plan.
- Tayplan June 2012.

2.13 These documents are relied upon to help in the assessment of the wind turbine and its surrounding environs including:

- Details concerning effects upon landscape elements.
- Details concerning effects upon landscape character.
- Details concerning effects upon visual amenity and residential amenity.

Valency

2.14 Compliance with the Landscape and Visual Impact Assessment (LVIA) requires that the likely significant effects that have been identified should be assessed to determine as to whether or not they are positive (beneficial) or negative (adverse) in nature.

2.15 There is a range of public opinion on whether the landscape and visual impacts of a wind farm proposal are positive (beneficial) or negative (adverse). Publications such as 'Public Attitudes to Wind Farms' (Scottish Executive 2003) and visual surveys demonstrate that wind farm developments generate a spectrum of public responses ranging from strongly adverse to strongly positive. Some people consider turbines to be attractive and welcome such a structure to a landscape while others simply see them as a 'blot' on the landscape and find them objectionable. This range of opinion from positive to negative is often referred to as the concept of 'valency' and has been discussed and debated at numerous wind farm public inquiries.

2.16 The term valency appeared as guidance within a Durham County Council study (1996), and recognised that there may be a wide range of responses to wind turbines, both positive and negative.

2.17 Wind farms do give rise to a considerable range of opinions, ranging from strongly adverse to strongly positive. This is as true for professional opinions as it is for members of the public, and from individuals to organisations.

2.18 Whether or not an identified change in a view of the landscape is considered positive, neutral or negative, it cannot therefore be definitively stated.

- 2.19 It has been demonstrated in a number of public perception studies that, whether or not the landscape or visual effects will be considered as either positive or negative, will depend on the personal view of individuals. One such study is the 'Green On Green Public Perceptions of Windpower in Scotland and Ireland', November 2005. This study demonstrates that public attitudes to wind turbines vary considerably, ranging from those who see them as beautiful to those who find them unattractive. The consensus of opinion, however, appears to demonstrate a positive attitude towards wind energy. The study also found that there was a change in public perceptions and opinions expressed before construction of a wind farm, when compared to a more positive view expressed post construction.

Scope of Evidence

- 2.20 In light of the concerns that have been raised by the parties identified in the preceding paragraphs, the landscape statement proposes to address a number of aspects that relate to landscape and visual matters. Having provided an overview in terms of description of the site and its local context this statement considers how the wind turbine would have a bearing upon landscape elements associated with site and its surroundings. The statement also considers how the proposed turbine would have an effect upon landscape character locally and how the development would have an effect upon the wider landscape. The statement also addresses how the proposal would have an effect on residential amenity locally. In considering these matters the statement explains how the environmental capacity of the local landscape can effectively accommodate the proposed wind turbine. Relevant planning policies are reviewed to explain how the proposals would be in accordance with the Development Plan.
- 2.21 There are two main elements to the proposed development – the wind turbine and the anemometry mast. However, the movement of the wind turbine blades mounted on the tower normally forms the most noticeable elements of the wind energy development and therefore it is the turbine itself that I focus upon within my statement. The anemometry mast would be replaced by the wind turbine itself after the monitoring period.
- 2.22 Should the Appeal be upheld and the proposed development be implemented, there are three stages (construction, operation and decommissioning) that may give rise to landscape and visual effects. Whilst the construction and decommissioning stages

are worthy of note, they are considered to be of less importance in comparison to the operational stage as they are relatively short in duration. Consequently, it is the operational phase of the project that I focus upon for the purposes of my review and statement.

3. DESCRIPTION OF THE PROPOSALS

- 3.1 The proposal as described within Section 1 of the Environmental Reports Compendium (February 2012) and Section 4 of the Landscape and Visual Impact Assessment Report includes for the erection of a single wind turbine up to 77 m to blade tip height above existing ground level for a period of 25 years and for the erection of an anemometry mast of up to 50 m above ground level for an 18 month period on land at Drummick, Glenalmond, Perth.
- 3.2 The turbine would have a hub height of approximately 50 m and a height to the blade tip from ground level of approximately 77 m. The rotor diameter would be some 54 m, with a blade length of approximately 27 m.
- 3.3 The exterior finish of the proposed turbine would be a non-reflective off white which is a typical finish to wind turbines within the UK subject to approval by Perth and Kinross Council.
- 3.4 Access for construction and maintenance would be from the adjoining C classified road south of Drummick Farm and an on-site track.
- 3.5 Electric cable connection to the grid would be underground.
- 3.6 No trees or hedges would have to be removed in order to erect the proposed wind turbine.
- 3.7 The wind turbine is designed to be operational for a limited period of 25 years and then decommissioned. It can be decommissioned readily at the end of its operational life span and the landscape of the site would be fully restored to its pre-development state. Along with the removal of the turbine, the concrete foundations can be dug out to a depth of 600mm to ensure that the site can return to agriculture. The time limited nature of wind turbines is an important consideration when having regard to landscape and visual effects given the developments' reversibility enabling a site to return to its original state.

4. DESCRIPTION OF THE SITE AND THE SURROUNDING AREA

Description of Site

- 4.1 A description of the site and its surrounding area is set out in the Landscape and Visual Impact Assessment Report paragraphs 3.1 to 3.34 (application documentation).
- 4.2 The appeal site is located within fields on land known as Drummick situated approximately 1km south of the B8063 near Glenalmond (Appendix A of the LVIA). The fields are currently used for grazing. The fields exhibit few perceptible high points and are distinctly level at approximately 200 metres Above Ordnance Datum (AOD). There are no footpaths, bridleways, highways or other public rights of way through the site, nor any buildings within the appeal site boundary (Appendix A of the LVIA).
- 4.3 The proposed wind turbine would be located 370 m west of a C classified road south of Drummick Farm and at equal distances from the north western and the south eastern boundaries of the irregular shaped field. The boundaries around the field consist of post and wire fencing (Appendix A of the LVIA).
- 4.4 Mature forestry runs adjacent to the site boundary south of the site forming a degree of visual enclosure to the appeal site (Appendix A of the LVIA).
- 4.5 Overhead pylon and transmission lines cross the fields and access track to the east of the proposed wind turbine forming a visually prominent vertical and horizontal element within the surrounding landscape.
- 4.6 The closest National Scenic Area (NSA) is located some 15km northeast of the appeal site.
- 4.7 It is considered that only close proximity to a listed building may potentially affect the designation or its settings. There are two Grade A and 10 Grade B listed buildings within 5 kilometres of the proposed development. Listed buildings identified through desktop studies were Grade A and B only and those located within the 2 kilometre zone were likely to be affected by the proposed development due to screening effect of nearby vegetation.

- 4.8 There are no other statutory or non statutory designations within close proximity to the appeal site that will be adversely affected by the proposed development.

5. EFFECT ON LANDSCAPE CHARACTER

- 5.1 The proposed turbine would result in limited change in the visual amenity and landscape character associated with the surrounding area. Such change in this regard is I consider not in itself a reason for dismissing the appeal.

- 5.2 The Inspector at Sober Hill Inquiry (APP/E2001/A/09/2101421) CD103 noted that landscapes are dynamic systems constantly changing and noted that:

“Whilst the landscape is a fine resource, the changing character of the landscape also needs to be recognised. As N. Fairbrother expressed it: “the countryside is not an inert composition like a painted picture, but is a living entity which cannot survive as a museum piece”. The Yorkshire Wolds in the vicinity of the site do not currently include wind turbines and the development proposal would amount to a sizeable change in land use and appearance. However the thrust of PPS 7 is that the rural areas have to include a living and working dimension. To my mind, that means they will always have to accommodate some change.” (my emphasis)

- 5.3 The landscape is dynamic and ever-changing, responding to how ecosystems react to the climate and how man manages the environment in terms of management and maintenance regimes.

- 5.4 A description of the landscape character areas and an assessment of the potential effect on the landscape character of the wider landscape is set out within the submitted application LVIA Section 6 paragraphs 6.1 to 6.22. I proceed to review the site's local character context. The application LVIA explains that the site and the surrounding landscape which is predominantly rural would have the potential to accommodate a medium wind turbine of the scale proposed.

- 5.5 The character of the local landscape is summarised in the bullet points beneath:

- A85 main road prominent in the landscape.
- C Class road links.
- Fields, small, medium and large in scale.
- Hedges on lower slopes and walls on upper slopes.

- Low ridges and hills separating lowland straths and adjoining the nearby uplands.
- Extensive woodland, including forestry plantations.
- Topographically the area is transitional in character with pastures on lower slopes, giving way to rough grazing and even open moorland.
- Telecoms masts
- Electricity Pylons.
- Evidence of several phases of historic settlement.
- Influence of modern development.
- Sparse scatter of Farmsteads.
- Large Farm buildings.
- Landscape is punctuated with a number of isolated residential properties.
- There are a number of access tracks.

Site and its Immediate Surroundings

- 5.6 The location of the appeal site and the proposed wind turbine is at the cusp of two different landscape character types as identified within the Scottish Natural Heritage Landscape Character Assessment (1999). There is the **Lowland Hills landscape character type** and the **Broad Valley Lowlands landscape character type**. Consequently the appeal site, can be considered to be within a transitional landscape which in term is within the transitional landscape from the highlands to the lowlands.
- 5.7 The variation and differences that occur within the identified landscape character types is a result of comparatively coarse grain scale appraisal of the assessment study areas. Landscape Character Assessments have always had to make some compromises through what is termed a 'best fit analysis' in order to place landscapes within broadly homogenous landscape types or areas. This is a widely accepted approach that is generally reliable, but it is at the periphery of such landscape character areas and at their boundaries where the characterisation of landscapes becomes less reliable.
- 5.8 It is evident, when reviewing these landscape character types that the line dividing them is not a definitive one, as for instance would be the case if the appeal site were in a coastal location. The apparently definitive dividing line of the A85 main road between the two character types, does not reflect a marked change. Rather the alignment of the roadway is in itself arbitrary in landscape character terms having

being determined not by the character of the landscape through which it is passing but by engineering alignment requirements.

Local Character Assessment

The local character assessment classifies the site in the **Lowland Hills Landscape Character Type** (Refer to appendix E of the LVIA). Key landscape characteristics include:

- **Low ridges and hills separating lowland straths and adjoining the nearby uplands;**
- **Composed of soft, red sandstones;**
- **Transitional character with pastures on lower slopes, giving way to rough grazing and even open moorland;**
- **Evidence of several phases of historic settlement;**
- **Extensive woodland, including forestry plantations; and**
- **Influence of modern development.**

5.9 It goes on to note under the heading "Land Use" that there are remains of thousands of years of settlement and land use, such as prehistoric remains and gateways. The assessment notes that agriculture predominates the area and there are signs of modern development including busy the busy A9 corridor and several large telecommunication masts which form major landmarks and which exploit the hills proximity to the settled lowland.

5.10 Under the heading Tall Structures (para 5.6.14 pg 168) the assessments make special note of the high voltage pylon lines that cross the area and the masts that are sited on high ground overlooking Perth, stating there may be pressure for additional masts as telecommunications traffic grows.

5.11 Within the tall structures heading the assessment recognises that due to the lower level of perceived constraint, together with the proximity to the existing electrical distribution network, the area could withstand wind turbine development and avoid the need to locate turbines in the more sensitive upland areas. The assessment does however note that insensitive development could conflict the rural character of the area. (para 5.6.15 pg 169)

- 5.12 The assessment identifies guidelines which reflect the sensitivities of the landscape and the pressures for change acting upon it. Within a section named Tall Structures, the assessment states:

“Encourage the development of a regional strategy for renewable energy, including wind power, in order that the most appropriate types of development areas come forward”

- 5.13 In 2005 Perth and Kinross published its “Supplementary Planning Guidance for Wind Energy Proposals in Perth and Kinross”. In the context of the document, which gives additional guidance for the planning of wind energy developments, the Perth and Kinross area is separated in to two distinct areas, Sensitive Areas where there was a presumption against wind development and Broad Search Areas where there would be support for appropriate wind developments.

- 5.14 The appeal site lies within the Broad Search Areas, as such the proposed development which is the subject of the appeal should be assessed against these guideline criteria.

Character of the site and surrounding landscape

- 5.15 It is important to review the site’s local landscape character to establish how the wind turbine would affect the local landscape.
- 5.16 The character of the surrounding local landscape has also been assessed as advocated in “Supplementary Planning Guidance for Wind Energy Proposals in Perth and Kinross” to determine to what extent this environment could accommodate a wind turbine of the type proposed. The landscape forms a lowland agricultural landscape punctuated with varied forms of built infrastructure.

Landscape Scale

- 5.17 This medium scale dimension to the landscape forms a suitable immediate landscape context for the proposed medium scale wind turbine.

Landform

- 5.18 The local landscape is undulating but is punctuated with a network of low ridges and hills. Small valleys have been cut into the underlying geology creating a series of

convex ridges and valleys. This undulating nature of the landscape enables the topography to frequently screen views of built infrastructure in the area to a significant degree including the proposed wind turbine.

Landscape Enclosure

- 5.19 The site falls within an area of fields and plantation which extend across a landscape where the field pattern tends to be irregular and boundaries defined by plantation or hedges and fencing. Therefore the landscape exhibits a sense of visual semi enclosure.

Complexity of Land Cover and Features

- 5.20 The local landscape is generally complex with a network of fields and plantations which tend to be larger and more regular in scale. The most distinctive features are large areas of plantation which characterise the local area.
- 5.21 The landscape in the vicinity of the site is gently undulating and exhibits a complex form. The field in which the turbine is located benefits from a degree of enclosure that aids in reducing visual sensitivity.

Human Influence

- 5.22 The landscape to the south of the site exhibits a transport corridor which is dominated by the A85 but also exhibits a network of minor and smaller highways and country lanes.
- 5.23 The landscape is punctuated by a series of large settlements such as Crieff and Perth and small settlements including Harrietfield, Methven and Fowlis Wester. Also associated with this landscape there is a significant amount of built form/infrastructure including masts, overhead power lines and electricity pylons. Other human influences include a number of Hamlets and farmsteads with associated structures. All these elements of built form collectively punctuate the landscape to emphasise that whilst it is an agricultural landscape, it is nonetheless punctuated with built infrastructure to a high degree. Examples of the vertical influence of manmade structures can be seen in Viewpoint 9 (Appendix F of the LVIA)

- 5.24 Existing constructed or under construction wind turbines are evident throughout the surrounding area, such as Griffin Forest (15.7km), Calliacher (18.9km), Green Knowes (18.8km) and Lochelbank (19.9km) and whilst not within close proximity to the proposed development itself add a context to the area which means the proposed turbine is not out of character with the surrounding landscapes.
- 5.25 The proposals would not materially change the profile of human influence associated with this landscape. The existing variety and extent of the built infrastructure provide character context for the proposal.

Skylines and Setting

- 5.26 Much of the built form infrastructure such as masts, electricity pylons and overhead power lines are visually evident against the skylines within this local landscape. The proposed wind turbine at Drummick would be seen in the context of the existing local skylines.

Visibility and Views

- 5.27 Analysis of the Zone of Theoretical Visibility (ZTV) indicates that in theory much of this landscape would be visually affected by the existing wind farms. (Appendix C of the LVIA)
- 5.28 It is evident from this assessment that whilst the ZTV appears extensive, to the south east the actual zone of visibility, or the visual envelope, associated with the proposed wind turbine would be restricted and views would generally be limited in number. This is due to combination of the topography and the layering effect of existing intervening vegetation and structures.
- 5.29 Within views over 5 kilometres from the landownership boundary, the proposed wind turbine would be seen only as one element within a wider panoramic and composite landscape that already contains a number of existing infrastructure elements and features.

Historic and Cultural Environment

- 5.30 There are a wide range of notable historic and cultural heritage features across the landscape such as prehistoric remains and gateways. These include stone circles,

standing stones and several cairns and hut circles. However, the site itself does not have any such valuable resources.

Summary

- 5.31 Having looked in detail at the local character assessment of the proposed development site and assessed the criteria set out I have come to the following conclusions.
- 5.32 In published national character studies the site surrounding landscape falls within the Tayside Lowland Hills landscape character assessment. The studies consistently identify the key characteristics of this landscape as low ridges and hills. The site lies on working settled agricultural landscape punctuated throughout with a wide variety of built infrastructure including overhead pylons that run through the site itself. In many respects it forms quite a transitional landscape adjoining the higher sensitivity surrounding uplands, and is less sensitive in landscape terms. Much of it is not subject to any statutory or non-statutory, local landscape designations.
- 5.33 No statutorily protected designated landscapes (National Parks/ National Scenic Areas) would be significantly affected and no Historic Gardens and Designed Landscapes would experience significant effects.
- 5.34 The character assessment and analysis contained in the LVIA submitted with the application and the assessment noted in this statement illustrates that the predominantly agricultural landscape surrounding the site is able to satisfactorily accommodate a wind turbine of the type proposed. The general character of built infrastructure in the rural landscape is reflected by the presence of pylons and telecoms masts in the surrounding locality. There would be no material change to the overriding characteristics of the landscape, such as low ridges and hills, agriculture, extensive woodland and influence of modern development, with the proposed development in place. The introduction of the turbine with movement of the blades would not materially change prevailing character associated with the local landscape.
- 5.35 In respect of landscape character it is relevant that I clarify my findings to this aspect of the assessment. Direct effects on landscape character can occur within the landscape character type in which the wind turbine is sited. Indirect effects can occur

to the landscape character of adjoining landscape types, through perception of the wind turbine. Significant effects on landscape character can occur either directly or indirectly in this way. I consider that there will be significant effects on the landscape character of parts of the two LCTs that immediately surround the site (Lowland Hills and Broad Valley Lowlands), but that these effects will diminish within a distance of 5km to 6km from the turbine to a not significant level. I consider that the defining characteristics and integrity of the overall LCTs will not be significantly affected, such that they would become defined by the wind turbine. The effects on landscape character are therefore of a localised nature and do not extend to the whole of the LCTs.

6. EFFECT UPON LANDSCAPE ELEMENTS AND FEATURES

6.1 An assessment of the degree to which the landscape elements associated with the appeal site would be affected by the single medium scale wind turbine is assessed within the application LVIA in paragraph 4.9 page 10.

6.2 The Guidelines for Landscape and Visual Impact Assessment (Second Edition) defines 'elements' as:

"the individual elements that make up the landscape, including prominent or eye-catching features such as hills, valleys, woods, trees and hedges, ponds, buildings and roads. They are generally quantifiable and can be easily described." (GLVIA page 12)

6.3 In contrast the same document defines 'features' specifically as:

"A prominent eye-catching element, for example, wooded hilltop or church spire" (GLVIA page 120)

6.4 It should, however, be noted that in many guidance and policy documents the terms 'element' and 'feature' are often used synonymously.

6.5 There would be no significant loss of any of the landscape elements/features that are characteristic of the appeal site. No existing trees, hedges or fences within the appeal site and along its boundaries would be removed during the construction or operational phases of the proposed development.

6.6 As part of the appeal scheme proposals those characteristic elements of the appeal site in the form of trees would be enhanced through new, additional, tree planting near the properties south east of the appeal site's south eastern boundary. The long term effect of such new planting would be to provide further visual containment of the proposed turbine from these residential properties (Appendix H of the LVIA).

6.7 The appeal site would continue functioning as a grazing field with the proposed wind turbine in place. At the end of its proposed lifecycle the turbine would be decommissioned and there would be the opportunity if so desired to return the appeal site to a substantially unaltered state from that existing originally.

-
- 6.8 The physical characteristics of the proposed wind turbine would give it a light 'footprint' which would enable the wind turbine to be effectively accommodated into the landscape without causing significant change to the actual fabric of the appeal site. As the information provided within the application LVIA – Site Location Layout and Plan indicates a relatively small area of land would be required to accommodate the wind turbine and access track and the main landscape elements and features, the hedges and tree cover, would be retained. There would be a slight local landscape effect (in terms of degree of significance) upon landscape elements/features.
- 6.9 Similarly, the physical works involved in the construction stage of the proposals would be limited to within the appeal site, with the exception of the underground grid connection cable. There are no further off site works proposed. Therefore the physio-geographical elements and features of the landscape would remain physically unchanged. Consequently, the site's immediate visual appearance and characteristic elements as such would remain unchanged.
- 6.10 In my opinion, as the majority of the landscape elements and features which currently define the appeal site and the wider landscape would remain with the wind turbine in operation this would cause no unacceptable harm to the landscape fabric of the site. With minimal physical change to the character of the site and to the wider landscape as result of the proposed turbine being in place the actual physical change would be minimised.

7. VISUAL AMENITY

Effects on General and Recreational Visual Amenity

- 7.1 The public's appreciation of views from the countryside is mainly gained from public vantage points. The two main ways in which members of the public can gain an appreciation of views when in the countryside are from public highways and by using the network of Public Rights of Way in conjunction with Access Land and National Cycle Networks and various recreational walks which pass through the landscape.

Assessments of Effects of Visual Amenity within 1 km

- 7.2 In terms of public highways there is a C classified road and various unclassified roads within 1 km of the appeal site. As motorists are travelling through the landscape in this locality, their visual experience will essentially be a sequential one, as users of the highways pass through the landscape experiencing constantly changing views as they travel, generally at a relatively high speed.
- 7.3 I would accept that where there are occasional lines of sight and visibility between these highways and the proposed wind turbine and that where visible the turbine would be visually evident when in close proximity to the receptor.
- 7.4 However, lengths of these roads are flanked by treecover. Consequently, the motorist will regularly find that views are channelled along the orientation of the highway because of the flanking vegetation and/or changes in the local topography.
- 7.5 The orientation of the roadways and the direction of travel will determine the primary channel of view. As a consequence, given the orientation of the public roadways, many views would be channelled away from the proposed wind turbine along the orientation and line of the public roadway and thereby only allow limited opportunities to gain views of the wind turbine from oblique angles, which would often fall within peripheral vision.
- 7.6 As a single turbine there would be views of the landscape beyond and as a consequence views would not terminate on the turbine itself but upon the landscape beyond in many cases. Therefore whilst the wind turbine would be visible from some locations along these roadways within 1 km, the turbine would not materially detract from the receptor's visual appreciation for the landscape and its character.

- 7.7 In terms of public rights of way these are limited within 1 km of the proposed wind turbine. There are no long distance public rights of way which are promoted as recreational long distance walks.
- 7.8 Public rights of way and their routes tend to have regard to the field pattern and field boundaries and as a consequence these routes tend to be flanked by hedgerows and treecover in the local landscape. The local gently undulating topography of the landscape between the public rights of way and the proposed wind turbine collectively with the vegetation would assist to militate against the visibility of the turbine.
- 7.9 Where potential views of the proposed turbine have been identified the turbine would typically be seen in the context of the context of pylons that run to the north of the proposed wind turbine.
- 7.10 As a consequence users of these public rights of way would continue to have an appreciation of the landscape which would not be unacceptably affected with the turbine in place.

Assessment of Effects on Visual Amenity from 1-2 km

- 7.11 Beyond 1 km distance from the turbine, up to approximately 2 km, the physical distance and separation between visual receptors and the turbine would reduce the visual profile and presence of the turbine where visible. However, the blocks of woodland within the local landscape would restrict and limit potential views from public highways and public rights of way beyond 1 km distance.
- 7.12 Where potential views are possible from the south looking towards the Highland Boundary Fault then these are most likely to be of the blade tips above the trees and would not have an unacceptably harmful effect upon the character and visual amenity of the landscape.

Assessment of Effects on Visual Amenity between 2 and 5 km

- 7.13 Between 2 and 5 km of the appeal site the combination of undulating topography and woodland blocks would restrict the potential to observe the proposed wind turbine from the south and from large parts of the west and east. This wider landscape to the south also includes a degree of other existing infrastructure including the A85, pylons

and telegraph poles which would be more visually prominent in local views than the turbine itself.

Assessments of Effects on Visual Amenity beyond 5 km

- 7.14 Due to the nature of the land form in the area visibility beyond 5km is limited to views from the south east. From this south east location intervening woodland in the landscape between the receptor and the proposed turbine would limit views to the blades of the turbine above the woodland. Infrastructure such as the A85 and its associated traffic movement which lies between this location and the proposed turbine would be more visually prominent than the proposed turbine. Where the blade tips are visible above the mature tree line then the sense of movement produced by the proposed turbine and perceived by a visual receptor would essentially be no different to that of any other intermittently glimpsed sources of movement such as traffic along the A85. Therefore, the proposed turbine would not have an unacceptably harmful effect upon the character and visual amenity of the landscape.
- 7.15 It is important to note that three major roads, where the vast majority of travellers will experience the landscape, the A85, the A9 and the A822 all pass through the study area between 5km and 15km from the proposed turbine. The ZTV (Appendix C of the LVIA) shows that there is limited to no visibility of the proposed turbine from these roads, meaning visitors and commuters in the area would pass relatively close to the proposed turbine without ever having sight of it.
- 7.16 The agricultural and woodland landscape within 5 km of the wind farm reveals an environment which is punctuated with a variety of built infrastructure and man-managed farming landscape comprising hedgerows, treecover and woodland. Viewing within 5 km from both public highways and rights of way the turbine, as proposed, would be visible as an element within wide panoramic views. Nonetheless in terms of the overall effect that the turbine would have upon the visual amenity associated with the agricultural landscape, its influence would be limited in many locations and as a consequence the overall sense of appreciation of the agricultural landscape would remain materially unchanged with the proposed wind turbine in place, just as is the case with the existing settlements, highways and other built infrastructure which currently punctuate this landscape. In overall terms the public would still be able to appreciate this landscape as a predominantly agricultural environment with the proposed wind turbine in place.

Associations

- 7.17 The environment which forms the local landscape in respect of the appeal site is not associated with any notable literary or artistic works, nor is the environment associated with any 'designed landscapes' associated with historic parks, gardens or estates.

Summary

- 7.18 In close proximity to the wind turbine of this scale, the proposed development would be visually evident in the local landscape and would be prominent in some views up to 2km. However, the turbine would invariably be seen in the context of the existing pylons that run across the site to north, which would in some cases, where close to the viewer be larger in scale.
- 7.19 Given the slender nature of the turbine and its design, it affords a high degree of permeability allowing views through and beyond the turbine to the agricultural landscape beyond. As a consequence views would not terminate on the turbine itself, but upon elements and the landscape beyond. Therefore whilst the wind turbine would be visible and potentially evident for some locations in the immediate vicinity the turbine does not materially detract from the receptors' visual appreciation of the agricultural and woodland landscape and its character.
- 7.20 The principal mitigating effect at Drummick is the landform around the site itself, which effectively conceals views of the wind turbine beyond 5km to the north, west and west south west, which in the case of this study area includes several settlements and the principal road infrastructure. Consequently, in the 5km-10km radius zone around the site, in which there can often be significant visual effects, there is in reality very limited visibility. This can be confirmed by looking at the ZTV (Appendix C of the LVIA). It is for this reason that most of the significant effects are contained within a radius of 5km from the site, and indeed closer insofar as the land to the north of the wind turbine is concerned.
- 7.21 This is not to say that the effects of the proposed development, that are significant, are any less important, but simply to put them in a proper context for this type of development. The qualities of the Drummick site are borne out by the limited number of significant effects that would arise.

- 7.22 It is important to note that assessments of this type tend to focus on those locations and receptors where significant effects may arise. It is somewhat inevitable that locations for viewpoints are chosen where there is a prominent view of the site, and it is important that these are covered. But it is also important to record that the viewpoints are not always representative of the general outlook in their vicinity. There are large parts of the ZTV (Appendix C of the LVIA) within a 10km radius where there will be no visibility of the wind turbine at all. Many of the areas, with theoretical visibility, will also in practice be screened by the strong network of woodlands that characterises the more settled parts of the landscape; for example along the B8063.
- 7.23 In conclusion the local landscape which surrounds the appeal site is quite unremarkable in terms of its character and appearance. Whilst it is not unattractive, it is acknowledged that it is situated near some valued landscapes such as the Sma' Glen yet it does not exhibit any pronounced qualities of natural beauty which is a reflection of the presence of built infrastructure such as pylons which punctuates the local landscape. I therefore consider this local landscape is not of high sensitivity and as such is capable of effectively accommodating the proposed turbine whilst avoiding any unacceptable harm, with regard to the area's visual amenity and natural beauty.

8. RESIDENTIAL VISUAL AMENITY

Introduction

- 8.1 The separation between what is a private interest and what should be protected in the public interest is tolerably clear. This matter has been the subject of particular focus in wind energy development cases since the decision at Enifer Downs in April 2009. It is acknowledged that the approach adumbrated by Inspector Lavender, articulated in its fullest form at Carland Cross, should not be regarded as a mechanistic 'test' and has no status in terms of being part of statutory documentation or planning policy or guidance; however, it is most welcome to adopt a logical, transparent and objective approach. Whilst residential amenity includes more than one element including visual, noise and shadow flicker, in its second reason for refusal, the Council only refer to an unacceptable impact on the visual component, (by virtue of the turbine's appearance and scale when viewed from their properties).
- 8.2 As was pointed out at Burnt House Farm there can be no substitute for site visits to individual properties so that any likely impacts can be judged in the particular and unique circumstances of each. Nevertheless, it is helpful to consider the factors and thresholds of acceptability which have guided decision-makers in planning appeal decisions.
- No individual has the right to a particular view but there comes a point when, by virtue of the proximity, size and scale of a given development, a residential property would be rendered so unattractive as a place in which to live that planning permission should be refused. The test relates to the position which would pertain with the wind turbine in situ, irrespective of the position beforehand; in other words, the test is not whether in relative terms, a property would be a "substantially less attractive" place to live. The test is whether, viewed objectively in the public interest, a property would become an unattractive place in which to live. This situation, which, if left unchecked would lead to very undesirable consequences, was explicitly dealt with by Inspector Lavender at Carland Cross.
 - The public interest is engaged because it would not be right in a civil society to force persons to live in a property, which, viewed objectively, the majority of citizens would consider to be unattractive. The test is concerned with an assessment of living conditions as they would pertain with the wind farm built, irrespective of the starting point. At Burnt House Farm, the Secretary of State found it useful to pose the question whether "would the proposal affect the outlook of these residents to such an extent i.e. be so unpleasant, overwhelming and oppressive that this would become an unattractive place to live?"

- The test of what would be unacceptably unattractive should be an objective test, albeit that judgement is required in its application in the circumstances of a particular case.
- There needs to be a degree of harm over and above an identified substantial adverse effect on a private interest to take a case into the category of refusal in the public interest. This was expressly endorsed by the Secretary of State in (paragraph 10) of his decision letter at Burnt House Farm dated 6 July 2011. Changing the outlook from a property is not sufficient. Indeed, even a fundamental change in outlook is not necessarily unacceptable.
- The visual component of residential amenity should be assessed “in the round” taking into account factors such as distance from the turbines, the orientation, size and layout of the dwelling, internal circulation, division between primary and secondary rooms, garden and other amenity space, arc of view occupied by the wind farm, views through the turbines and the availability of screening.
- Each case has to be decided on its own merits but other appeal cases provide a useful benchmarking exercise. Granting permission here would be entirely in line with such decisions.

8.3 There would be no unacceptable effects on the visual component of residential amenity in the case of any individual dwelling. At no individual residential property would the single turbine be visually overbearing, overwhelming or oppressive. Given the modest scale of the development, location of the turbine, distances involved, orientation of properties and amenity space and openness of view, any effects on outlook would not cross the public interest line.

8.4 The proposed turbine would result in change to the local landscape and this would involve change to the local character and composition of a number of views. However, change in itself is not unacceptable. Change of this type and magnitude is an acknowledged impact of a policy of deployment of wind turbines in the Scottish countryside. None of the likely significant environmental effects that would result from the proposed wind turbine would be unacceptable in the public interest which the planning system is there to preserve.

Approach Adopted for Nearby Properties

8.5 Residential receptors nearby to the site were reviewed as part of the LVIA for the application. The analysis demonstrated that there are a number of residential properties located in the area surrounding the appeal site. (Appendix 1)

- 8.6 I have established that within a distance equivalent to 5 times tip height (385 metres) there are no residential properties nor within a separation distance of 6 times tip height (462 metres). However there are five properties beyond this separation distance and therefore the range is extended to 770 metres (10 times tip height). The nearest property is the bungalow located at 505 metres from the turbine. Drummick Farm located to the north east is 561 metres from the turbine, property 2 at Sluidubh is 597 metres and property 1 at Sluidubh is 630 metres distance. A further property to the north west is some 683 metres from the turbine (property number 3).
- 8.7 I do not consider that the proposed development would give rise to unacceptable effects upon on the views from residential properties beyond 770 metres from the turbine.
- 8.8 Professional judgement has been used to balance the various modifying (militating) factors and conclusions which are drawn concerning the visual effects on views from the ground and upper floors of the dwelling and the curtilage for each property and to determine whether views would result in an 'overbearing' effect on the overall residential visual amenity experienced by the residents of each property such that the property would become an unattractive place to live when viewed objectively.
- 8.9 The methodology that is used is the same as that used to conduct landscape and visual impact assessments, but also takes account of details of each property concerning: the direction and extent of the view from windows on the relevant elevations and associated curtilage; the location of windows; elevations of the property; the vertical and horizontal angle of view available of the turbine; and the position and extent of intervening features within the landscape (vegetation and built form) that are likely to influence (militate against) the view. This method requires a judgement to be made on likely visual effects and whether these effects may be potentially significant and secondly whether the nature and character of the visual effects may be considered to be so great, as to be 'overbearing' or 'overwhelming'. It should be noted that a significant visual effect is not necessarily an unacceptable effect and therefore should not automatically be assumed to be so.
- 8.10 My judgement on the likely visual effects on residential receptors draws on over 20 years of experience as a Chartered Landscape Architect conducting landscape and visual impact assessments for a wide range of developments including wind energy

projects, and my understanding of decisions reached by Planning Inspectors who have considered such effects. I also draw on my experience of revisiting developments once they have been constructed.

8.11 Distance from the site is only one of the factors that should be taken into account when determining the magnitude of visual impacts on any given residential property.

8.12 Other factors include:

- Whether the primary view of the turbines would be from the ground floor or upper floor windows or the curtilage;
- Whether the view of the turbine is in a direct or oblique angle given the orientation of the property;
- The extent to which the view is obstructed by vegetation or landform; and
- The extent to which the current view is influenced by built structures (e.g. buildings, roads, pylons).

These factors have been appropriately taken into consideration in the residential study.

Effects on Residential Properties within 770 metres of the proposed turbine (10 x tip height)

8.13 The sensitivity and magnitude of change for all identified residential visual receptors has been assessed by Chartered Landscape Architects from Pegasus Environmental, based on information collected in the field, desktop study, and an understanding of the criteria set out above.

8.14 I make reference to habitable rooms which correspond to primary living rooms such as lounge, dining room or kitchen; bedrooms and conservatories. Non-habitable rooms correspond to circulation areas (such as hallways, corridors, and landings), toilets, bathrooms and utility rooms. Non-habitable rooms and windows on side elevations are assessed as having low sensitivity to change.

8.15 Views from ground floor windows on principal elevations of the building are likely to correspond to primary living rooms such as lounge, dining room or kitchen; conservatories and are therefore assessed as having a high sensitivity to change. Views from upper floor windows on principal elevations of the building are likely to correspond to bedrooms and study/office rooms and are assessed as having a medium sensitivity.

Distance parameters

8.16 There is no clear consensus about the minimum distance from a property within which a wind turbine may have an *overbearing* effect. Planning inspectors have drawn different conclusions on this matter reflecting the individual circumstances and context in each case. There does however, appear to be some definitive conclusion about the distance within which a turbine will be overbearing and as a guide broadly equates to five times the tip height. This is confirmed in a number of appeal decisions.

8.17 In relation to the Sixpenny Wood development the Planning Inspector concluded that:

“During my accompanied site visit I was taken to a number of the dwellings closest to, and with the clearest views of, the appeal site. The occupants of these dwellings would be the most seriously affected by the development. It was clear to me that the turbines would be very prominent in views from those properties, as well as from others in similar locations, and to a lesser extent properties and villages further afield.

But that prominence does not necessarily equate to harm. There would, of course, be a significant change in the view from those properties. The outlook would change from an aspect generally across open fields to an outlook in which turbine or turbines would be the main feature within the landscape. I can well appreciate that many would find that a serious diminution of their outlook, though I accept that others would find them acceptable or attractive.

The distance to one or more turbines from any dwelling not associated with the development is agreed to be around 600m as a minimum. That is over four times the height to tip of the turbines themselves. The turbines are slim and would not fill the field of view, though there are locations where more than a single turbine would be prominent. Nonetheless, the landscape between the turbines would remain, and would be the major horizontal component of any view. Whatever personal feelings are held it is my judgement that given the spacing and configuration the turbine would not be so dominant that they would introduce unacceptable obtrusiveness, be overbearing to the point of oppressiveness, or otherwise lead to visual intrusion would amount to significant harm to living conditions.”
(APP/E2001/A/09/2101851)

(my emphasis)

8.18 At the Cliffs Farm, Ornskirk Inquiry, the Planning Inspector concluded:

“As for the visual impact from the closest dwellings, I note that Cliffs Farm, Boundary Farm, Back Farm, Back House and Moss House are about 500m from the nearest turbine, whilst Woodland Farm is further away, somewhere in the order of 600m. Given these distances and the wide expanse of space afforded by the mosslands landscape and the backdrop provided by the broad expanse of sky against which the turbines would be seen, I do not consider that the impact of turbines when seen from these dwellings would be unacceptable.” (APP/D2320/A/08/2069152)

(my emphasis)

8.19 At the Carland Cross Inquiry, the Planning Inspector noted:

“The closest properties to existing and proposed turbines are at Carling Cross (about 400m). Among these, the most attractive outlook from the bungalow at Rosehill Farm is in the opposite direction, across the open landscape to the south. Carland Cross Cottages have rear kitchen windows and small sitting out areas on their northern side but these are sunken below road level. Moreover, views of the site from here are largely across the foreground concrete apron of a filling station and (because of the gradient), in part, between the supporting stanchions of its canopy. A strong impression of movement is also inherent from the passing traffic along the A30 and around the Pump Islands. The present outlook would not much change and the existing living conditions here, I consider, remain as now and be satisfactory.” (APP/DO840/09/2103026)

(my emphasis)

8.20 The above statements suggest that turbines visible at a distance of 400 metres can be acceptable for large scale turbines of up to 125 metre tip height.

8.21 Further guidance on what is deemed to be an acceptable separation distance between proposed turbines and residential properties is provided in the Goveton, Devon Inquiry where the Planning Inspector noted:

“The proposal would have a significant effect on the outlook from the dwelling at Pasture Coombe, which lies about 500m from the site of the proposed nearest turbine. The top of the blades of this turbine would be about 110m above the height of the Pasture Coombe because of the difference in ground levels... The occupiers of this property would certainly be constantly aware of the presence of such high, moving structures. However, the turbines would be slender structures, and I do not believe that they would, at this distance and height, have an overbearing or dominating

impact that would harm the residential amenity that the occupiers of Pasture Coombe could reasonably expect in this rural agricultural setting. A large bulky structure close to a dwelling, which gave it an enclosed feel might have such an effect, but that is not the case here. My judgement is that the appeal scheme would not have an unacceptable effect on the living conditions of the occupiers of Pasture Coombe by reason of its adverse visual impact."
(APP/K1128/A/08/2072150)

(my emphasis)

8.22 This further reinforces the fact that a separation distance of 500m which in this particular case equates to 5 times the tip height is considered to provide a reasonable sense of separation between turbines and residential properties to ensure that the visual amenity of the occupiers of the properties are not unacceptably affected.

8.23 A number of key modifying factors need to be taken into account when assessing whether a turbine will have an overbearing impact on any given residential property. Such parameters include the following:

- The height and dimensions of the proposed turbine;
- The elevation of the turbine above or below that of the property;
- Whether the view in which the turbine or turbines are visible would be direct or oblique;
- The vertical field of view occupied by the turbine;
- The horizontal field of view occupied by the turbines if dealing with an array of turbines;
- The massing and layout of the turbines where multiple turbines are visible;
- Whether the primary views are likely to be experienced from ground floor windows, first floor windows or within the garden environment of the property, i.e. within its curtilage;
- Any screening such as vegetation or buildings which restrict views of the turbines; and
- The context within which the turbines are visible.

8.24 Whilst not exclusively determinative, distance from a property is still clearly an important factor to be considered in assessing whether a turbine is overbearing or not. However it would seem that a number of independent judgements have found that wind turbines do not have an unacceptable overbearing effect on residential visual amenity of a property where it is in a range of 400-500m.

- 8.25 In an appeal at Knabs Ridge, Kettlesing, the Inspector, when considering the impact of the proposed development of 8 turbines of 98m maximum height (to tip), located at 440m and 580m from the closest properties, concluded:

"In views from these and other properties, the turbines would be prominent. But there is a difference between something which is prominent and something which is oppressive. In my judgement the visual impact on residential amenity would not quite cross the threshold into the latter category."
(APP/E2734/A/O4/1161332)

(my emphasis)

- 8.26 At the Shipdham in Norfolk, when considering the impact of the proposed development of two 100m high turbines, two separate planning inspectors came to the same conclusions regarding impact on residential on amenity of nearby properties, the closest of which was only 429m from one of the turbines, orientated towards the site with uninterrupted direct views. The conclusion was that the turbines:

"would appear large but they would not be overwhelming"
(APP/F2605/A/O5/1174295)

- 8.27 Therefore, it is clear that even where there are direct and uninterrupted views of a wind turbine, at a distance of under 500m, there are circumstances as in this case where the turbine would not be considered to have an overbearing effect on visual amenity and living conditions.

Parameters concerning Residential Visual Amenity

- 8.28 It is a long held planning principle that there is no right to a view. At the Inquiry for the Npower Renewables Ltd 5 turbine wind farm at Earls Hall Farm, Clacton-on-Sea, the Planning Inspector confirmed:

- i. ***"It is a long-established planning principle that the right to a view from a property is not inviolable."*** (Appeal ref: APP/P1560/A/08/2088548)

- 8.29 Similarly, at the Inquiry for the Next Generation Ltd 5 turbine wind farm at Burnham-on-Sea, Somerset, the Planning Inspector concluded:

- i. ***"It is a well held planning principle that there is no "right to a view" such that an attractive or cherished outlook from a private property can***

be protected from development that would adversely affect it. The fact that the proposed wind turbines would be seen from a number of dwellings in the surrounding area, and in some cases would be prominent and would significantly change views of the countryside, is not determinative in itself. (Appeal ref: APP/V3310/A/06/2031158)

8.30 However, there is a general consensus that in certain circumstances, wind turbines can have an overbearing, overwhelming or overpowering effect on residential visual amenity and in these circumstances, wind turbines can have an unacceptable effect on living conditions. Several Planning Inspectors have clarified that where turbines have an 'overbearing' effect on residential visual amenity this may be a material consideration in determining the appeal. At the Inquiry for the Npower Renewables Ltd 10 turbine wind farm at Bradwell-on-Sea, Essex, the Planning Inspector concluded:

- i. ***"It is a well-established planning principle that there is no right to retain unchanged a view from private property. However it can be in the public interest to safeguard the outlook from such property in respect of unacceptably overbearing or dominating development."*** (Appeal ref: APP/X1545/A/06/ 2023805)

8.31 At the Inquiry for the Sixpenny Wood Ltd 10 turbine wind farm at Sixpenny Wood, East Riding of Yorkshire, the Planning Inspector concluded that:

- i. ***"There is no right to a view per se, and any assessment of visual intrusion leading to a finding of material harm must therefore involve extra factors such as undue obtrusiveness, or an overbearing impact, leading to a diminution of conditions at the relevant property to an unacceptable degree."*** (Appeal ref: APP/E2001/A/09/2101851)

8.32 At the Inquiry for the dismantling of 15 turbines and the erection of a 10 turbine wind farm at Carland Cross, Cornwall (Scottish Power Renewables (UK) Ltd), the Planning Inspector concluded as follows:

-
- i. ***"Thus, I do not consider that simply being able to see a turbine or turbines from a particular window or part of the garden of a house is sufficient reason to find the visual impact unacceptable (even though a particular occupier might find it objectionable)." (Appeal ref: APP/D0840/A/09/2103026)***
- 8.33 In the case of the Hockley Farm, Bradwell-on-Sea, Essex (Appeal reference APP/X1545/A/06/2023805), in paragraph 75, the Planning Inspector took the following issues into consideration when determining the appeal in respect of impacts on outlook:
- Separation distances;
 - Orientation of dwellings (main rooms and gardens); and
 - If there is a change to the view it needs to make the properties unattractive properties to live in for harm to be found.
- 8.34 In the decision for Land at Inner Farm, Edithmead, Burnham-on-Sea, Somerset (APP/V3310/A/06/2031158), the issue of the private nature of views from residential properties and the importance of considering such impacts was considered in paragraphs 65 and 66. At paragraph 66 it is stated that:
- i. ***"However, private and public interests may coincide where a proposal would have such a severe adverse impact on the outlook from a property that it would make it a significantly less attractive place to live, as perceived by a reasonable observer without strong views for or against the type of development in question. In such a situation protecting the amenities of a dwelling may be a legitimate and material planning consideration (though also one to be weighed against other such considerations..."***
- 8.35 The Inspector also went on to comment that:
- i. ***"the motion of the blades would in my view be persistently intrusive and potentially disturbing seen from the closest dwellings with a clear view of the proposals."***

8.36 The following matters were considered in determining the effects on residential amenity:

- Extent to which intervening vegetation provides screening;
- Proximity of the property to the wind farm;
- Degree to which the wind turbines would appear dominant and overbearing; and
- Whether the full height of the turbines would be visible.

8.37 The Planning Inspector (in paragraph 67) dismissed the use of a simple distance parameter (in this instance 400-600m) between the property and wind turbines in determining whether the effects would be unacceptable.

8.38 In the inquiry for North of Goveton, Sandy Lane End, Kingsbridge, Devon, (Appeal reference APP/K1128/A/08/2072150), the Planning Inspector considered a number of issues in assessing effects on the living conditions of potentially affected properties:

- Relationship of the property to the turbines (directly facing);
- Possibility of mitigating the impacts through a landscaping scheme; and
- Bulk of the structure.

8.39 In the Planning Inspector's decision for the inquiry at - Thackson's Well Farm, Sewstern Lane, Long Bennington, Newark, Lincolnshire, (Appeal reference APP/E2530/A/08/2073384) the Inspector explored the issue of the orientation of the properties and recognised that some houses, either isolated properties or new development were designed to maximise the open views of the countryside.

8.40 In this context the issues which were used in determining the effect of the wind farm on the outlook of residents were:

- The extent to which the outlook of the property and garden would be affected;
- Intervening built form, including outbuildings or house extensions; and
- Angle of view (oblique or direct).

8.41 In paragraph 66 the Planning Inspector for Land west of Enifer Downs Farm and east of Archers Court Road and Little Pineham Farm, Langdon (Appeal reference APP/X2220/A/08/2071880) noted that:

-
- i. ***"..when turbines are present in such number, size and proximity that they represent an unpleasantly overwhelming and unavoidable presence in main views from a house or garden, there is every likelihood that the property concerned would come to be widely regarded as unattractive and thus unsatisfactory (but not necessarily uninhabitable) place in which to live. It is not in the public interest to create such living conditions where they did not exist before."***
- 8.42 The Planning Inspector at the Land north of Burnthouse Farm, Burnthouse Sidings, Turves public inquiry (Application reference APP/D0515/A/10/2123739) built upon the Enifer Downs Farm decision by stating at paragraph 119 that:
- i. ***"No individual has the right to a particular view but there comes a point when, by virtue of the proximity, size and scale of a given development, a residential property would be rendered so unattractive a place to live that planning permission should be refused. The test of what would be unacceptably unattractive should be an objective test."***
- 8.43 At paragraph 120, the Inspector further defines the threshold for determining unacceptable effects:
- i. ***"There needs to be a degree of harm over and above an identified substantial adverse affect to take a case into the category of refusal in the public interest. Changing the outlook from a property is not sufficient."***
- 8.44 The Inspector considered that the visual component of residential amenity should be assessed "in the round", taking into account factors including the following:
- Distance from the turbines;
 - The orientation, size and layout of the dwelling;
 - Internal circulation;
 - Division between primary and secondary rooms, garden and other amenity space;
 - Arc of view occupied by the wind farm; and

- The availability of screening.

8.45 These views were endorsed by the Secretary of State (SoS) when considering the Inspector's report and recommendations for the recovered appeal. This is set-out at paragraphs 10 and 11 of the SoS decision letter of 6th July 2011 where, in paragraph 10, the SoS says:

- i. **"when assessing the effect on visual outlook, it is helpful pose the question 'would the proposal affect the outlook of these residents to such an extent, i.e. to be so unpleasant, overwhelming and oppressive that this would become an unattractive place to live'?"**

8.46 In the decision for public inquiry into Land at Newlands Farm, Cumwhinton, Carlisle (Application reference APP/E0915/A/09/2101659), the Planning Inspector makes reference to a number of aspects of the development and the relationship to Residential Amenity which include:

- Visual presence of the wind farm including the proportion of the field of view occupied by the wind farm;
- Degree of Separation between the property and the turbines;
- Whether the relationship of the properties to the wind farm is oblique or not; and
- Presence of existing screening in the view.

8.47 The Planning Inspector at the public inquiry for Site at Land at, Airfield Farm, Podington (Application reference APP/K0235/A/09/2108506) tested the scheme against a variety of issues when considering impacts on residential amenity:

- The property was taken to include the house and those areas of garden/patio where residents would sit outside;
- Proximity;
- Whether the turbines would be seen in array from the properties; and
- Degree to which views would be screened.

Summary of Nearby Properties' Visual Amenity

8.48 I consider that there would be no overbearing effects on visual amenity when considered 'in the round' for any of the five nearby properties.

8.49 In general, although the turbine may be prominent in some views from some properties and their curtilages, the turbines would not change the overall appreciation of the underlying and predominantly open, working agricultural landscape, or the open nature of the views. The views would remain rural in nature and the properties concerned would continue to be attractive places in which to live. The wind turbine would only occupy a small proportion of the range of views available from these properties. In conclusion it is considered that the residential visual amenity of these properties would not be unacceptably harmed.

8.50 The residents of the properties may be of the opinion that such effects are adverse/negative and find them unacceptable, although it is recognised that some people consider the effects to be neutral, or even positive. This potential variation in opinion needs to be taken into consideration in the context of an assessment of the overall effect on residential amenity and in the overall planning balance. In conclusion, although in some views from residential properties there may be a significant visual effect, these effects are not judged to be so severe as to be capable of being considered 'overbearing' in relation to visual amenity such that any property or group of properties would be rendered an unattractive place in which to live.

8.51 Having undertaken a thorough assessment of the relationship between the proposed wind turbine and the residential properties in the locality of the turbine, it is considered that the likely visual effects will not result in an overbearing or overwhelming effect on the residential amenity. Views from these properties in essence would remain as a working agricultural landscape with development infrastructure present. These properties would not be unacceptably affected by the proposed wind turbine and that the wind turbine is not considered to have an overbearing or overwhelming effect on the residential visual amenity of the properties. In short, no property would fail the public interest test. I therefore conclude that from this analysis, as an objective assessment, that the residents of the properties would continue to benefit from good living conditions associated with these properties.

Sluidubh (Property 1)

8.52 This property is located immediately alongside and to the south of an unclassified lane and is known as Sluidubh. It is located close to another property (property 2) and at its nearest elevation it lies 630 metres from the proposed turbine. The main

residential part of the property is broadly orientated with its ridgeline running north east south west. The property is two storey and has as an annexe on its northern side, which is single storey in height. The north eastern elevation of the property is two storeys but has no significant principal windows on this elevation but it would be visually unaffected by the proposed turbine.

- 8.53 The south eastern elevation of the property is the principal elevation which is approached from the driveway to the property. This has windows associated with habitable rooms both on ground and first floor as well as the entrance itself to the property. This elevation as it faces away from the turbine has an aspect which is facing south eastwards and would as a consequence be visually unaffected by the proposed turbine.
- 8.54 The south west elevation of the property has an annexe which is single storey in height and faces directly into other out-buildings which are located immediately beyond the residential property itself. These elevations, both the principal gable elevation and the annexe elevation, have no significant outlook as they face onto out-buildings to the south west and would be visually unaffected by the proposed turbine as proposed.
- 8.55 The only elevation which is directly facing and would be affected by the proposed turbine is the north western elevation. At the first floor level of this elevation there is only one small window which faces towards the turbine. This is a small aperture designed more to capture light than to provide the opportunity to view the vista as would be the case with a picture or a large scale format window. At the ground floor the northern part of the elevation is punctuated by a single storey extension with a window on the ground floor of this annexe which faces into the garden and its cartilage and this is framed by a hedgerow. This north western elevation also has a lean-to extending across the southern part of the elevation which is single storey in height. The windows associated with this annexe face into vegetation, hedgerows and treecover affording a limited view from this lean-to. The southern annexe of the property which is single storey has glazed units on the north west elevation facing towards the turbine. From these windows on the north west elevation there is the opportunity to gain views in a north westward direction towards the turbine.
- 8.56 The turbine however would be seen beyond and behind a block of coniferous woodland which would reduce the perceived height of the turbine, screening much of

the tower and lower rotation of the blades. It would be seen in the context of overhead lines on poles in the middle distance. The horizontal and vertical arc of view associated with the single turbine would be very small in the context of the wide open view that is experienced from this property. As a consequence the overall character and appearance of the agricultural landscape would continue to prevail with the proposed turbine in place. The property is located at 630 metres from the turbine, which is over 8 times tip height in terms of separation distance between the turbine and the property itself. As a consequence of this separation distance the proposed turbine would appear modest in scale seen against the horizon and would not have an overbearing affect upon the property. Therefore I conclude that the property would when judged objectively continue to benefit from good living conditions and remain an attractive place to live.

Property 2 – Sluidubh

- 8.57 This property is shown on the plan that identifies nearby residential properties. This property is located just to the south of an unclassified lane at Sluidubh and forms a neighbour to property 1. This property is essentially a 1 ½ storey property with windows at the first floor located in the roof level of the property above the eaves of the roof. The property is broadly orientated north east - south west although is arranged on 3 sides forming a courtyard for the driveway to the south east of the property. It is this courtyard area which forms the approach to the property with its principal elevation on its southern side.
- 8.58 The north eastern part of the residential property forms a double ridgeline of two single storey elements which provide garaging to the property and forms the main part of the north eastern elevation of the property. This together with the north eastern elevation of the residential property itself, would be visually unaffected as they face away from the proposed turbine.
- 8.59 The southern elevation of the garaging and the residential property itself has a south easterly aspect. This is the principal elevation with windows and entrance from the driveway and courtyard. All of this would be visually unaffected as it faces away from the proposed turbine and views of the wider landscape from this elevation would remain unchanged.

8.60 The south west elevation of the property lies at an oblique angle to the proposed turbine and therefore any views from windows on this elevation would be oblique in nature. Windows on this elevation are primarily limited to the ground floor, although there are several dormer windows in the roofscape associated with this elevation. The main orientation of the property would mean that views facing directly out from the habitable rooms would be affected only to a slight degree given that the turbine would only be visible at an oblique angle from these windows and would not be affected to a significant degree.

8.61 The secondary principal elevation to the property faces north westward. This elevation has a number of windows on the ground floor together with several at the first floor level associated with bedrooms. From these windows associated with habitable rooms, there would be the opportunity to gain views of the turbine in the distance on the horizon. The turbine would be seen set behind a coniferous woodland which would reduce the perceived height of the turbine as much of the tower would be screened from view as well as the lower arc of the rotating blades. The property and the windows associated with this elevation would afford wide open expansive views of the farmland and woodland in the middle and far distance. In contrast to this the very narrow arc of view associated with the height and width of the turbine would be very limited in this wide open expansive view of the landscape. Whilst the turbine would be visible as indeed the overhead transmission line and associated pylons are in the landscape, the overall character and appearance of the farmland landscape would continue to prevail with the turbine in place. This property is located at 597 metres from the proposed turbine which equates to in excess of 7 times the tip height of the turbine. As a consequence the vertical angle and horizontal arc of view of the turbine would be very limited in the view of the landscape and would not as a consequence have an over-bearing affect upon the property. Therefore I conclude that the property would, when judged objectively, continue to benefit from good living conditions associated with this property and its garden environment and remain an attractive place to live.

Property 3 – North West Property

8.62 This property is located some 683 metres from the turbine to the nearest elevation of the residential property which equates to a separation distance in excess of 8 times the tip height of the proposed turbine. The north eastern elevation of the property

exhibits windows and an entrance to the property from driveway. Both from the ground floor and first floor level from this elevation views are broadly orientated northwards across the garden and driveway towards treecover associated with a block of woodland. These views would be visually unaffected by the proposed turbine therefore the visual amenity in terms of outlook from the windows on this elevation on the property would be unaffected.

- 8.63 Similarly the west facing elevation which faces over the garden and adjacent farmland would be visually unaffected as views are in the opposite direction to the proposed turbine. This western elevation accommodates windows on the ground and first floor and are associated with the principal habitable rooms. Indeed the western elevation accommodates large format picture windows providing a significantly viewing opportunity across the garden and adjacent landscape with a pond feature in the garden in the foreground. The outlook from these windows would be unaffected by the proposed turbine being in place.
- 8.64 The eastern elevation faces onto the adjacent and un-adopted track which exhibits windows associated with habitable rooms particularly on the ground floor. These face across to an overhead line on poles which is located on the opposite side of the track. Views facing directly out of the windows on this elevation would be primarily unaffected as the turbine is located almost due south of the property and in such circumstances the proposed turbine would only be visible at an oblique angle in views associated with the outlook of this elevation. However in the foreground the view is influenced by the presence of an overhead transmission line and associated electricity pylons extending across the fields immediately to the south of the property.
- 8.65 The open and expansive view across the countryside from these windows would remain with the proposed turbine in place and the turbine would not have an overbearing affect upon the outlook associated with this elevation.
- 8.66 The southern elevation of the property is primarily single storey with a two storey element associated with a gable end. The line of sight southward towards the proposed turbine from windows on this southern elevation would be interrupted by the 1 ½ storey building associated with the garage located immediately to the south of the property. This garage annexe would interrupt southward views significantly screening the proposed turbine from this elevation.

8.67 The separate building immediately to the south of the residential property accommodates garaging and has annexe space at the first floor level. The principal windows associated with this garage unit are orientated westward which would be visually unaffected by the proposed turbine and eastward in which views of the turbine would be seen only at an oblique angle to views and the outlook from this eastern elevation. Given the separation distance of 683 metres from the turbine it would form a very limited horizontal arc of view and vertical angle of view with respect to the property. The current outlook from the annexe to the property affords an open and expansive view of the farmland landscape in which a vertical infrastructure punctuates this view in the form of overhead transmission line pylons.

8.68 In terms of this property the majority of the garden and amenity space is located to the west of the residential building. The southern part of the curtilage is managed as woodland which whilst in a juvenile state at the moment, will continue to develop into mature woodland. This treecover together with the annexe/garage building would screen to a significant extent, views of the proposed turbine located the south of the property.

8.69 The character and appearance of the landscape which informs the outlook associated with this property would prevail with the proposed turbine in place. As a consequence I conclude that the property would, when judged objectively continue to benefit from good living conditions associated with this property remain an attractive place in which to live.

Property 4 - Drummick Bungalow

8.70 This property is located at 505 metres from the proposed turbine which equates to a separation distance in excess of 6 times tip height. The property is single storey. The eastern elevation, whilst it has windows on this elevation, these face into the small curtilage and into a 2 metres high evergreen hedge. The outlook associated with this property and this elevation would be visually unaffected by the proposed turbine.

8.71 Similarly the outlook associated with the windows on the northern elevation of the property would be visually unaffected by the turbine.

- 8.72 The southern elevation has an entrance and two windows associated with habitable rooms that face southward. These face across and into a small garden area and a tall 2 metre high evergreen hedge. It is this vegetation which provides a certain degree of visual enclosure associated with views and the outlook associated with these windows. However, the proposed turbine is located to the south west of this property and therefore the proposed turbine would only be visible at an oblique angle from this southern elevation of the property. The principal direct view from the windows on this elevation would be southward and would continue to benefit from open expansive views across the working farmland. In the middle distance of these views is the overhead transmission lines and associated pylons.
- 8.73 The western elevation of the property faces into an evergreen hedge. Though the windows on this elevation afford westward views over the open and expansive landscape to the west the foreground is punctuated by the presence of a electricity pylon and overhead transmission line cables. As the proposed turbine is located to the south west of the property the turbine would only be visible in oblique views associated with this western elevation. Given the separation distance between the turbine and the property the turbine would only form a very narrow arc of view when seen in the wide panoramic landscape.
- 8.74 Views across the open landscape would continue to remain in place. As a consequence the turbine would not have an over-bearing affect upon the property. Therefore I conclude that the property would, when judged objectively continue to benefit from good living conditions and remains an attractive place to live.

Property 5 – Drummick Farm

- 8.75 This property lies 561 metres from the proposed turbine and as such the separation distance is in excess of 7 times the tip height of the proposed turbine. The eastern elevation of the property has windows on the ground and first floor level which affords open and expansive views eastward from the property over the surrounding farmland. This outlook would be visually unaffected by the proposed turbine being in place.
- 8.76 The northern elevation of the property faces away from the turbine and therefore the outlook associated with the windows on the northern elevation would be unaffected.

These views currently face into a courtyard and a large agricultural building which dominates the northern outlook of this property.

- 8.77 The western elevation faces obliquely towards the proposed turbine, but the ground floor of this elevation accommodates a lean-to which has no fenestration, nor does the gable end of this elevation. Regarding the first floor level windows associated with the western elevation of the building which faces westward across the courtyard, the views from this elevation are terminated by a barn on the opposite side of the farmyard. As a consequence the westerly outlook associated with this property would be unaffected by the proposed turbine.
- 8.78 The southern facade of the property forms the principal elevation with its entrance which is defined by a glazed lean-to structure. There are windows both on the ground and first floor level of this southern elevation which face due south and as a consequence the proposed turbine would theoretically only be visible at an oblique angle from these windows. However, the angle at which the turbine would be seen is interrupted by mature tree cover and vegetation associated with the curtilage of the property together with a storage unit and as a consequence the turbine would not have any significant visual effect upon this elevation. The property is 'an involved property' associated with the proposed wind turbine.
- 8.79 The proposed wind turbine would not have any visually overbearing affect upon this property given the distance and visual relationship between the property and the turbine itself. Therefore, I conclude that the property would, when judged objectively continue to benefit from good living conditions and remains an attractive place to live.

Effect on the Living Conditions of Local Residents in respect of Shadow Flicker

- 8.80 I note that shadow flicker is not a matter raised in the Reasons for Refusal.
- 8.81 The zone within which properties could be potentially affected by shadow flicker covers a distance of 10 rotor diameters from the turbine. In this case that distance extends to 770 metres. Only 5 properties fall within this zone of influence.
- 8.82 To mitigate any potential adverse effects arising from shadow flicker the turbine can be installed with a light meter and shadow flicker timer. This equipment would enable the automatic disabling of the turbine which would otherwise result in shadow flicker for periods of longer than 30 minutes duration. In the absence of UK guidelines on

shadow flicker, these criteria are based on those deemed by other European countries to be acceptable. No significant shadow flicker impact is therefore anticipated.

- 8.83 A recent Government publication by DECC titled 'Update of UK Shadow Flicker Evidence Base' has concluded that within the UK there have not been extensive issues arising from shadow flicker. The study identifies that such mitigation measures as described above have been demonstrated to be successful, and advocates the use of a suitably worded planning condition to ensure that the matter is adequately dealt with should any problem arise.

9. PLANNING POLICY CONTEXT

Planning Policy Context

- 9.1 Perth and Kinross Council issued a Notice of Refusal of planning permission for the erection of a wind turbine and anemometer mast on the 24th May 2012. The refusal notice states three reasons for refusal these are:

1. "As the proposed turbine will have a significant adverse impact on the visual amenity of the area, which is presently enjoyed by a host of receptors including (but not exclusively) existing residential properties and visiting recreational users, the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (visual) amenity from new developments with the landward area, and Environmental and Resource Policy 14 of the Perth and Kinross Structure Plan 2003 which seeks to protect existing local environmental quality from inappropriate renewable energy developments".

2. "As the proposed turbine will potentially have a significant adverse impact on the residential amenity of existing residential properties (by virtue of the turbines appearance and scale when viewed from their properties), the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (residential) amenity from new developments within the landward area".

3. "The approval of this proposal would establish an undesirable precedent for similar sized developments within the local area, which would be to the detriment of the overall visual character of the area, and which in turn could potentially undermine (and weaken) the established Development Plan policies."

- 9.2 The accompanying Planning Statement will cover the relevant planning policies in more detail. Where relevant this Landscape Statement addresses the policies that are specific to the proposed development in terms of Landscape.

National Planning Policy

- 9.3 The National Planning Framework 2 (NPF2) was published in June 2009 and is a strategy for the long term development of Scotland's towns, cities and rural areas. It is very supportive of renewable energy, highlighting the important role that onshore wind farms have played, and will continue to play, in the roll out of renewables across Scotland. It outlines the renewable energy generation targets set by the Scottish Government (which have since been increased further) and acknowledges the importance of onshore wind farms in meeting this and future targets (of NPF2).
- 9.4 Scottish Planning Policy (SPP) is the statement of the Scottish Governments view on the purpose of planning, setting out core principles and subject planning policies.
- 9.5 The SPP reiterates many of the provisions and objectives as set out within the NPF2, but also provides detailed "subject policies" to guide certain types of developments.

Strathearn Local Plan 2001

Policy 2 – Development Criteria

- 9.6 Policy 2 is concerned with the protecting local character:

All developments will also be judged against the follow criteria:

- The sites should have a landscape framework capable of absorbing if necessary, screening the development and where opportunities for landscape enhancement will sought;
- In the case of built development, regard should be had to scale, colour and density of existing development within the locality;
- **The development should be compatible with its surroundings in land use and should not result in a significant loss of amenity to the local community;**
- The road network should be capable of absorbing the additional traffic generated by the development and a satisfactory access onto the network provided;
- Where applicable, there should be sufficient spare capacity in drainage, water and education services to cater for the new development;
- The site should be large enough to accommodate the development satisfactorily in site planning terms;
- Buildings and layouts of new developments should be designed so as to be energy efficient; and

- **Built developments should where possible be built within those settlements that are subject of inset maps. (My Emphasis)**

- 9.7 The proposal as it relates to Policy 2 is sited in an area that has no Landscape Designation or Historic Heritage and as far as the appellant is aware has had no objection from Scottish Natural Heritage or any other 'Statutory Consultees'. There are no listed buildings or scheduled monuments within 2km of the proposed turbine and the settlement pattern is one of dispersed farmsteads and small clusters of cottages.
- 9.8 Wind turbines by their very nature are difficult to screen with landscaping and planting. Mitigation is best achieved by retaining existing landscape features and by replacing and enhancing landscape features which are affected by the development. The proposal allows for the planting of a native tree mix to screen views from the properties to the immediate south of the proposed turbine. In an earlier section in this statement it has already been noted that the proposal would have no significant effect on the existing landscape features.
- 9.9 The landscape in the immediate vicinity of the proposed turbine is characterised by tall vertical structures in the form of pylons that cross the site. The proposal has taken note of this and the proposed turbine is sited in close proximity and allied to existing pylons.
- 9.10 In terms of loss of amenity to the local community whilst the proposed turbine would be visible and in some locations, conspicuous up to 5 km, the overall character and appearance of the landscape would remain materially unchanged. The surrounding environment is a settled, predominantly working agricultural landscape despite the fact that the landscape is punctuated with pylons and telegraph poles. Its overriding visual character is still one of a rural landscape. This experience of the area's visual amenity would not materially change with the proposed turbine in place.

Perth and Kinross Structure Plan 2003/ Tayplan 2012

- 9.11 Reason for refusal 1 makes reference to Environmental and Resource Policy 14 of the Perth and Kinross Structure Plan 2003. The 2003 Structure Plan has been superseded by the Tayplan which was adopted in June 2012, Policy 6 of the Tayplan now address Energy Infrastructure in the following terms:

Policy 6 – Energy and Waste/Resource Management Infrastructure

A. Local Development Plans should identify areas that are suitable for different forms of renewable heat and electricity infrastructure and for waste/resource management infrastructure or criteria to support this; including, where appropriate, land for process industries (e.g. the co-location/ proximity of surplus heat producers with heat users).

B. Beyond community or small scale facilities waste/resource management infrastructure is most likely to be focussed within or close to the Dundee and/or Perth Core Areas (identified in Policy 1).

C. Local Development Plans and development proposals should ensure that all areas of search, allocated sites, routes and decisions on development proposals for energy and waste/resource management infrastructure have been justified, at a minimum, on the basis of these considerations:

- The specific land take requirements associated with the infrastructure technology and associated statutory safety exclusion zones;
- Waste/resource management proposals are justified against the Scottish Government's Zero Waste Plan and support the delivery of the waste/resource management hierarchy;
- Proximity of resources (e.g. woodland, wind or waste material); and to users/customers, grid connections and distribution networks for the heat, power or physical materials and waste products, where appropriate;
- Anticipated effects of construction and operation on air quality, emissions, noise, odour, surface and ground water pollution, drainage, waste disposal, radar installations and flight paths, and, of nuisance impacts on off-site properties;
- Sensitivity of landscapes (informed by landscape character assessments and other work), the water environment, biodiversity, geo-diversity, habitats, tourism and listed/scheduled buildings and structures;
- Impacts of associated new grid connections and distribution or access infrastructure;

- Cumulative impacts of the scale and massing of multiple developments, including existing infrastructure; and,
- Impacts upon neighbouring planning authorities (both within and outwith TAYplan).

9.12 The proposed development would retain existing landscape elements. The site does not sit within any Landscape Designations, National Scenic Areas or Historic Landscapes and therefore causes no material change to any of these designations. The siting of the turbine respects the character of the local and wider natural, semi natural and manmade environments.

9.13 The proposed turbine has been located in close proximity to the existing national grid network, thus minimising any significant effects in terms of grid connection. The turbine is located in close proximity to existing pylons which reduces the effect of the visual envelope of tall structures in the landscape.

9.14 Due to separation distance and intervening vegetation between nearby listed buildings and the proposed turbine, there would be no significant effects on any of these designations.

9.15 It has been established in the LVIA submitted with the application and in agreement with Perth and Kinross Council that there would be no cumulative effects in relation to the proposed turbine.

9.16 The proposed development is to be constructed on existing working farmland and will not materially affect the working running of Drummick Farm. The wind turbine will aid in creating renewable electricity to help reduce the carbon footprint of the farm.

9.17 The single medium scale turbine will not create significant levels of noise or light pollution and by its very nature will have no effect on the air, land, soil or water of the local area.

10. OTHER MATTERS

3rd Party Objections

Landscape Character

- 10.1 The effects of the proposed turbine on the character of the landscape are discussed in length in section 5 of this report.

Visual Impact on Highland Boundary Fault

- 10.2 Several objector letters make reference to the Highland Boundary Fault. Over the years there has been a number of significant developments within 0-10km of the Highland Boundary Fault, these are shown in appendix 5. The developments include telecoms masts, wind turbines pumps and pylons.
- 10.3 As a single turbine there would be views of the landscape beyond and as a consequence views would not terminate on the turbine itself but upon the landscape beyond in many cases. Therefore whilst the wind turbine would be visible in the foreground of views towards the Highland Boundary Fault from some locations to the south, it would be seen in the context of other tall vertical infrastructure which lies in line with the view. The turbine would not materially detract from the receptor's visual appreciation for the landscape beyond and its character.

Sma' Glen

- 10.4 Several objector letters make reference to views towards the Sma' Glen from public roads. A look at the ZTV shows that visibility of the proposed turbine from the A85 and A822 is limited and for the majority of the length of the roads, the proposed turbine is not visible.
- 10.5 In views from the B8063 I would accept that where there are occasional lines of sight and visibility between the highway and the proposed wind turbine that where visible the turbine would be visually evident when in close proximity to the receptor.
- 10.6 However, lengths of this road are flanked by treecover. Consequently, the motorist will regularly find that views are channelled along the orientation of the highway because of the flanking vegetation and/or changes in the local topography.

- 10.7 The orientation of the roadway and the direction of travel will determine the primary channel of view. As a consequence, given the orientation of the public roadway , many views would be channelled away from the proposed wind turbine along the orientation and line of the public roadway and thereby only allow limited opportunities to gain views of the wind turbine from oblique angles, which would often fall within peripheral vision.
- 10.8 Due to the changes in orientation of the road and the location of the proposed turbine it is unlikely that there will be any simultaneous visibility of the Sma' Glen and the proposed turbine within the same line of sight. Visibility of the proposed turbine and the Sma' Glen would rather be sequential where the viewer would see the proposed turbine prior to viewing the Sma' Glen.
- 10.9 In my opinion opportunities to view the proposed turbine against the back drop of the Sma' Glen are limited from public highways and the proposed turbine would not have a significant effect on the visual appreciation of the Sma' Glen.

Glenalmond College

- 10.10 Glenalmond College is located approximately 2.5km north east of the proposed turbine, the site itself is surrounded to the south west by a line of mature trees which would provide screening of the proposed turbine from the college building itself. This screening continues along either side of the B8063 westward, the screening would also prevent views of the turbine seen against the backdrop of the college.
- 10.11 Due to the effects of screening by landform and intervening vegetation between Glenalmond College and the proposed turbine there will be no significant effect on the setting or visual amenity of the college building or playing fields.

Glenalmond College Golf Course

- 10.12 The Glenalmond College golf course is located approximately 1km to the north east of the proposed turbine. A closer look at the layout of the 9 hole golf course shows that it is predominantly orientated to the east – west. The proposed turbine would be behind the direction of play for approximately half of the round of the golf and therefore would not be in the immediate view of golfers. For the holes where the proposed turbine would be in the direction of the play the turbine itself would be seen

at an oblique angle of view from the golfers and in peripheral vision as they orientate themselves tee to green. At 1km a medium scale turbine of the size proposed at Drummick would not have an overbearing effect of the golf course nor would its moving blades be in direct line of site from tee to green.

- 10.13 Existing vegetation that runs along portions of the southern boundary of the golf course would ensure that from a number of locations on the golf course the proposed turbine would not be visible in the view.
- 10.14 A look at wireframes, taken from several locations along fairways of the golf course shows that topography rises between the course and the proposed turbine meaning that from locations in the east portion of the golf course only the turbine blades are visible above the skyline, thus reducing the visual influence.
- 10.15 Having looked at the potential effects of the proposed turbine on the visual amenity and setting of the Glenalmond Golf Course, I conclude in my professional opinion that while the proposed turbine would have an adverse effect from certain holes within the course these effects would not be so significant as to be harmful to the overall enjoyment of the Golf Course.

11. SUMMARY AND CONCLUSIONS

- 11.1 In light of the findings of the landscape and visual assessment of the Drummick wind turbine proposal submitted as part of the planning application and my own review and analysis and having considered these in relation to reason for refusals 1 and 2, I have come to the following conclusions as set out below.
- 11.2 The landscape and visual assessment has been carried out in accordance with the best practice guidance with regard to the likely landscape and visual effects which would arise from the proposals. The visualisations are accurate and a fair representation of the proposal and are an appropriate reference in making judgements and decisions concerning the Drummick wind turbine.
- 11.3 I consider that the proposed wind turbine could be effectively located to ensure that there would be no significant loss of landscape elements on site and that there would be no effect upon landscape elements located off site.
- 11.4 Inevitably the wind turbine would have some effect on the landscape. At the local level, within 2 km the effect upon visual amenity would be significant as it would influence the appearance and the character of the landscape. At close quarters and within 1 km the immediate local agricultural environment would be characterised as a wind farm landscape and the development will have a significant effect on the character of the landscape at a local level up to 2 km. I do not consider that the development will give rise to any unacceptable visual effects on the local and wider landscape within which it is located.
- 11.5 The wind turbine would be located in an area of generally undulating lowland with ridges. This is a working agricultural landscape punctuated by a variety of built and transport infrastructure and is unremarkable in its character. It is not subject to any non statutory or statutory designations.
- 11.6 The proposed wind turbine would be located in a working and settled agricultural landscape. Whilst there are no sizeable settlements in the immediate vicinity of the site there are the villages of Methven and Glenalmond, together with a number of individual and isolated properties which punctuate the landscape and are situated nearby. My detailed visual analysis has demonstrated that the proposed turbine would be located at an appropriate distance to ensure that the proposed turbine

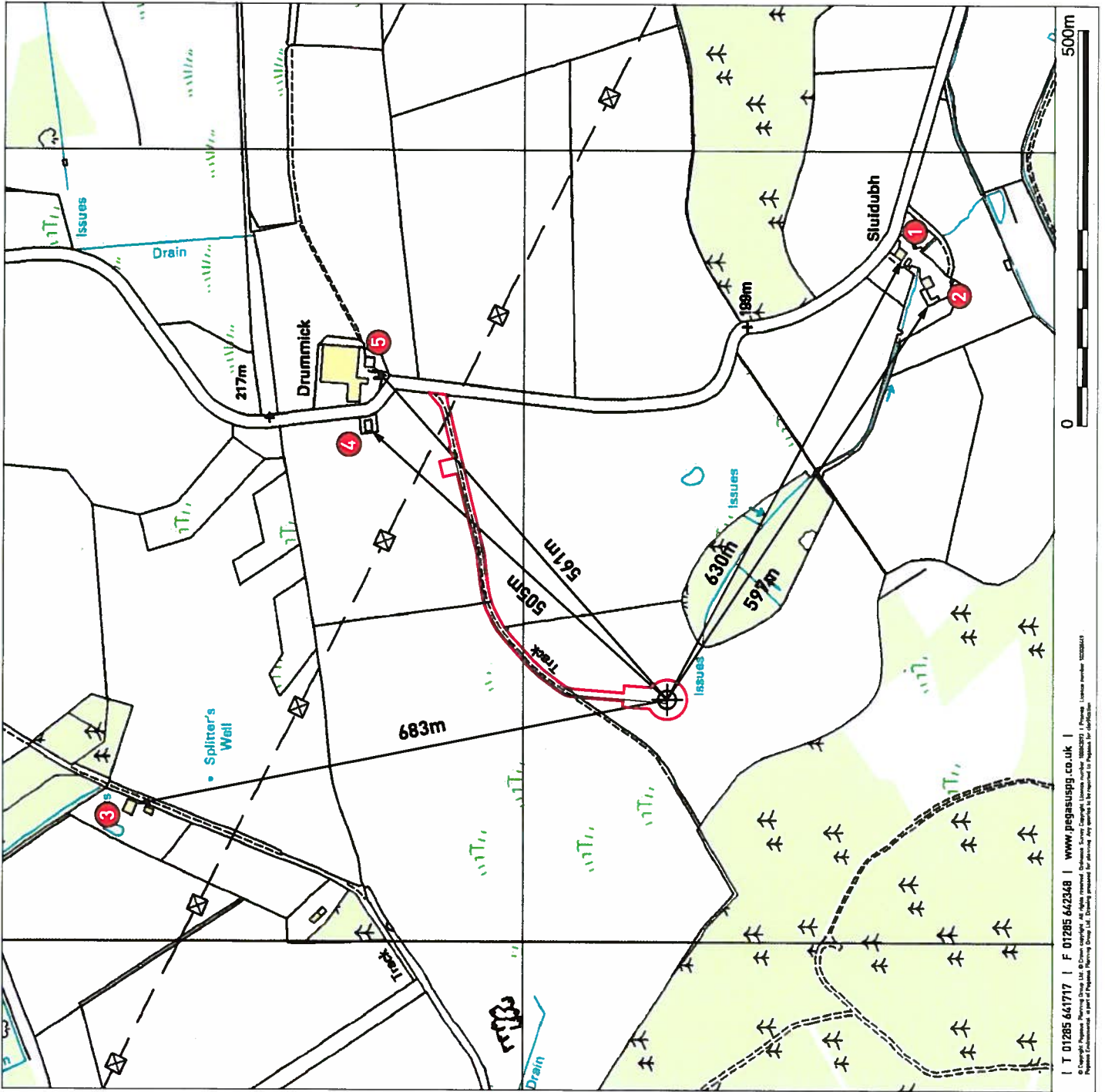
would not have an overbearing or overwhelming effect upon the residential visual amenity of nearby properties (or their occupants). With the wind turbine in place, it would not render these properties unattractive as places in which to live, when assessed objectively and in the public interest.

- 11.7 Across the wider landscape, whilst the turbine would be visible and in some locations, conspicuous up to 5 km, the overall character and appearance of the landscape would remain materially unchanged. The surrounding environment is a settled, predominantly working agricultural landscape despite the fact that the landscape is punctuated with development and transport infrastructure. Its overriding character, as defined in the various landscape character appraisals, is still one of a rural landscape. This characterisation would continue to prevail and be the case with the proposed turbine in place as visual effects would be limited and would not generate any unacceptable effects upon the landscape.
- 11.8 Members of the public primarily gain an appreciation of the countryside's visual amenity from public rights of way and highways. These routes which pass through the countryside currently provide sequential visual experiences which are frequently punctuated by built infrastructure and wind energy development. This experience of the area's visual amenity would not materially change with the proposed turbine in place.
- 11.9 Consequently, I do not consider that the proposal would in general terms give rise to any unacceptable effects on views either locally or from the wider landscape.
- 11.10 Having undertaken a review of the landscape and visual assessment and having prepared my own evidence I consider that the proposed Drummick wind turbine would not give rise to unacceptable landscape and visual effects and would be an appropriate form and scale of development that could be successfully accommodated within the local and wider context of the lowlands.
- 11.11 I consider the proposal is well sited and consequently could be effectively accommodated in the landscape and as a result would contribute to the national need for renewable energy without material harm to the local environment.
- 11.12 On the basis of my assessment I am of the view that the significant effects of the wind turbine in landscape and visual terms will be limited to a relatively small area of

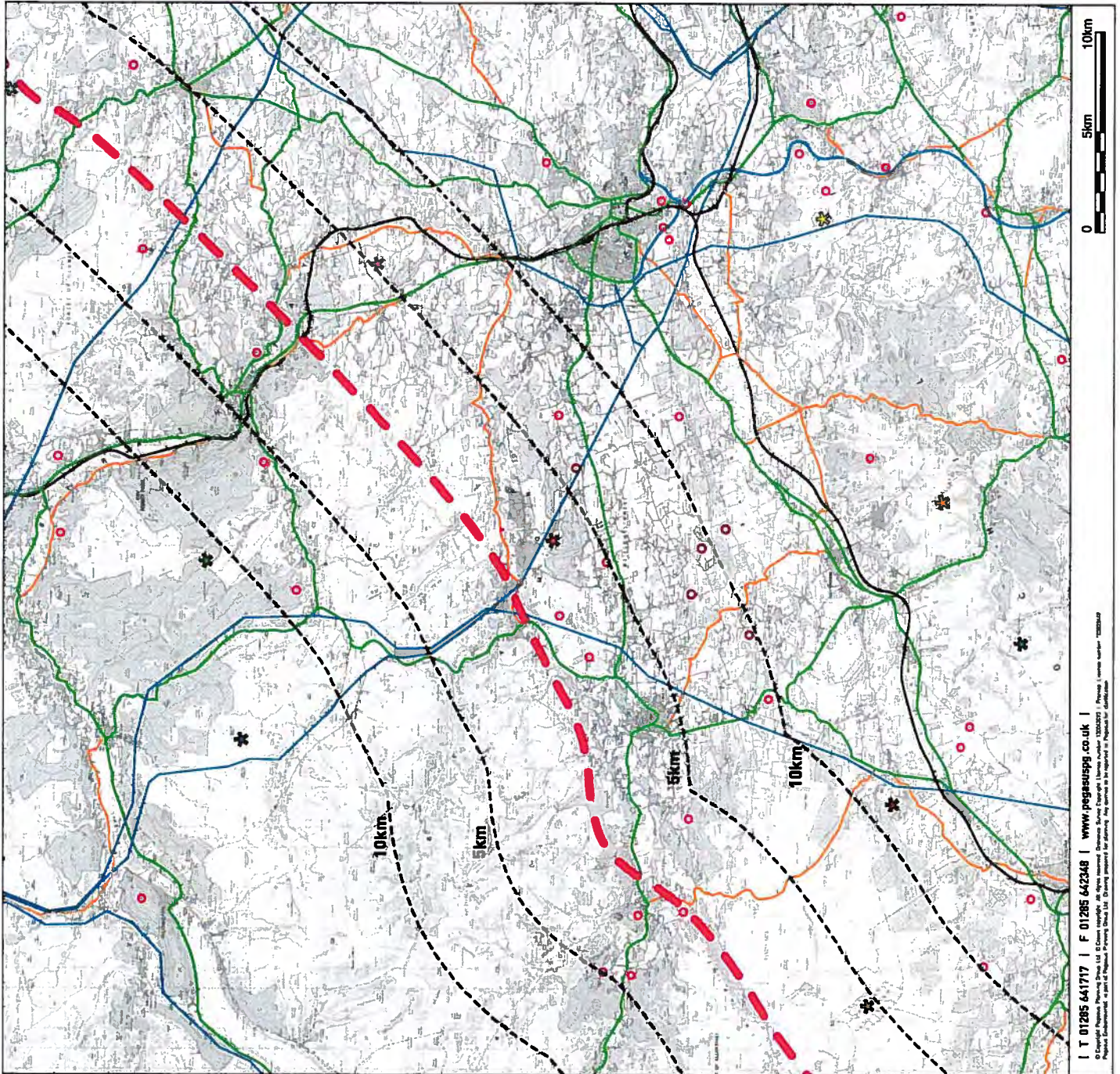
the local landscape around the site, as described above. Given that landscape and visual effects are an inevitable consequence of this type of development, but which have been minimised through the choice of this site, I consider that the Drummick proposal is a well considered project, on an appropriate site. I do not accept, therefore, that the reasons for refusals put forward by PKC are well founded in landscape and visual terms.

- 11.13 For the reasons as stated above it is my view, as an independent expert landscape witness, that on landscape and visual grounds there are no reasons to refuse planning permission for the Drummick wind turbine.

APPENDIX 1
NEARBY RESIDENTIAL PROPERTIES PLAN



APPENDIX 2
HIGHLAND BOUNDARY FAULT LINE AND DEVELOPMENT CONTEXT PLAN



PERTH AND KINROSS COUNCIL

Clearwinds Limited
c/o Pegasus Planning Group
FAO Peter Atkin
Pegasus House
Querns Business Centre
Whitworth Road
Cirencester
GL7 1RT

Pullar House
35 Kinnoull Street
PERTH
PH1 5GD


Date 24th May 2012

TOWN AND COUNTRY PLANNING (SCOTLAND) ACT

Application Number: **12/00401/FLL**

I am directed by the Planning Authority under the Town and Country Planning (Scotland) Acts currently in force, to refuse your application registered on 26th March 2012 for permission for **Erection of a wind turbine and an anemometer mast Land 550 Metres South West Of Drumick Farm Glenalmond** for the reasons undernoted.



 Development Quality Manager

Reasons for Refusal

1. As the proposed turbine will have a significant adverse impact on the visual amenity of the area, which is presently enjoyed by a host of receptors including (but not exclusively) existing residential properties and visiting recreational users, the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (visual) amenity from new developments within the landward area, and Environmental and Resource Policy 14 of the Perth and Kinross Structure Plan 2003 which seeks to protect existing local environmental quality from inappropriate renewable energy developments.

2. As the proposed turbine will potentially have a significant adverse impact on the residential amenity of existing residential properties (by virtue of the turbines appearance and scale when viewed from their properties), the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (residential) amenity from new developments within the landward area.
3. The approval of this proposal would establish an undesirable precedent for similar sized developments within the local area, which would be to the detriment of the overall visual character of the area, and which in turn could potentially undermine (and weaken) the established Development Plan relevant policies.

Justification

The proposal is not in accordance with the Development Plan and there are no material reasons which justify departing from the Development Plan

Notes

The plans relating to this decision are listed below and are displayed on Perth and Kinross Council's website at www.pkc.gov.uk "Online Planning Applications" page

Plan Reference

12/00401/1	12/00401/7
12/00401/2	12/00401/8
12/00401/3	12/00401/9
12/00401/4	12/00401/10
12/00401/5	12/00401/11
12/00401/6	12/00401/12

PA.CIR.C.0362

5th March 2012

The Development Quality Manager
The Environment Service
Perth & Kinross Council
Pullar House
35 Kinnoull Street
Perth
PH1 5DG

Dear Sir/Madam,

Application for Planning Permission Town and Country Planning (Scotland) Act 1997

Proposed erection of a single 77m wind turbine with a maximum rated capacity of up to 900kW for a period of 25 years and erection of an anemometry mast of up to 50m height for a period of 18 months.

On behalf of our client ClearWinds Ltd., please find enclosed a planning application for the above proposed development.

In support of this application we enclose 1 hard copy and 1 electronic copy of the following required information:

- Schedule of application drawings, comprising;
 - Site Location Plan (C.0362_17-D)
 - Site Context Plan (C.0362_03-B)
 - Site Layout Plan (29827/35740.2)
 - Turbine Elevation Plan (29827)
 - Turbine Foundation Plan (29827)
 - Control Building Plan (29827)
 - Mat Mast Elevation Plan (C.0362_22-A)
- Planning Documentation, comprising:
 - 1 Application Form
 - Planning Statement
 - Design & Access Statement
 - Statement of Public Consultation
- Environmental Reports Compendium, comprising:
 - Construction Report
 - Ecology Reports (Phase 1 Habitat Survey, Bat Report & Ornithology Report)
 - Landscape and Visual Impact Assessment Report, including photomontages – note: 1 original set of to scale photomontages is included within a separate A3 file.
 - Archaeology and Heritage Report
 - Transport and Access Report
 - Noise Report
 - Aviation Report

Pegasus House
Querns Business Centre
Cirencester
Gloucestershire
GL7 1RT

T 01285 641717

F 01285 642348

Also at:
Birmingham
Bracknell
Bristol
Cambridge
Leeds
Manchester
Nottingham

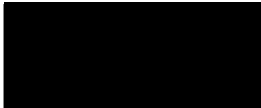
Pegasus Planning Group is the trading name of Pegasus Planning Group Limited, registered in England and Wales under number 07277000

Registered Office:
Pegasus House,
Querns Business Centre,
Whitworth Road, Cirencester,
Gloucestershire, GL7 1RT

o Telecommunications Report

We enclose a cheque for £2,552.00 to cover the relevant application fee. I trust you find the above and enclosed acceptable to allow you to register this application and progress it towards determination. However, should you have any queries or require any further information, please do not hesitate to contact me at the above address. I would be grateful if you would provide Pegasus Planning Group and Mr. W. Clare of ClearWinds Ltd. with acknowledgement of the application documentation and a receipt for the cheque for both parties' records.

Yours faithfully



Peter Atkin MRTPI
Planner
peter.atkin@pegasuspg.co.uk

Encs.

Cc. Mr. W. Clare ClearWinds Ltd.

APPLICATION FOR PLANNING PERMISSION

Town and Country Planning (Scotland) Act 1997
The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008

Please refer to the accompanying Guidance Notes when completing this application
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	<input type="text"/>	Ref No.	CIR.C.0362
Forename	<input type="text"/>	Forename	Peter
Surname	<input type="text"/>	Surname	Atkin
Company Name	Clearwinds Ltd	Company Name	Pegasus Planning Group
Building No./Name	<input type="text"/>	Building No./Name	Pegasus House
Address Line 1	C/O Agent	Address Line 1	Querns Business Centre
Address Line 2	<input type="text"/>	Address Line 2	Whitworth Road
Town/City	<input type="text"/>	Town/City	Cirencester
Postcode	<input type="text"/>	Postcode	GL7 1RT
Telephone	<input type="text"/>	Telephone	01285 64 17 17
Mobile	<input type="text"/>	Mobile	<input type="text"/>
Fax	<input type="text"/>	Fax	<input type="text"/>
Email	<input type="text"/>	Email	peter.atkin@pegasuspg.co.uk
3. Postal Address or Location of Proposed Development (please include postcode)			
Drummick Farm, Glenalmond, Perth, PH1 3SF			
NB. If you do not have a full site address please identify the location of the site(s) in your accompanying documentation.			
4. Type of Application			
What is the application for? Please select one of the following:			
Planning Permission		<input checked="" type="checkbox"/>	
Planning Permission in Principle		<input type="checkbox"/>	
Further Application*		<input type="checkbox"/>	
Application for Approval of Matters Specified in Conditions*		<input type="checkbox"/>	
Application for Mineral Works**		<input type="checkbox"/>	
NB. A 'further application' may be e.g. development that has not yet commenced and where a time limit has been imposed a renewal of planning permission or a modification, variation or removal of a planning condition.			
*Please provide a reference number of the previous application and date when permission was granted:			
Reference No:	<input type="text"/>	Date:	<input type="text"/>

****Please note that if you are applying for planning permission for mineral works your planning authority may have a separate form or require additional information.**

5. Description of the Proposal

Please describe the proposal including any change of use:

Proposed Erection of a single 77m wind turbine with a maximum rated capacity of up to 900kW for a period of 25 years and erection of an anemometer mast up to 50m height for a period of 18 months.

Is this a temporary permission?

Yes ☐ No ☒

If yes, please state how long permission is required for and why:

Have the works already been started or completed?

Yes ☐ No ☒

If yes, please state date of completion, or if not completed, the start date:

Date started:

Date completed:

If yes, please explain why work has already taken place in advance of making this application

6. Pre-Application Discussion

Have you received any advice from the planning authority in relation to this proposal?

Yes ☒ No ☐

If yes, please provide details about the advice below:

In what format was the advice given?

Meeting ☒ Telephone call ☐ Letter ☐ Email ☐

Have you agreed or are you discussing a Processing Agreement with the planning authority? Yes ☐ No ☒

Please provide a description of the advice you were given and who you received the advice from:

Name:

Date:

Ref No.:

General advice, scope of supporting information required, EIA Screening / Scoping

7. Site Area

Please state the site area in either hectares or square metres:

Hectares (ha):

Square Metre (sq.m.)

8. Existing Use

Please describe the current or most recent use:

Agricultural Land

9. Access and Parking

Are you proposing a new altered vehicle access to or from a public road? Yes ☐ No ☒

If yes, please show in your drawings the position of any existing, altered or new access and explain the changes you propose to make. You should also show existing footpaths and note if there will be any impact on these.

Are you proposing any changes to public paths, public rights of way or affecting any public rights of access? Yes ☐ No ☒

If yes, please show on your drawings the position of any affected areas and explain the changes you propose to make, including arrangements for continuing or alternative public access.

How many vehicle parking spaces (garaging and open parking) currently exist on the application site?

N/A

How many vehicle parking spaces (garaging and open parking) do you propose on the site? (i.e. the total number of existing spaces plus any new spaces)

N/A

Please show on your drawings the position of existing and proposed parking spaces and specify if these are to be allocated for particular types of vehicles (e.g. parking for disabled people, coaches, HGV vehicles, etc.)

10. Water Supply and Drainage Arrangements

Will your proposals require new or altered water supply or drainage arrangements? Yes ☐ No ☒

Are you proposing to connect to the public drainage network (e.g. to an existing sewer?)

Yes, connecting to a public drainage network ☐
No, proposing to make private drainage arrangements ☐
Not applicable – only arrangement for water supply required ☒

What private arrangements are you proposing for the new/altered septic tank?

Discharge to land via soakaway ☐
Discharge to watercourse(s) (including partial soakaway) ☐
Discharge to coastal waters ☐

Please show more details on your plans and supporting information

What private arrangements are you proposing?
Treatment/Additional treatment (relates to package sewer treatment plants, or passive sewage treatment such as a reed bed) ☐
Other private drainage arrangement (such as a chemical toilets or composting toilets) ☐

Please show more details on your plans and supporting information.

Do your proposals make provision for sustainable drainage of surface water? Yes ☐ No ☒

Note:- Please include details of SUDS arrangements on your plans

Are you proposing to connect to the public water supply network?

Yes ☐ No ☒

If no, using a private water supply, please show on plans the supply and all works needed to provide it (on or off site)

11. Assessment of Flood Risk

Is the site within an area of known risk of flooding?

Yes ☐ No ☒

If the site is within an area of known risk of flooding you may need to submit a Flood Risk Assessment before your application can be determined. You may wish to contact your planning authority or SEPA for advice on what information may be required.

Do you think your proposal may increase the flood risk elsewhere? Yes ☐ No ☒ Don't Know ☐

If yes, briefly describe how the risk of flooding might be increased elsewhere.

12. Trees

Are there any trees on or adjacent to the application site?

Yes ☐ No ☒

If yes, please show on drawings any trees (including known protected trees) and their canopy spread as they relate to the proposed site and indicate if any are to be cut back or felled.

13. Waste Storage and Collection

Do the plans incorporate areas to store and aid the collection of waste? (including recycling)

Yes ☐ No ☒

If yes, please provide details and illustrate on plans.

If no, please provide details as to why no provision for refuse/recycling storage is being made:

14. Residential Units Including Conversion

Does your proposal include new or additional houses and/or flats?

Yes ☐ No ☒

If yes how many units do you propose in total?

Please provide full details of the number and types of units on the plan. Additional information may be provided in a supporting statement.

15. For all types of non housing development – new floorspace proposed

Does your proposal alter or create non-residential floorspace?

Yes ☐ No ☒

If yes, please provide details below:

Use type:

If you are extending a building, please provide details of existing gross floorspace (sq.m):

Proposed gross floorspace (sq.m.):

Please provide details of internal floorspace(sq.m)

Net trading space:

Non-trading space:

Total net floorspace:

16. Schedule 3 Development

Does the proposal involve a class of development listed in Schedule 3 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008?

Yes ☐ No ☒ Don't Know ☐

If yes, your proposal will additionally have to be advertised in a newspaper circulating in your area. Your planning authority will do this on your behalf but may charge a fee. Please contact your planning authority for advice on planning fees.

17. Planning Service Employee/Elected Member Interest

Are you / the applicant / the applicant's spouse or partner, a member of staff within the planning service or an elected member of the planning authority?

Yes ☐ No ☒

Or, are you / the applicant / the applicant's spouse or partner a close relative of a member of staff in the planning service or elected member of the planning authority?

Yes ☐ No ☒

If you have answered yes please provide details:

DECLARATION

I, the applicant/agent certify that this is an application for planning permission. The accompanying plans/drawings and additional information are provided as part of this application. I hereby confirm that the information given in this form is true and accurate to the best of my knowledge.

I, the applicant/agent hereby certify that the attached Land Ownership Certificate has been completed ☒

I, the applicant /agent hereby certify that requisite notice has been given to other land owners and /or agricultural tenants

Yes ☒ No ☐ N/A ☐

Signature:

Name:

PETER ATKIN

Date:

05/03/2012

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.

LAND OWNERSHIP CERTIFICATES

Town and Country Planning (Scotland) Act 1997
Regulation 15 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008

CERTIFICATE A, B, C OR CERTIFICATE D MUST BE COMPLETED BY ALL APPLICANTS

CERTIFICATE A

Certificate A is for use where the applicant is the only owner of the land to which the application relates and none of the land is agricultural land.

I hereby certify that -

- (1) No person other than myself was owner of any part of the land to which the application relates at the beginning of the period of 21 days ending with the date of the application. ☐
- (2) None of the land to which the application relates constitutes or forms part of agricultural land. ☐

Signed:

On behalf of:

Date:

CERTIFICATE B

Certificate B is for use where the applicant is not the owner or sole owner of the land to which the application relates and/or where the land is agricultural land and where all owners/agricultural tenants have been identified.

I hereby certify that -

- (1) I have served notice on every person other than myself who, at the beginning of the period of 21 days ending with the date of the application was owner of any part of the land to which the application relates. These persons are: ☒

Name	Address	Date of Service of Notice
Mrs E.C.Doig	East Buchanty Glenalmond Perth PH1 3SG	05/03/2012

- (2) None of the land to which the application relates constitutes or forms part of agricultural land ☐

or

- (3) The land or part of the land to which the application relates constitutes or forms part of agricultural land and I have served notice on every person other than myself who, at the beginning of the period of 21 days ending with the date of the application was an agricultural tenant. These persons are: ☒

Name	Address	Date of Service of Notice
Mrs Jacqueline Dunlop	Drummick Farm House, Glenalmond, Perth PH1 3SG	05/03/2012
Mr Harvey Morrison	Drummick Farm Cottage, Glenalmond, Perth PH1 3SG	05/03/2012

CERTIFICATE C

Certificate C is for use where the applicant is not the owner or sole owner of the land to which the application relates and/or where the land is agricultural land and where it has not been possible to identify ALL or ANY owners/agricultural tenants.

- (1) I have been unable to serve notice on **every** person other than myself who, at the beginning of the period of 21 days ending with the date of the application was owner of any part of the land to which the application relates. ☐

or

- (2) I have been unable to serve notice on **any** person other than myself who, at the beginning of the period of 21 days ending with the date of the accompanying application, was owner of any part of the land to which the application relates. ☐

- (3) None of the land to which the application relates constitutes or forms part of an agricultural holding.

or

- (4) The land or part of the land to which the application relates constitutes or forms part of an agricultural holding and I have been unable to serve notice on any person other than myself who, at the beginning of the period of 21 days ending with the date of the accompanying application was an agricultural tenant. ☐

or

- (5) The land or part of the land to which the application relates constitutes or forms part of an agricultural holding I have served notice on each of the following persons other than myself who, at the beginning of the period of 21 days ending with the date of the application was an agricultural tenant. These persons are: ☐

Name	Address	Date of Service of Notice

- (6) I have taken reasonable steps, as listed below, to ascertain the names and addresses of all other owners or agricultural tenants and have been unable to do so.

Steps taken:

CERTIFICATE D
Certificate D

Certificate D is for use where the application is for mineral development.

- (1) No person other than myself _____ was an owner of any part of the land to which the application relates at the beginning of the period of 21 days ending with the date of the accompanying application. ☐

or

- (2) I have _____ served notice on each of the following persons other than myself _____ who, at the beginning of the period of 21 days ending with the date of the accompanying application, was to the applicant's knowledge, the owner, of any part of the land to which the application relates. These persons are: ☐

Name	Address	Date of Service of Notice

- (3) None of the land to which the application relates constitutes or forms part of an agricultural holding. ☐

or

- (4) The land or part of the land to which the application relates constitutes or forms part of an agricultural holding and I have _____ served notice on each of the following persons other than myself _____ who, at the beginning of the period of 21 days ending with the date of the application, was an agricultural tenant. ☐

- (5) Notice of the application as set out below has been published and displayed by public notice ☐

Signed:

On behalf of:*

Date:

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

NOTICE TO OWNERS AND AGRICULTURAL TENANTS

Town and Country Planning (Scotland) Act 1997
Regulation 15 (1) of the Town and Country Planning (Development Management Procedure)
(Scotland) Regulations 2008

Name [Note 1]	Mrs E.C.Doig
Address	East Buchanty
	Glenalmond
	Perth
	PH1 3SG

Proposed development at [Note 2]	Drummick Farm, Glenalmond
	Perth
	PH1 3SG

Notice is hereby given that an application is being made to

[Note 3]	Perth & Kinross	Council by	Pegasus Planning Group
----------	-----------------	------------	------------------------


For planning permission to [Note 4]

Proposed erection of a 77m Wind Turbine and 50m Anemometer Mast

If you wish to obtain further information on the application or to make representations about the application, you should contact the Council at [Note 5]

The Development Quality Manager, Pullar House, 35 Kinnoull Street, Perth, PH1 5DG

(The grant of planning permission does not affect owners' rights to retain and dispose of their property unless there is some provision to the contrary in an agreement or lease. The grant of planning permission for non-agricultural development may affect agricultural tenants security of tenure.)

Signed	 (PETER ATKIN)
On behalf of	Pegasus Planning Group
Date	05/03/2012

*Delete where appropriate

[Note 1] – Insert name and address of owner or agricultural tenants

[Note 2] – Insert address or location of proposed development.

[Note 3] – Insert name of planning authority.

[Note 4] – Insert description of proposed development.

[Note 5] – Insert planning authority address.



PLANNING SUPPORTING STATEMENT

PROPOSED WIND TURBINE

DRUMMICK GLENALMOND

Pegasus Planning Group
Pegasus House,
Querns Business Centre
Whitworth Road
Cirencester
Glos
GL7 1RT

Telephone: (01285) 641717 Facsimile: (01285) 642348

PPG Ref: PA/CIR.C.0362

Date: 22nd February 2012

COPYRIGHT

The contents of this document must not be copied or reproduced in whole or in part without the written consent of **Pegasus Planning Group Ltd**

CONTENTS:

Page No:

1.	INTRODUCTION	1
2.	APPLICATION SITE AND SURROUNDINGS	3
3.	DESCRIPTION OF PROPOSED DEVELOPMENT	4
4.	PLANNING POLICY ASSESSMENT	5
5.	OTHER MATERIAL CONSIDERATIONS – THE CLIMATE CHANGE IMPERATIVE, ENERGY POLICY AND APPEAL PRECEDENTS	15
6.	KEY PLANNING CONSIDERATIONS	21
7.	SUMMARY AND CONCLUSIONS	29

1. INTRODUCTION

- 1.1 This Planning Supporting Statement has been prepared by Pegasus Planning Group Ltd on behalf of ClearWinds Ltd. (hereafter referred to as the applicant) in support of the accompanying planning application for the erection of a single wind turbine and met mast at Drummick, near Glenalmond within the boundary of Perth & Kinross Council.
- 1.2 This Report identifies the context and the need for the proposed development and includes an assessment of how it accords with relevant planning policy and against other material planning considerations.
- 1.3 This Planning Supporting Statement therefore takes the following form:
- Section 2 describes the application site and surroundings;
 - Section 3 describes the development proposals;
 - Section 4 reviews the planning policy considerations relevant to the determination of the application;
 - Section 5 considers additional material considerations relevant to the determination of the application;
 - Section 6 analyses the main planning considerations raised by the proposed development.
 - Section 7 concludes that planning permission should be granted.
- 1.4 Pegasus Planning Group Ltd submitted a request for a Screening Opinion under Regulation 6 of the Environmental Impact Assessment (Scotland) Regulations 2011 to Perth & Kinross Council on 23rd September 2011.
- 1.5 The Local Planning Authority (LPA) responded on 13th October 2011 and considered that the proposals would not constitute Environmental Impact Assessment (EIA) development and would therefore not be required to be supported with an accompanying Environmental Statement. The application before the Council is nonetheless submitted with additional supporting information necessary to consider those issues pertinent to the application.

1.6 The application is for full planning permission and is accompanied by the following documents:

- i) 1APP Application form and Ownership Certificates;
- ii) Schedule of Drawings;
- iii) Planning Supporting Statement;
- iv) Design and Access Statement;
- v) Compendium of Environmental Reports, comprising:
 - o Cumulative Considerations;
 - o Construction;
 - o Ecology & Ornithology;
 - o Landscape and Visual;
 - o Archaeology and Cultural Heritage
 - o Noise;
 - o Flood Risk & Drainage
 - o Aviation;
 - o Telecommunications; and
 - o Transport

2. APPLICATION SITE AND SURROUNDINGS

- 2.1 A Site Location Plan is submitted with this application for reference.
- 2.2 The Proposed turbine development area comprises an area of land of approximately 0.8ha and is located in a rural area between Glenalmond approximately 1km to the north and Keilour approximately 2.5km south/south-east. Buchanty Burn lies a little further west from the site area.
- 2.3 The site is presently in agricultural use and does not hold any particular conservation or biodiversity value. A search of “sensitive areas” as defined by the EIA Regulations confirms that the site is not located within any such “sensitive area”. The site is bordered to the south by woodland and to further agricultural land to the immediate north, east and west.
- 2.4 There are no Sites of Special Scientific Interest (SSSI) within or adjacent to the site; the closest being Methven Moss over 5km south east, a second SSSI (Connachan Marsh) is 8km south west. There are no National Parks within or close to the site – the nearest being Loch Lomond and The Trossachs National Park over 66km to the west. The site is not within or close to any World Heritage Sites or Scheduled Monuments (SMs). The closest SMs are Fendoch Burn Roman Fort, Sair Law burial mound and Inchaffray Abbey approximately 4km away. The Site is not within a National Scenic Area, the closest being River Tay (Dunkeld) approximately 15km north of the site. There are no Ramsar Sites, Special Protection Areas (SPAs) or Special Areas of Conservation (SAC) (European designations under the Habitats Regulations) within or adjacent to the site. The closest SAC is Methven Moss 5km away. The closest Ramsar Site and SPA is South Tayside Goose Roosts approximately 10km south east.
- 2.5 An unclassified road passes east of the site area in a north – south direction, leading to Drummick.
- 2.6 Existing land use within the site comprises grazing land which is surrounded by pasture land and forestry within the wider area. Overhead cables lie east of the turbine location at a section between Easter Buchanty and Bellour.

3. DESCRIPTION OF PROPOSED DEVELOPMENT

- 3.1 The development proposals are for the erection of a single 77m wind turbine.
- 3.2 It is envisaged that the proposed wind turbine would be operational for a duration of 25 years in order to benefit from the Feed-in Tariff (FiT) programme which will see renewable energy fed into the grid as well as consumed on site, thus representing a contribution to the UK's renewable energy targets.
- 3.3 The turbine will have a hub height of 50m, with a maximum height to blade tip of 77m. The rotor diameter will be 54m.
- 3.4 The exterior finish of the proposed turbine will be non-reflective matt white/grey as is typical of existing wind turbines throughout the UK.
- 3.5 In addition, it is proposed to erect a 50m anemometer mast for a temporary period of 18 months to record local wind speeds.
- 3.6 Further details of the design and appearance of the wind turbine and anemometer mast is set out in the accompanying Design and Access Statement and associated technical drawings submitted with this application.

4. PLANNING POLICY ASSESSMENT

- 4.1 Planning applications are required to be determined in accordance with the Development Plan unless material considerations indicate otherwise.
- 4.2 This section sets out the key planning policy guidance contained within the following hierarchy of Development Plan and Guidance Documents:
- i) National Planning Framework for Scotland 2 (June 2009);
 - ii) Scottish Planning Policy (February 2010);
 - iii) Perth & Kinross Structure Plan (June 2003);
 - iv) Perth & Kinross Local Development Plan (January 2012)

National Planning Policy

National Planning Framework for Scotland 2 (June 2009)

- 4.3 The NPF2 guides Scotland's development to 2030, setting out strategic development priorities to support the Scottish Government's central purpose – sustainable economic growth. The Planning etc. (Scotland) Act 2006 puts this and future iterations of the National Planning Framework on a statutory footing.
- 4.4 The NPF2 states that one of the principal challenges relates to climate change; reducing the greenhouse gas emissions which contribute to it and adapting to changes in our environment which are already becoming apparent. Substantial reductions in greenhouse gas emissions will be necessary to minimise the impacts of climate change. The UK and Scottish Government's are taking an international lead by introducing ambitious statutory emission reduction targets through, respectively, the UK Climate Change Act and the Scottish Climate Change Bill (see section 5 below for details).
- 4.5 Paragraph 26 of the NPF2 continues that tackling climate, reducing dependence on finite fossil fuels and security of energy supply are some of the major global challenges of our time. Addressing these challenges will demand profound changes in the way we produce, distribute and use energy over the coming decades.
- 4.6 The European Union has responded by committing to deriving 20% of the energy it uses from renewable sources by 2020. The NPF confirms that the Scottish

Government supports this objective and has in place its own, higher target for electricity generated from renewable sources.

- 4.7 Paragraph 145 confirms that the Scottish Government is fully committed to establishing Scotland as a leading location for the development of renewable energy technology and an energy exporter over the long term.

Scottish Planning Policy (February 2010)

- 4.8 Scottish Planning Policy (SPP) is the statement of the Scottish Government's policy on nationally important land use planning matters.
- 4.9 The SPP reiterates many of the provisions and objectives as set out within the NPF2, but also provides detailed 'subject policies' to guide certain types of developments. The following subject policies are of relevance to the current application before the Council:

i) Rural Development:

- 4.10 Paragraph 92 of the SPP states that the aim of 'rural development' should be to enable development in all rural areas which supports prosperous and sustainable communities whilst protecting and enhancing environmental quality.
- 4.11 Paragraph 93 continues that the strategy for rural development should respond to the respond to the specific circumstances in an area whilst reflecting the overarching aim of supporting diversification and growth of the rural economy. In particular, the SPP also states that developments which provide (amongst other things) community benefits (such as the proposed development) should be encouraged.

ii) Landscape and Natural Heritage

- 4.12 The SPP states that Planning Authorities should take a broader approach to landscape and natural heritage than just conserving designated or protected sites and species, taking into account the ecosystems and natural processes in their area. A strategic approach to natural heritage in which wildlife sites and corridors, landscape features, watercourses, and areas of open space are linked together in integrated habitat networks can make an important contribution to the maintenance and enhancement of biodiversity and to allowing ecosystems and natural processes to adapt and respond to changes in climate. Planning Authorities should seek to

prevent further fragmentation or isolation of habitats and identify opportunities to restore links which have been broken. Where possible, planning authorities should seek benefits for species and habitats from new development including the restoration of degraded habitats.

- 4.13 The SPP continues that different landscape will have a different capacity to accommodate new development, and the siting and design of development should be informed by local landscape character. Landscapes and the natural heritage are sensitive to inappropriate development and planning authorities should ensure that potential effects, including the cumulative effects of incremental changes are considered when preparing development plans and deciding planning applications.
- 4.14 While the protection of the landscape and natural heritage may sometimes impose constraints on development, with careful planning and design the potential for conflict can be minimised and the potential for enhancement maximised. However, there will be occasions where the sensitivity of the site or the nature or scale of the proposed development is such that the development should not be permitted. Statutory natural heritage designations are important considerations where they are directly or indirectly affected by a development proposals. However, designation does not necessarily imply a prohibition on development.
- 4.15 It is therefore important to reiterate that the proposed development does not lie within an area designated for its landscape or ecological value and as such is considered to be a more suitable site to support such development, particular as this development is supported by necessary assessments and surveys to overcome any uncertainty or constraints as considered by the Council.
- 4.16 In regards to the presence of protected species, the SPP states that many species are legally protected and their presence or potential presence is an important consideration in decisions on planning applications. Although their presence rarely imposed an absolute block on development, mitigation measures are often needed and the layout, design and timing of works may be affected. If there is evidence to suggest that a protected species is present on site or may be affected by a proposed development, their presence must be established, the requirements of the species factored into the planning and design of the development and any likely impact of the species fully considered prior to the determination of the planning application.

4.17 The SPP also states that planning permission should not be granted for development that would be likely to have an adverse effect on a European protected species (as listed in Annex IV of the Habitats Directive (Directive 92/43/EEC)) unless the planning authority is satisfied that:

- There is no satisfactory alternative; and
- The development is required for preserving public health or public safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.

iii) Renewable Energy:

4.18 The SPP confirms that the commitment to increase the amount of electricity generated from renewable sources is a vital part of the response to climate change. Renewable energy generation will contribute to more secure and diverse energy supplies and support sustainable economic growth. The current target is for 50% of Scotland's electricity to be generated from renewable sources by 2020 and 11% of heat demand to be met from renewable sources.

4.19 The SPP states that Planning Authorities should support the development of a diverse range of renewable energy technologies, guide development to appropriate locations and provide clarity on the issues that will be taken into account when specific proposals are assessed. Factors relevant to the consideration of applications will depend on the scale of the development and its relationship with the surrounding area, but are likely to include impact on the landscape, historic environment, natural heritage and water environment, amenity and communities, and any cumulative impacts that are likely to arise.

4.20 Specifically in relation to proposed wind turbines the SPP states that Planning Authorities should support the development of wind turbines/farms in locations where the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed. Development Plans should provide a clear indication of the potential, for development of wind farms of all scales, and should set out the criteria that will be considered in deciding applications for all wind farm developments. The criteria will vary depending on the scale of development and its relationship to the characteristics of the surrounding area, but are likely to include:

- Landscape and visual impact;
- Effects on the natural heritage and historic environment;
- Contribution of the development to renewable energy generation targets;
- Effect on the local and national economy and tourism and recreation interests;
- Benefits and disbenefits for communities;
- Aviation and telecommunications;
- Noise and shadow flicker;
- Cumulative impact

4.21 Paragraph 188 continues that the design and location of any wind farm development should reflect the scale and character of the landscape. The location of turbines should be considered carefully to ensure that the landscape and visual impact is minimised.

Regional Planning Policy

Adopted Perth and Kinross Structure Plan (June 2003)

4.22 The Adopted Structure Plan (2003) provides a broad strategic land use planning guidance to 2020. The planning policies relevant to the development proposals are as follows:

Strategy 2: The Lowland Area

4.23 The strategy encourages, amongst other things, the economic use of minerals, renewable energy and forestry in support of rural diversification.

Environment and Resources Policy 1

4.24 The Council will seek to safeguard the long-term diversity and sustainability of species and natural and semi-natural habitats in Perth and Kinross.

Environment and Resources Policy 3

- 4.25 Proposed developments should not compromise the conservation objectives and overall integrity of National Scenic Areas unless there is a proven public interest where social or economic considerations outweigh the scenic quality and integrity of the area and development cannot be met in other less damaging locations.

Environment and Resources Policy 14

- 4.26 The policy states that Proposals for the development of renewable energy schemes will be supported where they are considered environmentally acceptable and where their energy contribution and benefits in reducing pollution outweigh any significant adverse effects on local environmental quality. Community based renewable energy developments in particular will be encouraged. Proposals for renewable energy schemes will be assessed against the following criteria:

- The immediate and wider impact of the proposed development on the landscape and wildlife resource;
- The need to protect features and areas of natural, cultural, historical and archaeological interest;
- The specific benefits that the proposal would bring to the local community and/or Perth and Kinross;
- The cumulative effects of similar developments on the local area.

- 4.27 An environmental assessment will normally be required for large-scale schemes and Local Plans will provide more detailed guidance particularly for wind farm developments and other renewable energy technologies.

Local Planning Policy

Perth & Kinross Proposed Plan (January 2012)

- 4.28 The newly adopted Perth & Kinross Proposed Plan provides the local planning guidance for development in the area. Those policies of interest to the determination of this application are as follows:

Policy PM1: Placemaking

- 4.29 The policy states that development must contribute positively, to the quality of the surrounding built and natural environment. All development should be planned and designed with reference to climate change, mitigation and adaptation.

Policy PM2: Design Statements

- 4.30 The policy states that Design Statements will normally need to accompany a planning application if the development covers an area greater than 0.5 hectares, or affects the character and/or appearance of a Conservation Area, Historic Garden, Designed Landscape, or the setting of a Listed Building or Scheduled Monument.

Policy NE1D: European Protected Species

- 4.31 Planning permission will not be granted for development that would, either individually or cumulatively, be likely to have an adverse effect on European protected species unless the Council as Planning Authority is satisfied that:

- a) There is no satisfactory alternative; and
- b) The development is required for preserving public health or public safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.

- 4.32 In no circumstances can a development be approved which would be detrimental to the maintenance of the population of a European protected species at a favourable conservation status in its natural range.

- 4.33 Planning permission will also not be granted for development that would be likely to have an adverse effect on species protected under the Wildlife and Countryside Act 1981 (as amended) unless the Council as Planning Authority is satisfied that:

- c) The development is required for preserving public health or safety, and, in the case of development affecting a species of protected bird;
- d) There is no other satisfactory solution.

Policy ER1A: Renewable and Low Carbon Energy Generation (New Proposals)

4.34 Proposals for the utilisation, distribution and development of renewable and low carbon sources of energy, including large-scale freestanding installations, will be supported where they are well related to the resources that are needed for their operation. In assessing such proposals the following factors will be considered:

- a) The individual or cumulative effects on biodiversity, landscape character, visual integrity, the historic environment, cultural heritage, tranquil qualities, wilderness qualities, water resources and the residential amenity of the surrounding area;
- b) The contribution of the proposed development towards meeting carbon reduction targets;
- c) The connection to the electricity distribution or transmission system;
- d) The transport implications, and in particular the scale and nature of traffic likely to be generated, and its implications for site access, road capacity, road safety, and the environment generally.
- e) The hill tracks and borrow pits associated with any development;
- f) The effects on carbon rich soils;
- g) Any positive or negative effects they may have on the local or Perth & Kinross economy either individually or cumulatively;
- h) The reasons why the favoured choice over other alternative sites has been selected.

Policy ER6: Managing Future Landscape Change to Conserve and Enhance the Diversity and Quality of the Area's Landscapes

4.35 Development and land use should be compatible with the distinctive characteristics and features of Perth & Kinross's landscapes. Accordingly, development proposals will be required to conserve and enhance the landscape qualities of Perth & Kinross. They will need to demonstrate that either in the case of individual developments, or when cumulatively considered alongside other existing or proposed developments;

- a) They do not erode local distinctiveness, diversity and quality of Perth & Kinross's landscape character areas, the historic and cultural dimension of the

area's landscapes, visual and scenic qualities of the landscape, or the quality of landscape experience;

- b) They safeguard views, viewpoints and landmarks from development that would detract from their visual integrity, identity or scenic quality;
- c) They safeguard the tranquil qualities of the area's landscapes;
- d) They safeguard the relative wildness of the area's landscapes;
- e) They provide high quality standards in landscape design, including landscape enhancement and mitigation schemes when there is an associated impact on a landscape's qualities;
- f) They incorporate measures for protecting and enhancing the ecological, geological or geomorphological, archaeological, historic, cultural and visual amenity elements of the landscape, and
- g) They conserve the experience of the night sky in less developed areas of Perth & Kinross through design solutions with low light impact.

Policy EP8: Noise Pollution

- 4.36 There will be a presumption against the siting of development proposals which will generate high levels of noise in the locality of existing or proposed noise sensitive land uses and similarly against the locating of noise sensitive uses near to sources of noise generation.

Supplementary Planning Guidance

Energy Proposals in Perth & Kinross SPG (May 2005)

- 4.37 This SPG provides additional guidance for applicants and the Council in developing and determining proposals for renewable energy generation. In particular the SPG provides advice (which largely mimics the above referenced policy documents in relation to:
- Landscape Impact;
 - Visual Impact;

- Cumulative Effects;
- Biodiversity and Ornithological Interests;
- Operational Impacts;
- Water Resources;
- Aviation Interests;
- Decommissioning and Site Re-instatement

5. OTHER MATERIAL CONSIDERATIONS – THE CLIMATE CHANGE IMPERATIVE, ENERGY POLICY AND APPEAL PRECEDENTS

Global Warming and Climate Change

- 5.1 Many analyses of the climate change problem, now including the UN Climate Change Conference in Bali (December 2007) and Cancun (December 2010) and the Stern Review (2006), have underlined the need to act now to reduce carbon emissions. Renewable energy is one of the few supply-side options that can make a major difference to emissions in the short term in the UK.

The Stern Review – Financial Implications of Global Warming

- 5.2 The government-commissioned Stern Review into the financial impact of global warming was published in October 2006 and made hard-hitting statements about the human, environmental and economic costs of climate change.
- 5.3 Sir Nicholas Stern, a former World Bank economist, said in his 700-page report that industrial countries cannot afford not to take action on climate change. He warned that dealing with the floods, storms and rising sea levels caused by global warming could plunge the world into an economic crisis similar to the Great Depression in the 1930's. He said that although dealing with climate change could cost one per cent of world GDP, not doing anything could cost 20 times more. The Report states:

“Delaying action, even by a decade or two, will take us into dangerous territory. We must not let this window of opportunity close. There is still time to avoid the worst impacts of climate change, if we act now and act internationally. Governments, businesses and individuals all need to work together to respond to the challenge. Strong, deliberate policy choices by governments are essential to motivate change.”

- 5.4 This message from Stern has been welcomed across the political spectrum.
- 5.5 Indeed following the Climate talks at Cancun, Mexico (December 2010) the Climate Change Minister Chris Huhne said in a ministerial speech to parliament that *“a global climate deal is in the UK's national interest and Cancun shows other countries also want to get on with getting an international deal”*. He continued that, *“expectations*

have been exceeded and a global deal on climate change is now back on track. We've got to use this momentum to make urgent progress and lock down that deal – a deal that will benefit our environment and our economies”.

- 5.6 Following on from Chris Huhne's speech, the Climate Change Minister (Greg Barker) added:

“Cancun will send a strong signal of confidence to business investing billions in the new global green economy. British companies are poised to reap the huge advantage of being the first movers in this rapidly expanding market. We will be working in partnership with the private sector to drive home that opportunity.”

- 5.7 As such it can be seen that the focus on climate change, its causes and solutions, is very much a political heavyweight issue with significant steps being made towards its resolution. This momentum now needs to be transferred into practice with the promotion and development of renewable energy schemes at the local level.

European Energy Policy

- 5.8 At a European level, there is the agreed commitment to reduce carbon emissions by 20% by 2020, compared to 1990 levels. Following the Energy Review Report in 2006, the European Council agreed to a European strategy to further improve energy security and to reduce carbon emissions. In March 2007, it was agreed to commit to:

- Saving 20% of the EU's energy consumption by 2020 compared to current projections; and
- A binding target of reducing carbon emissions by 20% by 2020 and by 30% in the context of international action.

- 5.9 The European Commission published the 20 20 by 2020 package in January 2008 and the EU Climate and Energy package was formally agreed in April 2009. This package commits the European Union (EU) to the 20% reduction in its carbon emissions and to achieving a target of deriving 20% of the EU's final energy consumption from renewable sources by 2020.

- 5.10 The renewables target is outlined in the Commission's Directive on the promotion of the use of energy from renewable sources. In order to achieve the overall EU renewable energy target of 20% the proposal includes individual targets for each Member State. The UK's legally binding obligation is 15% of energy coming from renewable sources by 2020.

UK Energy Policy - Energy White Paper (2007)

- 5.11 Published in May 2007 "*Meeting the Challenge – The Energy White Paper*" establishes the government's energy strategy for the foreseeable future. The document builds on the themes and issues raised in the Energy Review. A clear statement of Government policy, the strategy set down in this document contains a number of key elements of relevance to the consideration of this planning application. Section 5.3 of the White Paper addresses policy on renewables and starts with a simple statement.

"Renewable energy has a key role to play in reducing carbon emissions and achieving security of supply."

- 5.12 The White Paper recognises the progress which renewable energy has made to reducing emissions but goes on to address directly the barriers that it notes are slowing the rate of renewable deployment in the UK in both the short and long term. Under the heading of 'planning' the White Paper sets down how the government expects the planning system to respond. In relation to commercial wind energy developments the government's actions are as follows:

- Underlining that applicants will no longer have to demonstrate either the overall need for renewable energy or for their particular proposal to be sited in a particular location; and
- Giving a clear steer to planning professionals and local authority decision makers, that in considering applications they should look favourably on renewable energy developments.

- 5.13 The White Paper goes on to place into policy the "Statement of Need" previously published in the energy review. The statement states:

"We remain committed to the important role renewables has to play in helping the UK meet its energy policy goals. In this

publication we are reiterating previous commitments we have made, not least in the 2003 Energy White Paper on the importance of renewable generation and the supporting infrastructure. We intend this to reconfirm the UK Government policy context for planning and consent decisions on renewable generation projects. As highlighted in the July 2006 Energy Review Report 150, the UK faces difficult challenges in meeting its energy policy goals. Renewable energy as a source of low carbon, indigenous electricity generation is central to reducing emissions and maintaining the reliability of our energy supplies at a time when our indigenous reserves of fossil fuels are declining more rapidly than expected. A regulatory environment that enables the development of appropriately sited renewable projects, and allows the UK to realise its extensive renewable resources, is vital if we are to make real progress towards our challenging goals.

New renewable projects may not always appear to convey any particular local benefit, but they provide crucial national benefits. Individual renewable projects are part of a growing proportion of low carbon generation that provides benefits shared by all communities both through reduced emissions and more diverse supplies of energy, which helps the reliability of our supplies. This factor is a material consideration to which all participants in the planning system should give significant weight, when considering renewable proposals. These wider benefits are not always immediately visible to the specific locality in which the project is sited. However, the benefits to society and the wider economy as a whole are significant and this must be reflected in the weight given to these considerations by decision makers in reaching their decisions.

If we are to maintain a rigorous planning system that does not disincentivise investment in renewable generation, it must also enable decisions to be taken in reasonable time.

Decision makers should ensure that planning applications for renewable energy development are dealt with expeditiously while addressing the relevant issues.

- 5.14 In June 2011, the '**Climate Change Act** became law. This set legally binding targets in reducing greenhouse gas emissions of at least 80% by 2050. It also sets a world-leading interim target for a 42 per cent cut in emissions by 2020 against a 1990 baseline.
- 5.15 The Scottish Government is committed to promoting the increased use of renewable energy sources. This commitment recognises renewables' potential to support economic growth. It also provides new opportunities to enhance our manufacturing capacity and to provide new employment, not least in the remote and rural areas. This Government has set clear targets for renewable electricity. **The First Minister wants renewable sources to generate the equivalent of 100 per cent of Scotland's gross annual electricity consumption by 2020. Similarly, a target has been set for renewables sources to provide the equivalent of 11 per cent of Scotland's heat demand by 2020.**
- 5.16 The Government wants targets to be exceeded rather than merely met, and not to be viewed as a cap on what renewables can deliver. It is important that momentum towards the 2020 target and beyond is maintained. This will require many more technologies to start playing a major role - for example, marine energy and biomass energy. The 2020 Routemap for Renewable Energy in Scotland presents actions which are focussed on targets, within the current development of UK regulatory support, arguing constructively for the UK Government to ensure that such support matches Scotland's ambitions.
- 5.17 The main driver behind renewable electricity development in Scotland, now and over the coming years, is the Renewables Obligation (Scotland), or ROS. This mechanism places an obligation on electricity suppliers to provide an increasing amount of their electricity supplied from eligible renewable sources. The targets should be met by as wide a range of renewable sources as possible.

Appeal Precedents

5.18 Although each site should be considered on its own merits there are numerous high profile appeal decisions for a varying array and scale of wind turbine developments throughout the UK. Several themes arise within the Inspectors conclusions for these schemes which are of potential relevance to this application, including:

- The significant weight afforded to the wider environmental, economic and social benefits arising from a renewable energy scheme;
- Whereby visual harm is outweighed by the application of renewable energy policy; and
- The acceptability in terms of cumulative impact of proposals of significantly larger scale than that currently proposed.

6. KEY PLANNING CONSIDERATIONS

- 6.1 This section provides an assessment of the key planning considerations raised by the proposals.

The Need for Renewable Energy

- 6.2 It is HM Government policy that there is no requirement to prove an overall need for a renewable energy development. This is clearly stated in the National Planning Framework for Scotland 2 and SPP at the national level.
- 6.3 There is a tendency to overlook this starting point. Effectively it means that there is a presumption in favour of schemes which generate renewable energy unless there are significant objections to their introduction; this applies in different ways to different technologies and the weight to be attached to issues will vary depending upon the geographical location and the associated weight to be attached to constraints in that area.
- 6.4 This presumption arises not just because renewable power is a sustainable energy source in its own right but because HM Government has made it clear that it sees carbon reduction; energy security and the associated climate change agenda as being the most significant environmental problems which we face as a society today. The development proposals will therefore provide a small but valuable step towards meeting the Government targets.
- 6.5 It is therefore clear from the plethora of national and international laws, legislation and objectives that the need and political support for renewable energy schemes is incontrovertible.
- 6.6 The development proposals are considered to meet those key sustainability objectives as outlined above and supported at the local level. At a higher level, the development proposals are considered to conform to the national and international objectives towards the transition to a low-carbon economy. The development proposals will therefore make a small but valuable contribution towards the following high level policy objectives:
- Reduction in CO₂ emissions;
 - Increase of electricity generated from renewable sources;

- Mitigate against climate change; and
- Ensure security of energy supply.

6.7 It is considered that significant weight should be applied to the considerable high level national and international political support for renewable energy schemes and the wider environmental, economic and social benefits they provide.

Planning Policy Support

6.8 The site lies within the open countryside. There is a presumption that development in the open countryside is controlled to protect the value of the countryside and the intrinsic beauty and amenity value it provides.

6.9 The development proposals are considered to be acceptable in the first instance within the open countryside as they represent only a relatively minor change to the wider landscape whilst supporting the diversification of the rural economy by providing investment in new employment opportunities and providing a vital community benefit fund to assist rural communities.

6.10 The development proposals are strongly supported by planning policy at national, regional and local levels, especially through SPP and the Perth & Kinross Development Plan which supports the growth of renewable energy developments in suitable locations, taking into account the environmental constraints of the site.

6.11 In accordance with National Guidance and the Development Plan it is considered that the wider environmental benefits associated with the increased production of energy from renewable sources greatly outweigh any adverse impacts the development may have on the surrounding countryside and should be given significant weight in favour of any decision by the Council.

6.12 The proposed development is supported by Planning Policy at all levels whereby renewable energy is actively promoted as a key solution towards mitigating against the impacts of climate change and advancing the wider objectives of sustainable development. SPP states that tackling climate change is a key Government priority and as such development such as those proposed in this Statement, which will contribute positively to the delivery of sustainable planning objectives should be supported.

- 6.13 Of significant importance to these proposals is the legally binding requirement of the UK Government (including Scotland) to meet its own targets for renewable energy generation.
- 6.14 Through the Climate Change Act 2011 Scotland is committed to reducing CO₂ emissions by 80% by 2050, with real progress being made by 2020. In order to achieve these ambitious targets the Government set out the contributions renewable energy generation should make in its Renewable Energy Roadmap (2011). The Paper identified the need to radically increase renewable energy use in the UK as part of an overall strategy for tackling climate change and to meet the UK's obligation to meet its legally binding target to ensure 15% of our energy comes from renewable sources by 2020.
- 6.15 It is considered that the proposals would make a modest but valuable contribution to meeting the challenging target for the production from renewable energy sources in the region. The contribution to meeting energy targets and the effect that this would have in tackling the urgent challenge of climate change represents, on its own, a compelling argument in support of the proposed development.

Suitability of the Site for Renewable Energy Generation

- 6.16 The application site consists of agricultural land. It is considered that the loss of a relatively small portion of the field for the purposes of erecting the proposed wind turbine would have a minimal impact on the overall productivity of the farm estate. Indeed, farm operations during the lifespan can still take place right up to and under the turbine. The turbine would be operational for a period of 25 years after which time the schemes future would be reconsidered by the LPA and the developed portions of the field could return to full agricultural use in the longer term.
- 6.17 The development proposals are also designed to maximise the exposure of the turbine to the commercially viable wind speeds in the area in order to secure the maximum electricity generating power whilst at the same time being sympathetic to the setting of the application site within the countryside. The height of the turbine at 77m is justified by the need to maximise the electricity generating power of the site in order to ensure the viability of the scheme. Viability is a significant material consideration that should be given the proper weight in any decision to grant planning consent. As such, the erection of the turbine is not considered to represent an imposing development within the wider countryside whilst representing an

opportunity to utilise the abundant natural wind resources in the locality consistent with national planning policy. In addition, It is considered that the proposals are appropriate in terms of scale and massing.

- 6.18 The site supports commercially viable wind speeds and is not located within any environmentally sensitive areas as defined within the EIA Regulations and as such, under SPP the application for renewable energy generation should be considered favourably in the first instance. As such, it is considered that the development proposals represent a unique opportunity in a suitable location to make a small but valuable contribution to the UK's binding renewable energy targets whilst being sensitive to the surrounding environmental assets.

Landscape and Visual Impact

- 6.19 There is a general presumption within planning policy against development within the countryside to protect its rural character and among other things the diversity of its landscapes. However, it is considered that the significant sustainable credentials of the proposals outweigh any potential harm and provide a significant case to allow development within the countryside in this location.
- 6.20 Notwithstanding the strong presumption in favour of renewable energy development previously considered, the landscape and visual impacts of the development proposals have been investigated as part of this application. It is important to note that the site is not located within any statutorily designated landscape areas and as such the associated restrictive policies do not apply to this application.
- 6.21 The landscape and visual effects have been assessed for the proposed wind turbine within the landownership at Drummick. The proposed turbine is located within fields currently used for grazing and is not subject to any statutory or non-statutory environmental designations.
- 6.22 The proposed wind turbine is in support of national, regional, and local planning policy with regards to renewable energy, the need to protect landscape character, visual amenity, nature conservation and biodiversity. In particular, the proposals are in accordance with the objectives of National Planning policy. The development would also be in keeping with policies within regional and local plans.

- 6.23 The proposed wind turbine would not be obviously visible from key environmental designations, including the Loch Lomond and the Trossachs National Park, River Tay (Dunkeld) and River Earn (Comrie to St Fillans), or the Fowlis Wester Conservation Area (CAs).
- 6.24 The siting, scale and form of the wind turbine would introduce a further built element into the receiving landscape, although these would be generally viewed in the context of other infrastructure and transport corridors, including the pylons and transmission lines on the site itself, Perth, and the A85.
- 6.25 There would be no significant change to the physical characteristics of the surrounding area as identified within the landscape character assessments. Specifically, tree cover, field pattern, and drainage patterns would be materially unaltered by the development. As such the proposals would be in accordance with the findings of the 'Landscape Study Windfarm development in the Ochil Hills and Southern Highland Perthshire' that confirms the Lowland Hills landscape is capable of accommodating "sensitive wind windfarms".
- 6.26 It is evident from the Zone of Theoretical Visibility (ZTV) and field survey that actual visual envelope for the proposed wind turbine would be limited with visual effects restricted beyond 2km from the wind turbine. This would be due to the topography of area, tree cover, and distance.
- 6.27 At close proximity within 2km of the wind turbine, views of the rotor blades and tower would be evident near Sluidubh and Drummick to the south east and north west respectively.
- 6.28 Within more distant photoviews beyond 2km from the wind turbine, the tower and rotor blades generally form a small component of the view that would be assimilated into the wider landscape setting. The wind turbine would be scarcely perceptible from distant elevated locations to the south east including Dunning and Tullibardine Collegiate Church. The outlying terrain of Mounth Highlands also provides an elevated backdrop behind the wind turbine, the result is that moving rotor blades would not be apparent on the skyline.
- 6.29 Although there would be visual change at close proximity it would not necessarily be a harmful one, merely slightly different to one that exists at present. It is also recognised that the proposed wind turbine would generally be viewed in the context

of nearby pylons and transmission lines that already provides a strong vertical and horizontal built elements in the landscape. It is also acknowledged that any scheme involving renewable energy and wind turbines will form visible elements in the view.

- 6.30 The cumulative effect on both landscape and visual amenity arising from the proposed wind turbine and other wind farm developments would be minor.
- 6.31 The accompanying landscape report demonstrates that the proposed wind turbine could be successfully accommodated and assimilated into the wider landscape without causing significant harm to landscape character, visual amenity or the landscape features of the area. The proposed wind turbine would be acceptable in landscape and visual terms.

Terrestrial Ecology, Ornithology and Nature Conservation

- 6.32 The location of the application site has been chosen to best mitigate against any potential ecological issues. No habitat or ecological feature listed within the European Habitats Directive nor any flora of conservation interest is located within the area affected by the proposed development.
- 6.33 An extended Phase 1 habitat survey and desk-based study was undertaken of the site and in order to identify any nearby sites designated for nature conservation interest and potential features of ecological interest in the wider area.
- 6.34 The results of the field survey and desk study demonstrate that the wider survey area supports some features of ecological value, although the turbine area is proposed within a mixture of habitats including improved grassland, poor semi-improved grassland, semi-improved acid grassland, inundation vegetation and ditches of relatively low ecological value.
- 6.35 The application site is not contained within a statutory designated site. The River Tay Special Area of Conservation is located 1.5km to the north of the site; South Tayside Special Protection Area/RAMSAR site and Dupplin Lakes Site of Special Scientific Interest area located 9.7km to the south east of the site.
- 6.36 Detailed wintering and breeding bird surveys, including Vantage Point surveys have been carried out in order to consider the potential for impacts on protected and notable bird species in the area. The findings are discussed in detail within the accompanying Compendium of Environmental Reports. In summary, it is

demonstrated that the effects of the proposed development on ecological assets are acceptable.

Archaeology and Cultural Heritage

- 6.37 The application has considered the archaeological and cultural heritage assets of the site and surroundings. The detailed assessment contained within the accompanying Compendium of Environmental Reports has considered the below-ground archaeological remains, standing buildings and the historic landscape.
- 6.38 There are no recorded cultural heritage assets within the site. Heritage assets recorded in the vicinity of the site comprise the 19th Century farmstead at Drummick to the north-east, the site of a 19th Century farmstead at Gorthy Wood to the west, and the rubble remains of a possible shieling to the south. It is considered that the proposed development will have no known physical effect upon the cultural heritage resource.
- 6.39 There are also anticipated to be no non-physical (visual) effects upon the setting of Keillour Garden and Keillour Castle. Rising topography and intervening forestry plantation completely screen the proposed development site from these assets. Furthermore, the topographical setting of Keillour Castle and Garden, and vegetation within the gardens themselves, create a secluded setting which is largely screened from the surrounding landscape. The non-physical (visual) effects upon the significance of further designated heritage assets in the vicinity of the site is considered to be negligible. Intervening topography and vegetation largely screen the proposed development from nearby heritage assets.

Noise

- 6.40 An assessment of the likely noise effect of the proposed Drummick wind turbine has been carried out. Worst case downwind turbine noise levels at the closest residential locations to the site have been predicted based on warranted sound power level data for an Enercon E53 wind turbine. Predictions were carried out according to recommendations in the Institute of Acoustics (IoA) Acoustics Bulletin Vol 34 no. 2 article *Prediction and Assessment of Wind Turbine Noise*.

- 6.41 The assessment has been carried out by comparing predicted noise levels with noise limits described in ETSU-R-97, *Assessment and Rating of Noise from Wind Farms*, as referred to in PAN 1/2011, *Planning and Noise*.
- 6.42 The assessment shows that the predicted wind turbine noise levels at all non-financially involved residential properties meets the ETSU-R-97 simplified noise limit under all conditions by a margin of 2.2 dB, which is greater than the 1dB safety factor recommended by Enercon.

Aviation

- 6.43 It is considered that the findings of the analysis and the comments of statutory consultees demonstrate that there would be no significant effects on aviation interests as a result of a wind turbine operating at Drummick at the designated coordinate, with or without further micro-siting provisions.

Telecommunications

- 6.44 It is considered that the findings of the analysis and the comments of statutory consultees demonstrate that, following implementation of any necessary mitigation, there would be no significant effects on telecommunications as a result of a wind turbine operating at Drummick at the designated co-ordinate with or without further micro-siting provision.

Transport and Access

- 6.45 The potential impact of HGV traffic associated with the proposed turbine construction has been assessed in relation to existing traffic flows. The project would add no more than 40% to the average HGV flows on the A822 on the days when the movements are at their peak. This effect is considered insignificant in both the scale and the duration. In conclusion, this is a figure of less than 2% of the average total traffic flows on the A822.
- 6.46 It is recognised that the delivery of the turbine components will require careful thought and planning. Additionally given the nature of the size of these components it is likely that there will be a requirement for a police escort. Each delivery vehicle would follow a pre-determined route and the times can be arranged so that minimal disruption is caused to other road users.

7. SUMMARY AND CONCLUSIONS

- 7.1 The application proposes the erection of a single wind turbine of a height of 77m at land at Drummick, Glenalmond.
- 7.2 The relevant policies of the Development Plan and additional material statements/documents have been considered and the proposed development is considered to be found acceptable within this context. The principle of development is considered to be acceptable within this countryside location due to the overriding need for renewable energy and the effective siting and scale of the proposals situated at reasonable distance from those statutorily designated areas of landscape and ecological importance which are afforded the greatest levels of protection.
- 7.3 It is considered that the proposed wind turbine at Drummick would make a valuable contribution to the Government's sustainability objectives and contribution towards legally binding renewable energy and CO₂ reduction targets.
- 7.4 The anticipated effects of the development proposals have been assessed in detail within the accompanying Environmental Reports and summarised again within this report. It is considered that the supporting documentation provides a fair and robust assessment of the potential effects of the proposed development and it is considered that providing that the mitigation measures where necessary as recommended within this application are employed, the proposals are considered to be entirely acceptable at this location.
- 7.5 On the basis of the evidence provided within this report and supporting documentation, it is respectfully requested that the application for the proposed wind turbine at Drummick be granted planning permission.

DESIGN AND ACCESS STATEMENT

PROPOSED WIND TURBINE

LAND AT DRUMMICK GLENALMOND

Pegasus Planning Group Ltd
Pegasus House
Querns Business Centre
Whitworth Road
Cirencester
Glos
GL7 1RT

Telephone: (01285) 641717 Facsimile: (01285) 642348

PPG Ref: PA/CIR.C.0362

Date: 22nd February 2012

COPYRIGHT

The contents of this document must not be copied or reproduced in whole or in part without the written consent of **Pegasus Planning Group Ltd**

CONTENTS:

	Page No:
1. INTRODUCTION	1
2. SITE DESCRIPTION & CONTEXT	2
3. DESIGN	3
4. ACCESS	8

1. INTRODUCTION

1.1 This Design and Access Statement forms part of a package of documents accompanying the application.

1.2 The purpose of this document is to demonstrate that the Applicant has fully considered the design and access issues as part of the comprehensive preparation of the scheme prior to submission of the planning application. This report therefore covers the following matters:

- Use
- Amount
- Layout
- Scale
- Landscaping
- Appearance
- Access

2. SITE DESCRIPTION & CONTEXT

- 2.1 A Site Location Plan is submitted with this application for reference.
- 2.2 The Proposed turbine development area comprises an area of land of approximately 0.8ha and is located in a rural area between Glenalmond approximately 1km to the north and Keilour approximately 2.5km south/south-east. Buchanty Burn lies a little further west from the site area.
- 2.3 The site is presently in agricultural use and does not hold any particular conservation or biodiversity value. A search of “sensitive areas” as defined by the EIA Regulations confirms that the site is not located within any such “sensitive area”. The site is bordered to the south by woodland and agricultural land to the immediate north, east and west.
- 2.4 There are no Sites of Special Scientific Interest (SSSI) within or adjacent to the site; the closet being Methven Moss over 5km south east, a second SSSI (Connachan Marsh) is 8km south west. There are no National Parks within or close to the site – the nearest being Loch Lomond and The Trossachs National Park over 66km to the west. The site is not within or close to any World Heritage Sites or Scheduled Monuments (SMs). The closest SMs are Fendoch Burn Roman Fort, Sair Law burial mound and Inchaffray Abbey approximately 4km away. The Site is not within a National Scenic Area, the closest being River Tay (Dunkeld) approximately 15km north of the site. There are no Ramsar Sites, Special Protection Areas (SPAs) or Special Areas of Conservation (SAC) (European designations under the Habitats Regulations) within or adjacent to the site. The closest SAC is Methven Moss 5km away. The closest Ramsar Site and SPA is South Tayside Goose Roosts approximately 10km south east.
- 2.5 An unclassified road passes east of the site area in a north – south direction, leading to Drummick.
- 2.6 Existing land use within the site comprises grazing land which is surrounded by pasture land and forestry within the wider area. Overhead cables transect the North-East of the site connecting the turbine to the Grid.

3. DESIGN

- 3.1 A considerable number of factors have contributed towards the design and layout of the site that is now put forward. These are now discussed against the various aspects of Design highlighted within CABA's guidance document regarding the production of Design & Access Statements.

Use

- 3.2 The site currently lies within open farmland within the wider countryside setting. The proposed wind turbine will not result in the loss of any significant part of the site as the space taken up by the turbine will be minimal, comprising only the dimensions of the foundations that support the turbine. Agricultural practices can still take place right up to the foundation base of the turbine.
- 3.3 The proposal is for the erection of a single wind turbine with a maximum blade height of 77m. It is anticipated that the turbine would be operational for a duration of 25 years. It is also proposed to erect a 50m anemometer mast for a temporary period of 18 months in order to record local wind speeds.
- 3.4 The proposed location has been chosen due to its exposure to commercially viable wind speeds and limited environmental constraints. The location also provides an uninterrupted airflow by virtue of the site being some distance from structures which would detrimentally influence the generating capacity of the turbine.
- 3.5 If the Council is to continue its excellent records of contributing towards meeting the Renewable Energy targets then such developments will continue to be required within the countryside where the capacity to support such schemes is greater than within an urban setting.

Amount and Fabrication

- 3.6 It is proposed to construct a single wind turbine with a height to blade tip of 77m. The wind turbine will be formed of 3 blades made from reinforced carbon fibre. The turbine will be mounted on 50m mast (hub height) made of galvanised steel.
- 3.7 The exterior finish of the turbine is proposed to be matt white/silver. The final finish can be the subject of an appropriate Condition of an approval if required by the Local Planning Authority.

- 3.8 The overall scale of the turbine will create a maximum height of 77m. The rotor diameter will be 27mm.
- 3.9 Whilst the site comprises an area of 0.8ha, the land take for the wind turbine will be small (0.014ha). This is formed by the concrete foundations and infrastructure requirements. At the end of the turbine's lifespan of 25 years, the plant and machinery can be dismantled and removed and the site restored to its former use.
- 3.10 The proposed anemometer mast is formed from two main components; a mast and meteorological measuring equipment (the anemometer).
- 3.11 The mast itself is fabricated from seventeen sections each approximately 3m in length. The mast will be 152mm diameter from base to tip.
- 3.12 The mast is held erect with six sets of Kevlar guy wires, each with 4 wires. The guy wires will be anchored to the field at radii of 30.4m and 33.52m from the base of the mast.
- 3.13 The overall total land area occupied by the mast and supporting guy wires is approximately 0.4ha. However, the actual land take will be a small percentage of this area by virtue of the mast's slender construction.
- 3.14 As part of the fabrication specification of the mast, it will be anodised 'natural' metal grey in colour. However, the applicant is willing to change these colour specifications should the LPA consider this necessary. This would be most appropriately dealt with by way of planning Conditions attached to a future permission.
- 3.15 The design and limited scale of the mast means that no further anchoring or support is required at the base of the tower.
- 3.16 The mast has been specifically designed and fabricated for the purpose of recording wind speed, direction and pressure at multiple heights. The lower anemometer will be attached to the mast by a detachable collar.
- 3.17 The recording and onward broadcast equipment will be located in a secure anchored box at the base of the mast. This will require no external power feed for operation.
- 3.18 All plant and equipment will be completely removed from the site at the end of the recording period (after 18 months operation).

- 3.19 No concrete or other permanent foundations are required for this element of the proposed development.

Layout

- 3.20 In proposing the general layout of development, great consideration has been given to the relationship of the existing buildings and surrounding trees and hedgerows. This will help ensure that the development sits comfortably within, and is well contained by, its natural surroundings whilst not adversely detracting from the ability of the existing farm estate to operate or detrimentally effect surrounding environmental characteristics.

- 3.21 The specification for the location, positioning and height of the turbine and associated anemometer mast is based on the following considerations relating to achieving a maximum economic output of the turbine, while minimising any detriment to the landscape and wider visual amenity, whilst also adhering to the safe working practices as recommended by the manufacturer.

- There are no overhead electricity transmission lines, trees or other height obstructions in the vicinity which would necessitate the relocation of the turbine.
- The site is not located within any environmentally sensitive areas so as to reduce any potential impacts the proposed development may have on landscape and visual amenity and ecological assets.
- No public access is required as part of this development.

Scale

- 3.22 The scale of development on site has been determined by the requirements to achieve a consistent and smooth laminar airflow in order to maximise the renewable energy generating potential of the turbine. Achieving a 'clean' airflow maximises output, minimises fatigue and associated maintenance costs caused by turbulent airflow.
- 3.23 The requirement to maximise the economic potential of the proposals has been weighed against the environmental sensitivity of the site and the wider surroundings to inform a suitable scale of proposed development.

- 3.24 The anemometer mast height is dictated by the requirements of being able to measure meteorological conditions at the theoretical hub height of any future wind turbine along with secondary 'background' data to inform a detailed energy production and noise assessment.
- 3.25 Initial desk based investigations and calculations show the optimum hub height for a wind turbine in this location is likely to be 50m. Therefore a monitoring mast of similar height is appropriate for the recording of all necessary data (with additional data capture at 25m to provide a secondary data source).
- 3.26 In order to minimise the risk of birds striking the guy wires, it is envisaged that should it be the wish of the Council, these wires may be fitted with bird deflectors if appropriate. It is considered that this matter could be appropriately addressed through a Planning Condition attached to any future grant of consent.

Landscape

- 3.27 The proposal has been subject to a detailed landscape and visual impact assessment which forms a separate report. The following design principles have been considered as part of the development of the scheme:
- Development and application of the most suitable wind turbine design for the site, to respond to the local landscape character and provide an acceptable design solution in terms of scale, layout and visual composition.
 - Achieve a cost effective scheme that may be viewed and considered an acceptable component of the landscape.
 - Minimise the adverse landscape and visual effect on views from key receptors such as important protected landscape, highways and public footpaths and settlements.
- 3.28 No formal landscaping scheme is proposed as part of this wind turbine development.

Appearance

- 3.29 A detailed consideration of the appearance of the turbine in relation to the landscape and its visual impact is included within the Landscape and Visual Impact Assessment which accompanies this application.

- 3.30 In summary, the accompanying landscape report demonstrates that the proposed wind turbine can be successfully accommodated on site and assimilated into the surrounding area without causing significant harm to the local character, or landscape features of the area. There may be some significant effects upon residential visual amenity for some nearby properties. However, the proposed development comprises a single wind turbine and its effect upon the landscape character is judged to be slight / moderate.
- 3.31 The anemometer monopole mast will be a temporary structure and have minimal visual impact by virtue of its fabrication and materials providing a non-intrusive object when placed in its proposed setting.
- 3.32 Indeed, the monopole design of the met mast is considered to be the most visually unobtrusive design within the industry.
- 3.33 Appeal precedents have established that even 70m high meteorological masts would have little adverse impact on the surrounding landscape by nature of their slender construction (for example APP/X1545/A/06/2017191/NWF, APPX4725/A/07/2051921 and APP/P4415/A/06/2005568).

4. ACCESS

- 4.1 The site is proposed to be accessed to the north of the site via the A822 and the B8063 and an existing unclassified lane east of the site.
- 4.2 Construction of the wind turbine will require items of plant and machinery equipment coming to the site as well as aggregate and concrete for the construction of the foundations (although the foundations will be minimal). The construction period for the above components is anticipated to take approximately 2 months.
- 4.3 The wind turbine components will be transported to site via standard 40 foot or 60 foot articulated lorries.
- 4.4 The main transport impacts will result from the movement of the commercial HGV's and light vehicles to and from the proposed development site during the construction phase of the development. All construction vehicles will utilise the local highways.
- 4.5 During the operational phase very few vehicle movements are expected to be generated by the development, only relating to maintenance activities.
- 4.6 The development will not be open to the general public and will be maintained by a dedicated team of engineers. For this reason, it is not appropriate to apply the requirements of inclusive access to this proposed scheme.

PUBLIC CONSULTATION STATEMENT

DRUMMICK WIND TURBINE, GLENALMOND, PERTH

Pegasus Environmental
Pegasus House
Querns Business Centre
Whitworth Road
Cirencester
GL7 1RT

Telephone: (01285) 641717 Facsimile: (01285) 642348

PPG Ref: CIR.C.0362
Date: January 2012

COPYRIGHT

The contents of this document must not be copied or reproduced in whole or in part without the written consent of **Pegasus Planning Group Ltd**
(Pegasus Environmental is part of Pegasus Planning Group Ltd)

CONTENTS:

Page No:

1.	PURPOSE OF THIS STATEMENT	2
2.	THE PLANNING APPLICATION	2
3.	THE APPLICANT	3
4.	PROMOTING THE OPPORTUNITY TO PARTICIPATE IN THE CONSULTATION	3
5.	FEEDBACK & COMMENTARY	4
6.	SUMMARY & CONCLUSIONS	13

APPENDICES

APPENDIX 1	Proposed location of development
APPENDIX 2	Project Leaflet and Comments Forms

1. PURPOSE OF THIS STATEMENT

- 1.1 This document is the consultation statement in support of an application for planning permission for a renewable energy development comprising of a single wind turbine at Drummick site, Glenalmond, Perth.
- 1.2 The site comprises privately-owned land and the turbine co-ordinate is located at Grid Reference 295306, 726818.
- 1.3 The proposed turbine development area is located in a rural area between Glenalmond approximately 1km to the north and Keillour approximately 2.5km south / south-east.
- 1.4 The planning application is submitted by ClearWinds Ltd. The consultation statement provides detailed information regarding the pre-application consultation which has been undertaken prior to the submission of the planning application seeking permission for the development.

2. THE PLANNING APPLICATION

- 2.1 The planning application is being submitted to Perth and Kinross Council as the Local Planning Authority (LPA) for the development site.
- 2.2 The Planning Application seeks permission for:

"Proposed erection of a single 77m wind turbine with a maximum rated capacity of 900kW for a period of 25 years and erection of an anemometry mast up to 50m height for a period of 18 months".
- 2.3 To enable the LPA, statutory consultees, other interested parties and local residents to make informed comments and decisions about the proposed Drummick Wind Energy Proposal, the planning application is submitted with the following documents:
 - Application Form
 - Schedule of Drawings
 - Planning Supporting Statement
 - Design and Access Statement
 - Compendium of Environmental Reports
- 2.4 The proposed location of the development is shown in Appendix 1

3. THE APPLICANT

- 3.1 ClearWinds Ltd. (ClearWinds) is an independent wind energy development company that engages leading industry expertise to deliver green sustainable energy whilst supporting local community initiatives through the provision of community benefits
- 3.2 ClearWinds is involved with projects from their inception and throughout their lifespan, seeking to build strong relationships with landowners and local communities.
- 3.3 Onshore wind is recognised as a significant opportunity for communities and the rural sector more generally to generate much needed local revenue to assist in sustaining local economies and community infrastructure.
- 3.4 ClearWinds are offering to make annual community and residential benefit payments. The scale of such payments, linked to gross operating revenues, will be outlined in a Section 75 proposal under the Town and Country Planning Act (Scotland) 1997 (as amended). It is estimated that these funds would contribute around £10,000 per annum for the lifetime of the project, for each of the community and residents funds.
- 3.5 ClearWinds undertakes a rigorous site selection process which is designed to create the right scheme in the right location – generating significant much-needed renewable electricity while respecting the local environment that hosts the projects.
- 3.6 ClearWinds is committed to public consultation and always aims to obtain local residents feedback before submitting its proposals.

4. PROMOTING THE OPPORTUNITY TO PARTICIPATE IN THE CONSULTATION

- 4.1 A leaflet was prepared describing the scheme proposal and information on work commissioned and work in progress (see copy of leaflet within Appendix 2). A questionnaire section was included within the leaflet which had a mix of scheme specific questions and more general ones about renewable energy and space for any other comments and suggestions about the scheme. The leaflet was hand delivered to local residents within a radius of 3km of the proposal during early November 2011.
- 4.2 During the leaflet drop face-to-face discussions between local residents and ClearWinds took place at the closest properties located to the proposed turbine.

4.3 In addition to public community participation ClearWinds consulted with various stakeholders during the development stage of the project. Statutory Consultees included:

- MOD
- CAA
- NATS
- Ofcom
- Joint Radio Company
- Atkins
- Scottish Natural Heritage (SNH)
- The Royal Society for the Protection of Birds (RSPB)
- Perth and Kinross Council Landscape Officer
- Historic Scotland

5. FEEDBACK & COMMENTARY

5.1 A total of 70 leaflets were posted within the local area. 15 completed leaflets were received back.

5.2 The content of each response has been recorded verbatim below. The name of the respondent has been abbreviated and their address limited to a street or area only in order to conform with the current legislation. Letter responses have been described below accordingly.

5.3 Feedback Commentary is given in the table below:

No.	Address	Questions/Comments	Support Scheme at Drummick?
1	HM Glenalmond	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Yes</p> <p>Are you concerned about global warming and green issues?</p> <p>Yes</p> <p>Do you support wind development within the UK?</p>	Yes - support

		<p>Yes</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>Yes... with conditions</p> <p>Any Other Comments</p> <p>To fully support the project I would be seeking some kind of financial recompense. I am the closest resident and am concerned about low frequency noise.....[rest of text not provided to author]</p>	
2	TD Keillour	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Yes</p> <p>Are you concerned about global warming and green issues?</p> <p>Yes to some extent, but the Almighty will fold the earth up when he sees fit.</p> <p>Do you support wind development within the UK?</p> <p>Yes 100%</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>Yes it benefits all.</p> <p>Any Other Comments?</p> <p>These windmills are wonderful, the wind is wonderful, energy is wonderful. P.T.O.....</p> <p>Call in for coffee and hopefully one day you'll get me a stack of windmills too.</p>	Yes - support
3.	GED Methven	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Yes, Circled on map</p> <p>Are you concerned about global warming and green issues?</p> <p>No</p> <p>Do you support wind development within the UK?</p>	Yes - support

		<p>No</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>Providing only one windmill for benefit of the farmer</p> <p>Any Other Comments?</p> <p>Windmills are <u>not</u> a <u>farm</u> !</p>	
--	--	---	--

4	JL Methven	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Keillour</p> <p>Are you concerned about global warming and green issues?</p> <p>No</p> <p>Do you support wind development within the UK?</p> <p>Yes</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>Yes</p> <p>Any Other Comments?</p>	Yes -support
5	CMC Methven	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Resident of Keillour</p> <p>Are you concerned about global warming and green issues?</p> <p>Yes</p> <p>Do you support wind development within the UK?</p> <p>No. Spoiling our Scottish countryside.</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>No. Disruption to this country area (see marked paragraph overleaf)</p> <p>Any Other Comments?</p> <p>Nuclear power is the way to go. Leave our countryside alone.</p>	No
6	JML Keillour	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Resident of Keillour.</p> <p>Are you concerned about global warming and</p>	Yes - support

		<p>green issues?</p> <p>Yes</p> <p>Do you support wind development within the UK?</p> <p>Yes, if site appropriate.</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>Require further information before making decision i.e. construction traffic – road capabilities etc.</p> <p>Any Other Comments?</p> <p>Are there further proposals to extend this development?</p>	
7	AML Keillour	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Keillour</p> <p>Are you concerned about global warming and green issues?</p> <p>Yes</p> <p>Do you support wind development within the UK?</p> <p>Yes, very much</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>Yes, good for environment and good for local economy and community</p> <p>Any Other Comments?</p> <p>Fully support this wind turbine.</p>	Yes - support
8	JH Methven	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Yes</p> <p>Are you concerned about global warming and green issues?</p>	Yes - support

		<p>Yes</p> <p>Do you support wind development within the UK?</p> <p>Yes</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>Yes I am in favour of wind energy, it looks like a good location.</p> <p>Any Other Comments?</p> <p>I would like one also !!</p>	
9	AGM Queensferry	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Not currently a resident, but own farm and woods adjacent to proposed site.</p> <p>Are you concerned about global warming and green issues?</p> <p>Yes</p> <p>Do you support wind development within the UK?</p> <p>Yes</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>Probably not, it will affect our property. Our plans for a turbine is on hold at present but will be re-instated if this proposal is given approval.</p> <p>Any Other Comments?</p> <p>N/A</p>	No

10	JO Steading	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Yes</p> <p>Are you concerned about global warming and green issues?</p> <p>Yes</p> <p>Do you support wind development within the UK?</p> <p>Within certain boundaries.</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>No, I believe the sighting is inappropriate to an area where there is already a proliferation of wind farms.</p> <p>Any Other Comments?</p> <p>The sighting of one turbine is clearly just a beginning to further inappropriate additions.</p>	No
11	Anonymous	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Yes</p> <p>Are you concerned about global warming and green issues?</p> <p>Yes</p> <p>Do you support wind development within the UK?</p> <p>Not entirely</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>No - wrong place, insufficient wind in the Glen for commercial or domestic use.</p> <p>Any Other Comments?</p> <p>Wind power is <u>very</u> inefficient and spoils the countryside.</p>	No

12	Anonymous	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Yes</p> <p>Are you concerned about global warming and green issues?</p> <p>Yes</p> <p>Do you support wind development within the UK?</p> <p>Not particularly</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>Not really – my view is that wave power is the way to go</p> <p>Any Other Comments?</p> <p>It seems a great deal of trouble for one turbine with a wind farm in prospect in the area at end of the Glen, why not join it?</p>	No
13	Anonymous	<p>Are you a resident of Glenalmond or Keillour? If not, please state the area in which you live.</p> <p>Yes</p> <p>Are you concerned about global warming and green issues?</p> <p>Yes</p> <p>Do you support wind development within the UK?</p> <p>No – it is an insufficient approach to the problem.</p> <p>Do you support the proposed wind development at Drummick? Please state your reasons below.</p> <p>No this is not a suitable place for a wind farm.</p> <p>Any Other Comments?</p> <p>N/A</p>	No
14	TW Glenalmond	<p>Individual Letter dated 15th December 2011</p> <p>RE WIND TURBINE AT DRUMMICK, GLENALMOND, PERTH</p> <p>Dear Mr Clare</p>	Undecided

		<p>Further to your visit last month in respect of the proposed erection of a proposed wind turbine at the above location I am now writing in advance of any planning application to raise some key issues which I hope you can respond to:</p> <p>LOCATION The proposed location is of major concern to us. Our vista and that of our neighbour is out onto the Sma Glen. There is currently a wood between us and the proposed turbine but we do not own this wood and should it come down then we would have direct site of the turbine. Your map does not properly indicate where this turbine is to be sited. Is it in the dip at the back of the wood? Will we be able to see the tips of the turbine with the wood there?</p> <p>NOISE There are four properties including ours in relative proximity to the proposed site and despite the fact there is only one proposed turbine nevertheless raises major concerns about noise pollution. There have been several well publicised cases recently of noise from turbines contributing to depressive conditions including insomnia and I and others need to be assured that this will not be the case with this single turbine.</p> <p>CONSTRUCTION The access road to the proposed site is a very narrow country lane which is used by cars going to Glenalmond College as well as local residents. It is not at all suitable for construction traffic of the kind that will be required for the erection of this turbine. There are many blind bends on the road and it frequently gets icy. This is a significant issue.</p> <p>RATIONALE Why here in the middle of unspoilt grazing area where there is significant bird life? Most weekends there are bird watchers from the road and we will seek advice from Scottish Natural Heritage on the Importance of this area for bird life. In addition although the application is only for one wind turbine, it follows another application for a bigger development - The Mull Hill Wind Farm- just up the road of the Sma Glen. There does also exist the huge Griffin Wind Farm near Aberfeldy as well as others which have been rejected. I look forward to hearing your comments on the above.</p>	
--	--	--	--

Analysis of the responses

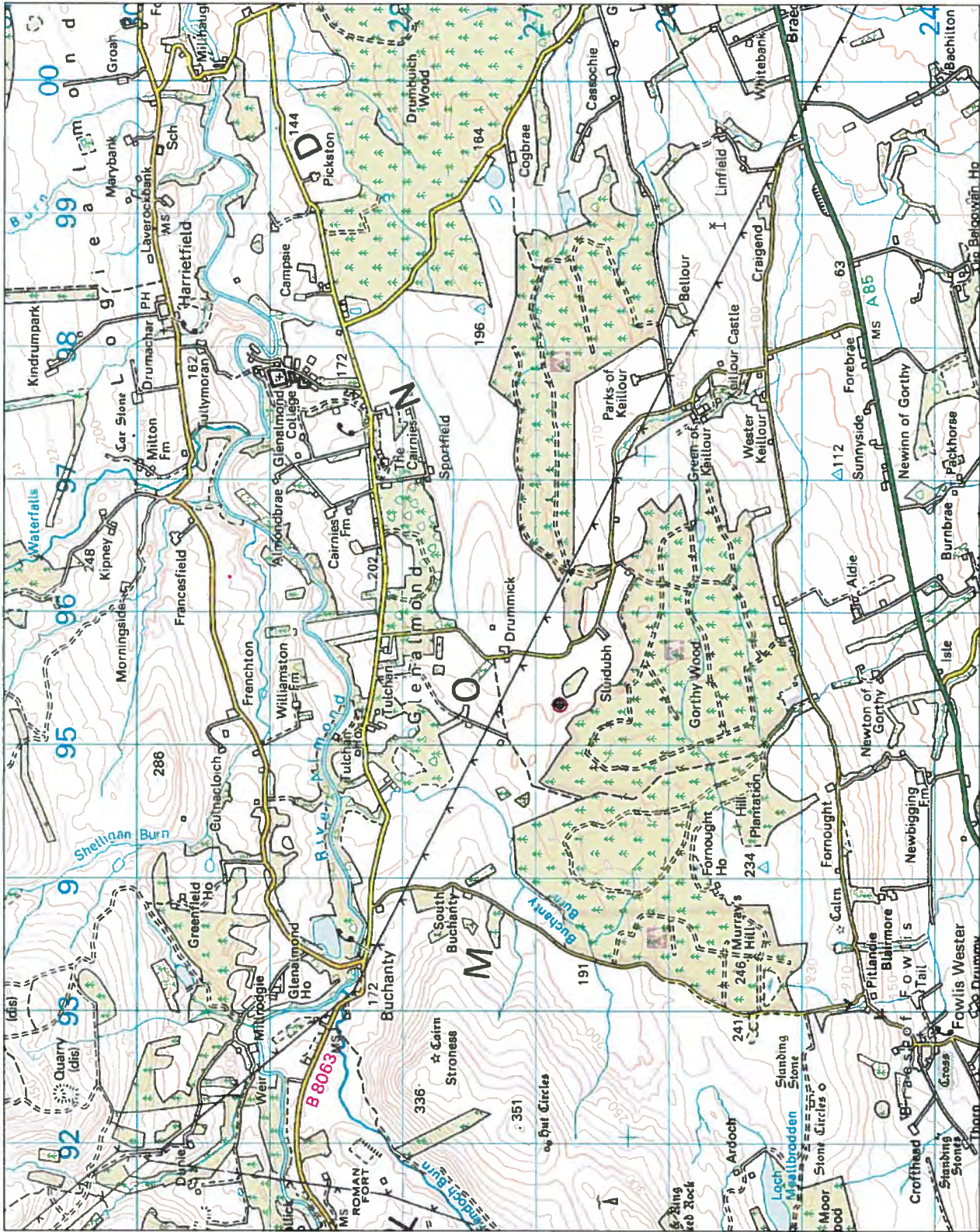
- 5.4 A total of 70 leaflets and feedback forms were hand delivered to residents within a 3km area of the proposed site. Out of the 70 homes which received a leaflet and feedback form only 14 residents completed and returned the form. Of the 14 completed questionnaires shown in the table above 7 people are in favour of the proposals at Drummick, 6 people are against and one undecided. On balance this shows there is an overall majority of residents who responded to the consultation are in favour of the proposed single turbine at Drummick.




6. SUMMARY & CONCLUSIONS

- 6.1 This document summarises the consultation process taken place in support of an application submitted by ClearWinds Ltd. for planning permission for a renewable energy development. The proposals comprise a single wind turbine at Drummick, Glenalmond, Perth. The proposed turbine development area is located in a rural area between Glenalmond and Keillour. The site comprises privately-owned land and the turbine co-ordinate is located at Grid Reference 295306, 726818.
- 6.2 The consultation consisted of a leaflet drop and face to face discussions to local residents within a 3km area of the proposed turbine location. The leaflet described the scheme proposal, information on work commissioned and work in progress. A questionnaire section was included within the leaflet which included a mix of scheme specific questions and more general ones about renewable energy and space for any other comments and suggestions relating to the scheme.
- 6.3 In addition to public community participation, ClearWinds consulted with various stakeholders during the development stage of the project.
- 6.4 Out of the 70 homes which received a leaflet and feedback form only 14 residents completed and returned the form. Of the 14 completed questionnaires 7 people are in favour of the proposals, 6 people are against and one undecided.
- 6.5 The consultation exercise has demonstrated out of residents who responded, there is on balance an overall majority of local residents who are in favour of the proposed single turbine at Drummick.

APPENDIX 1

Proposed Location of Development



Drumchick, Glenalmond	
Turbine Location Plan	
KEY  Site Boundary  Proposed Turbine 295366, 728818	
Client : ClearWinds Ltd	Checked by : AR
Drawn by : DP	Date : 14.06.2011
1 : 30,000 @ A3	C.0362_03-B
 Pegasus Environmental	

APPENDIX 2

Public Consultation Leaflet

How to Comment

It is very important to us that we hear what local people think before we finalise our plans and submit a planning application. We welcome your thoughts and feedback on our proposals.

We have provided a short questionnaire which we would appreciate if you could spare a few moments to fill in and post to:

ClearWinds Ltd.
Old Orchard
East Harting
Petersfield
Hants
GU31 5NE

Are you a resident of Glenalmond or Keilour? If not, please state the area in which you live.

Are you concerned about global warming and green issues?

Do you support wind development within the UK?

Do you support the proposed wind development at Drummick? Please state your reasons below.

Please use this space for any other comments or suggestions you may wish to make.

Your contact details

We understand that you may wish to make your comments on these proposals in complete confidence. However, it would help us to know your contact details, so that if necessary we can contact you again.

Thank you for your responses.

Name:

.....

Address:

.....
.....
.....
.....
.....
.....
.....
.....

Thank you for your responses

Useful information and frequently asked questions about wind energy is provided on the Renewable UK website:

www.bwea.com

For further information on ClearWinds Limited please see website details below:

www.clearwinds.co.uk



Prepared by Pegasus Environmental
and Town Planning Services

Proposed Wind Turbine Drummick, Glenalmond, Perth

CLEARWINDS

ClearWinds Limited (ClearWinds) is an independent wind energy development company that engages leading industry expertise to deliver green sustainable energy whilst supporting local community initiatives through the provision of community benefits.

ClearWinds are proposing to construct and operate a single wind turbine in the vicinity of Drummick, Glenalmond.

Wind turbines bring obvious benefits to the environment by helping to meet renewable energy targets and producing cleaner energy for us all. The scheme will help to contribute towards the UK target of 15% of energy from renewables by 2020. Wind is a clean and sustainable energy source and does not create pollution.

ClearWinds is undertaking public consultation in respect of the above development, prior to the preparation and submission of an application to Perth and Kinross Council for planning permission. The consultation process seeks the views of interested parties on the proposals to assist in the preparation of the planning application.

SITE AND PROPOSAL

The proposed turbine development area is located in a rural area between Glenalmond and Kellour. The existing land use within the site comprises of grazing land, the wider area surrounding the site consists of pasture and forestry.

The proposal is for the erection of a single wind turbine with a maximum rated capacity of 900kW for a duration of 25 years. The turbine will have a maximum hub height of 50m and a tip height of up to 77m.

Underground power cables, a temporary crane handstanding area and meteorological mast would also be required.

SITE SELECTION

ClearWinds have chosen the Drummick site after considering a range of technical, environmental and planning criteria. The most important technical consideration for the selection of a site for wind energy development is the available wind resource.

Other considerations were made in the selection of the site, including electrical connection, availability of land, site access, location of environmental designations, telecommunications, and aviation issues. The site is not located within any areas designated for their environmental sensitivity.

PROGRESSING THE PROJECT

Developing a wind farm is a complex process. There are many factors that restrict where turbines can be placed.

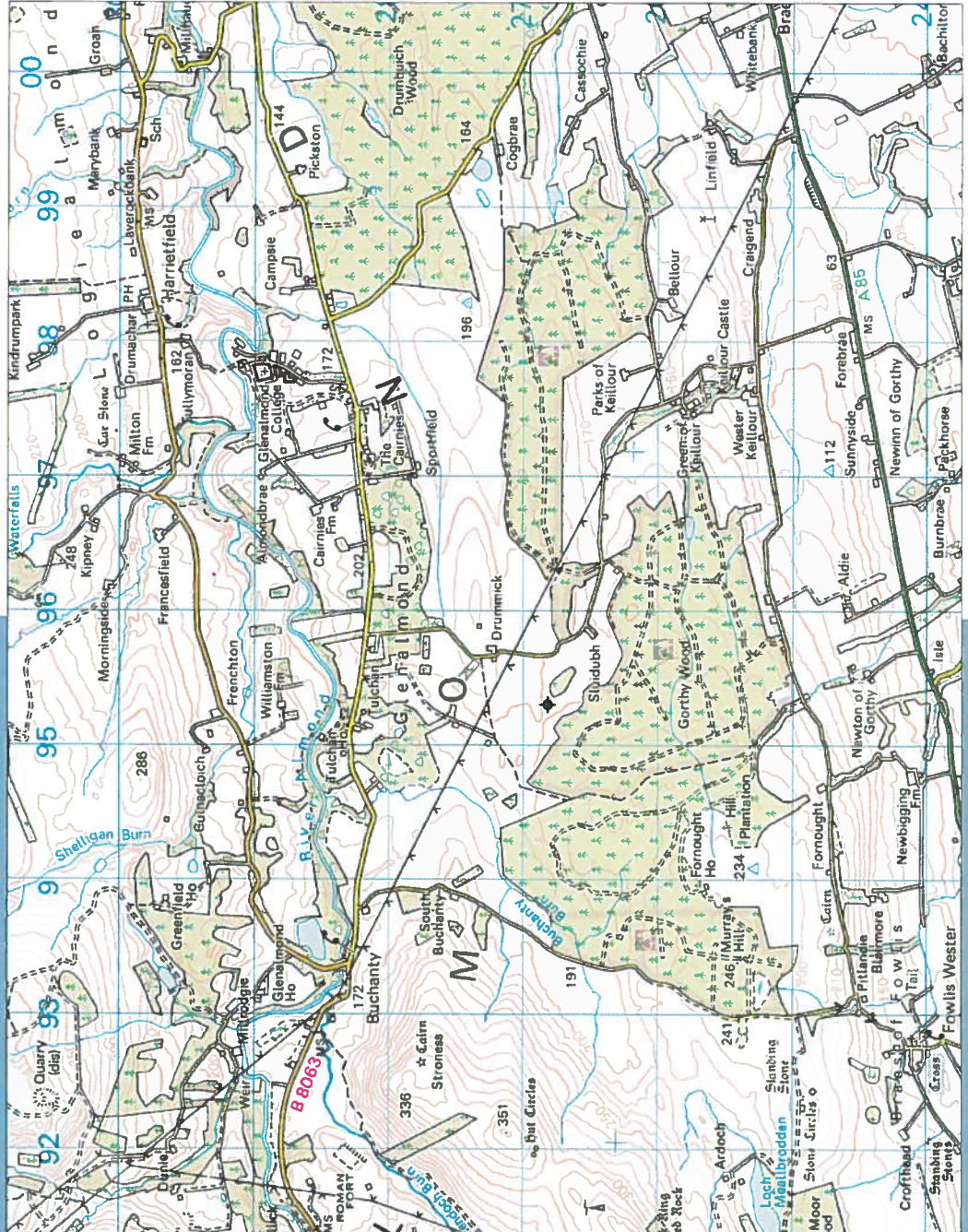
The Council has agreed that an Environmental Impact Assessment would not be required for the proposals but instead a series of separate reports and studies will be commissioned. We are in the process of assessing the following areas:

- Landscape and Visual Impact Assessment
- Ecological assessment (including breeding bird surveys, winter surveys for specific bird species and bat surveys)
- Archaeology and Cultural Heritage Statement
- Noise study
- Aviation and telecommunications studies
- Transport and Access Assessment
- Effects of construction

NEXT STAGES

Following this consultation process we will review all comments received from local residents, this feedback will help guide the project. A planning application will then be prepared and submitted to Perth and Kinross Council. The application will be accompanied by a Compendium of Environmental Reports which will identify any environmental issues and where necessary mitigation measures proposed. The application will also be accompanied with the relevant planning documents and drawings and will include a Planning Statement; and Design and Access Statement.

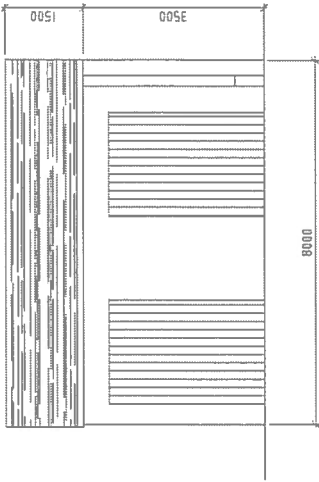
Once the application has been submitted the Council will carry out its own consultation process involving statutory consultees and stakeholders such as the Scottish Natural Heritage. Members of the public will have an opportunity to make their views known to the Council.



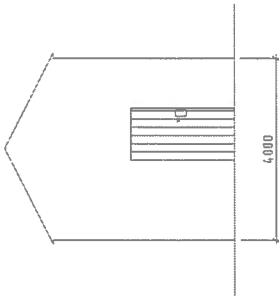
Drummick, Glenalmond - Turbine Location Plan

Legend:

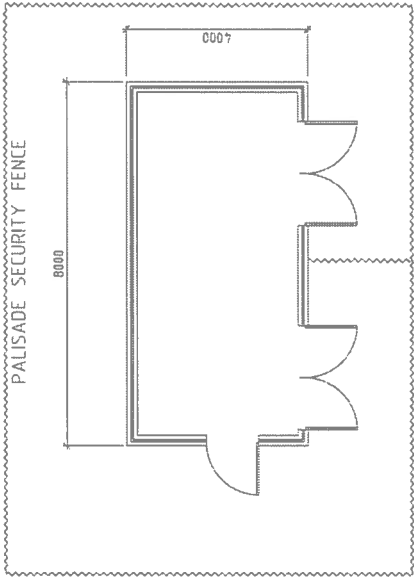
- 1. All dimensions in mm unless otherwise stated.
- 2. Foundation dimensions are to be confirmed depending on ground conditions and model of turbine.
- 3. Not for construction.



FRONT ELEVATION

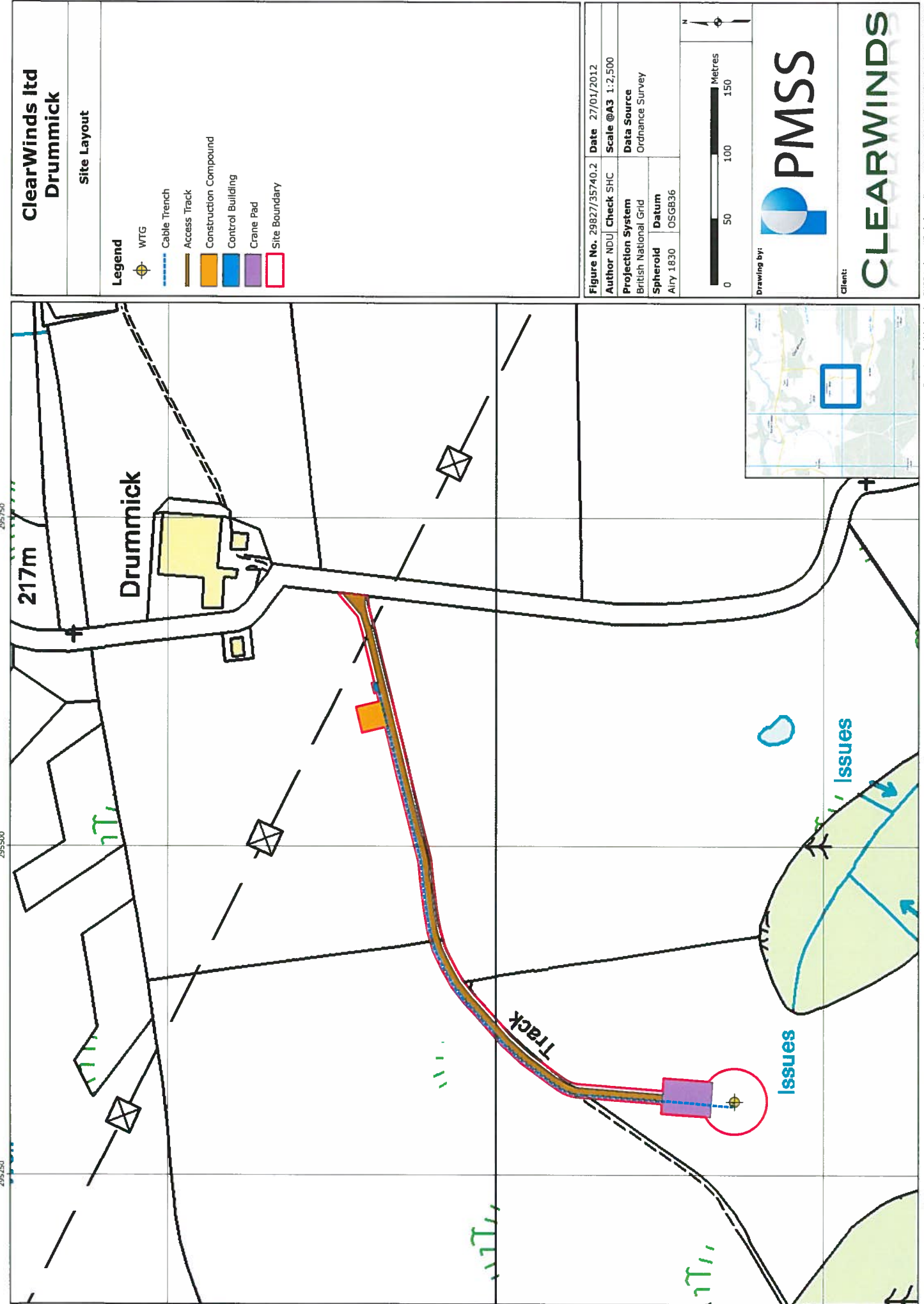


SIDE ELEVATION



Revision Description	Rev	By	Date
Project			
Drumnick - Wind Turbine Proposal			
Client			
ClearWinds Ltd			
Drawing Title			
TYPICAL_CONTROL_BUILDING			
Project No.	Drawing No.	Revision	
29827	-	00	
Drawn	Designed	Checked	
JSN	JSN	SHC	
Scale @ A2 size		Date	
1:100		02/02/12	
Do not scale this drawing PMSS to be notified of any discrepancies on this drawing Contractors must check all dimensions on site, prior to commencement of any work. This drawing is copyright.			





KEY

NOTE:
Height: 50m
Diameter: 152 millimeters
Guy radius: 30.40m and 33.52m
Winch radius: 12.2m

Drummick, Glenalmond

Met Mast Elevation Plan

CLEARWINDS

Drawn by : AD

Checked by : DB

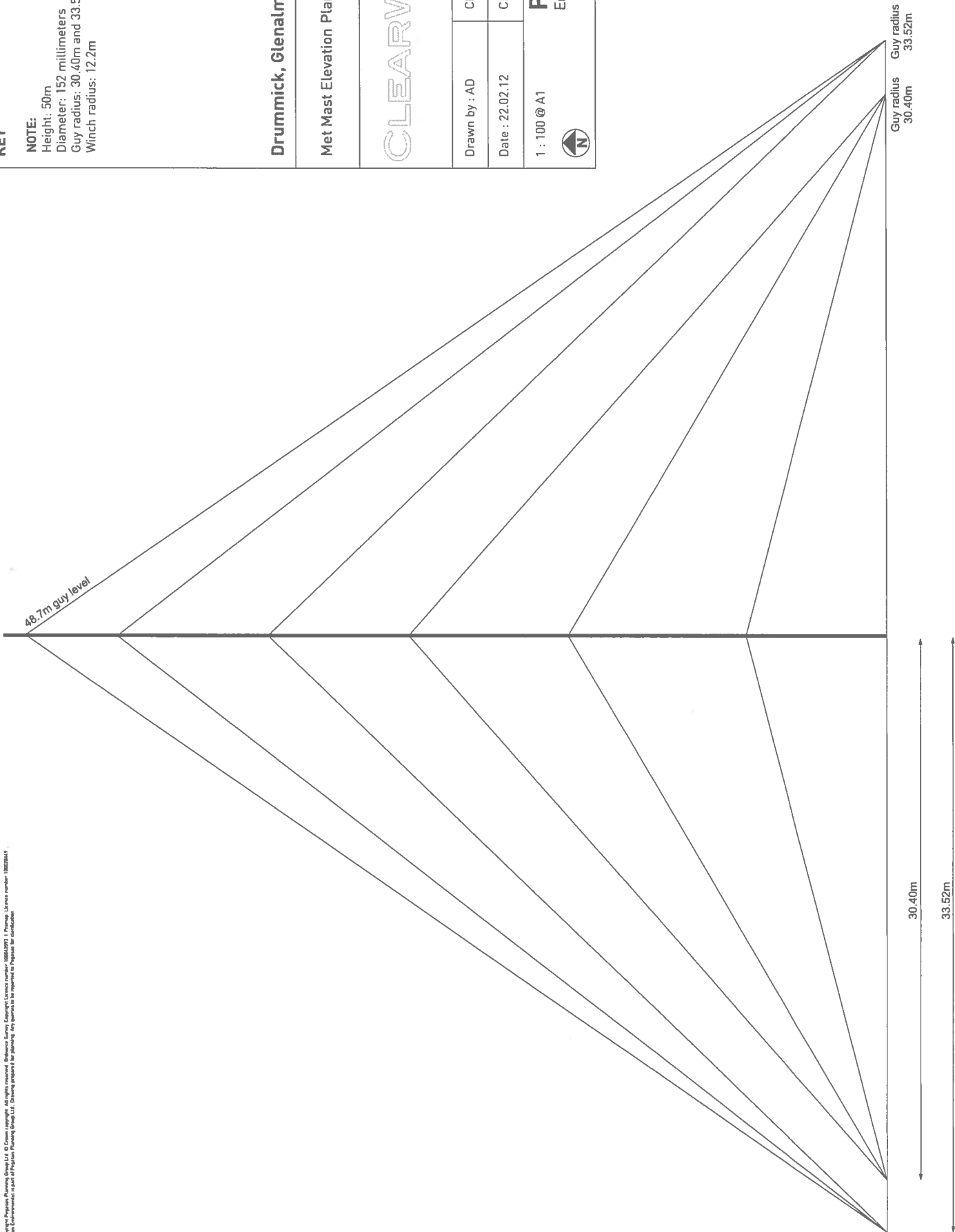
Date : 22.02.12

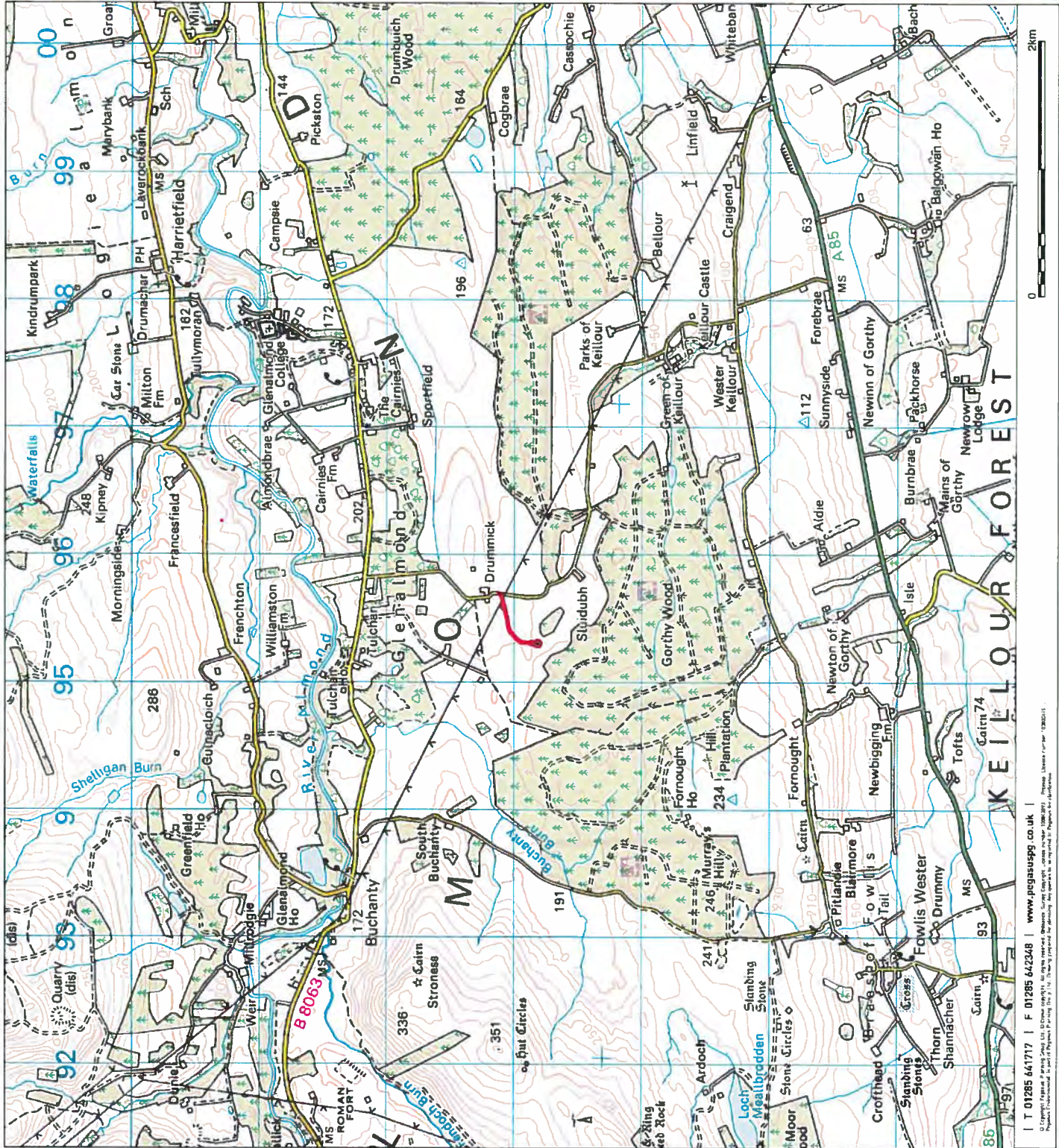
C.0362_22-A

1 : 100 @ A1

N

Pegasus Environmental





KEY
Application Site Boundary

Drummick, Glenalmond

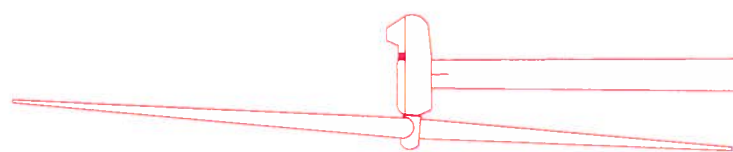
Site Context Plan

CLEARWINDS

Drawn by : AD	Checked by : DB
Date : 22.02.12	C.0362_03-B
1 : 30,000 @ A3	Pegasus Environmental



1. All dimensions in mm unless otherwise stated.
2. Foundation dimensions are to be confirmed depending on ground conditions and model of turbine.
3. Not for construction.



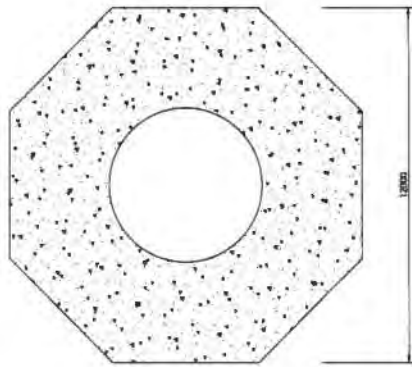
50000 Maximum Hub Height

External Transformer Housing

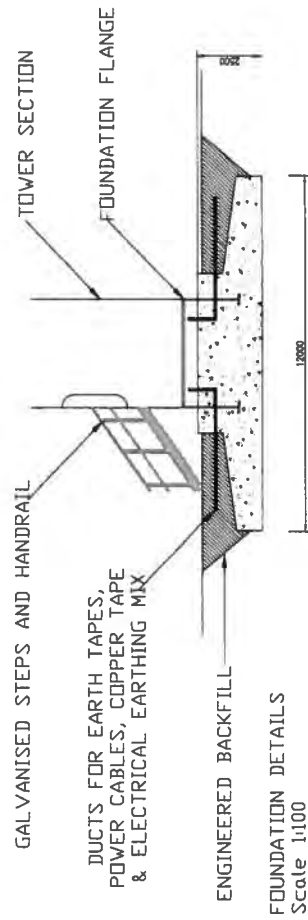
[illegible]

Legend:

1. All dimensions in mm unless otherwise stated.
2. Foundation dimensions are to be confirmed depending on ground conditions and model of turbine. No dimensions are to be measured from this drawing. Dimensions stated are indicative and to be confirmed following site investigation.
3. Not for construction.



PLAN VIEW WIND TURBINE BASE



SIDE VIEW WIND TURBINE BASE

Revision: 01
Project: DRUMHICK - WIND TURBINE PROPOSAL
Client: CLEARWINDS LTD

Drawing Title: TYPICAL FOUNDATION DETAIL

Project No.	Drawing No.	Revision
29827	0	0
Drawn	Designed	Checked
JSN	JSN	DB
Scale	Date	
1:100	01/02/12	

This drawing is copyright of PMSS. It is not to be used for any other purpose without the written consent of PMSS. It is not to be used for any other purpose without the written consent of PMSS.



CONTENTS

- 1. Introduction**
- 2. Construction Effects**
- 3. Ecological Assessment (Extended Phase 1 Habitat Survey, Bat Survey & Bird Survey)**
- 4. Landscape and Visual Impact Assessment**
- 5. Archaeology and Heritage Statement**
- 6. Transport and Access Statement**
- 7. Noise Assessment**
- 8. Aviation Report**
- 9. Telecommunications Report**
- 10. Summary & Conclusion**

FIGURES

1. Introduction

- Figure 1 Site Context Plan
- Figure 2 Site Location Plan
- Figure 3 Site Layout Plan

2. Construction Effects

Refer to Appendix B

3. Ecological Assessment

Extended Phase 1 Habitat Survey:

- Figure 1 Phase 1 Habitat Survey Map

Bat Activity Survey 2011 Report:

- Figure 1 Bat Survey Layout
- Figure 2 Bat Activity at Listening Points

Ornithology Surveys 2011:

- Figure 1 Survey Area
- Figure 2 All Target Wader and Wildfowl Flights
- Figure 3 All Collision Risk Target Wader and Wildfowl Flights
- Figure 4 All Target Raptor Flights
- Figure 5 All Collision Risk Target Raptor Flights
- Figure 6 Black Grouse and Breeding Raptor Survey Area's and Results
- Figure 7 Location of South Tayside Goose Roosts SPA

4. Landscape and Visual Impact Assessment

No Figures

5. Archaeology and Heritage Statement

- Figure 1 Site location plan
- Figure 2 Recorded cultural heritage sites and summary development proposals
- Figure 3 Designated cultural heritage sites in the vicinity of the site and photograph locations
- Figure 4 Extract from the 1880 Map of Keillour Estate
- Figure 5 Aerial photograph taken in 1988
- Figure 6 Remains of a possible shieling in the south-west part of the site
- Figure 7 View to site from immediately south-east of Keillour Garden
- Figure 8 View towards the site from immediately east of Keillour Garden
- Figure 9 View south-east from lane across Keillour Garden towards Strathearn
- Figure 10 View north-east towards secluded setting of Keillour Castle, from lane to south-west

- Figure 11 View to site from lane to south-west of Keillour Garden
- Figure 12 View towards Keillour Garden from lane to east of site
- Figure 13 View towards Keillour Garden from proposed turbine location
- Figure 14 View to site from roadside to the west of East Tulchan
- Figure 15 View to site from roadside to the east of Trinity College Lodge

6. Transport and Access Statement

No Figures

7. Noise Assessment

Figure 1 Noise Contour Plan

8. Aviation Report

No Figures

9. Telecommunications Report

No Figures

10. Summary & Conclusion

No Figures

APPENDICES

1. Introduction

Appendix A	Screening Opinion Request
Appendix B	Screening Opinion

2. Construction Effects

Appendix A	Construction Programme
Appendix B	Figures (Figure 1 Site Layout) (Figure 2 Typical Access Tracks) (Figure 3 Typical Wind Turbine Generator Detail) (Figure 4 Typical Cable Trench and Road Cross Sections) (Figure 5 Typical Control Building)

3. Ecological Assessment

Extended Phase 1 Habitat Survey:

Appendix A	Phase 1 Habitat Survey Target Notes
------------	-------------------------------------

Bat Activity Surveys 2011 Report:

Appendix A	Bat Survey Results
------------	--------------------

Ornithology Surveys 2011:

Appendix A	Vantage Point Survey Effort and Conditions
Appendix B	Survey Results
Appendix C	Collision Risk Model

4. Landscape and Visual Impact Assessment

Appendix A	Site Layout and Location Plan
Appendix B	Detailed Assessment Methodology
Appendix C	Zone of Theoretical Visibility (ZTV) to Wind Turbine Blade Tip and Photoview Locations
Appendix D	Environmental Designations
Appendix E	National Character Areas (NCAs) and Local Landscape Character Area (LCA) Extracts
Appendix F	Photoview Wireframes and Photomontages (REFER TO SEPARATE MONTAGE A3 FOLDER)
Appendix G	Cumulative ZTV and Wireframes
Appendix H	Landscape Mitigation Plan

5. Archaeology and Heritage Statement

Appendix A	Gazetteer of Recorded Heritage Assets and Other Elements of the Historic Environment
------------	--

Appendix B	Building Survey
------------	-----------------

6. Transport and Access Statement

Appendix A	Visual Route Inspection (VRI) Report
------------	--------------------------------------

Appendix B	Swept Path Analysis (SPAn)
------------	----------------------------

Appendix C	Annual Average Daily Traffic (AADT) Measurement Point
------------	---

7. Noise Assessment

Appendix A	Manufacturers Noise Data
------------	--------------------------

8. Aviation Report

Appendix A	MoD Consultation Response
------------	---------------------------

Appendix B	CAA Consultation Response
------------	---------------------------

Appendix C	NATS Consultation Response
------------	----------------------------

9. Telecommunications Report

Appendix A	BBC Wind Farm Tool Response
------------	-----------------------------

Appendix B	Spectrum Licensing (Ofcom) Response
------------	-------------------------------------

Appendix C	Joint Radio Company Response
------------	------------------------------

Appendix D	Atkins Response
------------	-----------------

10. Summary & Conclusion

No Appendices

1 INTRODUCTION

1.1 Introduction

This compendium of environmental reports accompanies a planning application submitted on behalf of ClearWinds Limited for the erection of a single wind turbine with a maximum rated capacity of up to 900kW and a maximum tip height of 77m at Drummick, Glenalmond, Perth. The site context of the application site in relation to the wider landscape is shown on **Figure 1** and the application area is shown on the site location plan on **Figure 2**. **Figure 3** identifies the site layout showing position of access tracks, cable trench, construction compound, control building and crane pad.

The description of the development as specified on the planning application forms is as follows:

“Proposed erection of a single 77m wind turbine with a maximum rated capacity of up to 900kW for a period of 25 years and erection of an anemometry mast up to 50m height for a period of 18 months”.

1.2 Environmental Issues

In order to determine the requirement for an Environmental Impact Assessment (EIA) to accompany the planning application the applicant requested (on 23rd September 2011) a formal screening opinion request (see **Appendix A**) from Perth and Kinross Council in accordance with Regulation 6 of the Environmental Impact Assessment (Scotland) Regulations 2011. Perth and Kinross Council issued their formal screening opinion (see **Appendix B**) on 13th October 2011 confirming that an EIA was not required to accompany the planning application as the proposed development was not likely to have significant effects on the environment by virtue of its size, nature and location.

However, in recognition the proposed development may have a potential effect on the environment the applicant has commissioned a number of reports to identify any possible environmental effects.

The environmental reports commissioned have been prepared to address the environmental issues which are considered pertinent to both the construction and operational phases of the proposed development. These are as follows:

- Construction Effects
- Ecological Assessment
- Landscape and Visual Assessment
- Archaeology and Cultural Heritage Statement
- Transport and Access Statement
- Noise Assessment
- Aviation Assessment; and
- Telecommunications Assessment

1.3 Site Context

The proposed turbine development area is located in a rural area between Glenalmond approximately 1km to the north and Keilour approximately 2.5km south / south-east. An unclassified road passes east of the site area in a north – south direction, leading to Drummick. Buchanty Burn lies a little further west from the site area. Existing land use within the site comprises grazing land which is surrounded by pasture land and forestry within the wider area. Overhead cables transect the eastern end of site at a section running between Easter Buchanty and Bellour.

The proposed location of the turbine lies outside of any 'sensitive area'. There are no Sites of Special Scientific Interest (SSSI) within or adjacent to the site; the closest being Methven Moss over 5km south east, a second SSSI, Connachan Marsh is 8km south west. There are no National Parks within or close to the site – the nearest being Loch Lomond and The Trossachs National Park over 66km to the west. The site is not within or close to any World Heritage Sites or Scheduled Monuments (SMs). The closest SMs are Fendoch Burn Roman Fort, Sair Law burial mound and Inchaffray Abbey approximately 4km away. The site is not within a National Scenic Area, the closest being River Tay (Dunkeld) approximately 15km north of the site. There are no Ramsar Sites, Special Protection Areas (SPAs) or Special Areas of Conservation (SAC) (European designations under the Habitats Regulations) within or adjacent to the site. The closest SAC is Methven Moss 5km away. The closest Ramsar Site and SPA is South Tayside Goose Roosts approximately 10km south east.

1.4 Description of Proposed Development

Proposed Development

The proposal is for the erection of a single wind turbine with a maximum rated capacity of up to 900kW for a duration of 25 years benefiting from the Feed-in Tariff (FIT) programme which will see renewable energy fed into the grid, thus representing a contribution to the UK's renewable energy targets. The turbine would have a maximum tip height of 77m and a hub height of 50m. In addition the scheme will include erection of an anemometry mast up to 50m height for a period of 18 months as a pre-cursor to the turbine. The site is approximately 0.8 hectares.

The turbine and met mast co-ordinate are located at Grid Reference 295306 726818.

The development proposals would assist in the wider need to protect natural resources and provide for the sensitive exploitation of renewable energy sources, all in accordance with national, regional and local policy guidance.

Grid Connection

Underground cabling will link the turbine to the on site substation. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time to minimise ground disturbance cables will be laid adjacent to the access tracks as shown on the layout plan **Figure 3**.

1.5 Public Consultation

ClearWinds Limited has undertaken public consultation in respect of the above development, prior to the preparation and submission of the application to Perth and Kinross Council for planning permission. The aim of the consultation process was to seek the views of interested parties on the proposals to assist in the preparation of the planning application.

A leaflet was prepared describing the scheme proposal and information on work commissioned and work in progress. A questionnaire section was included within the leaflet which had a mix of scheme specific questions and more general ones about renewable energy and space for any other comments and suggestions about the scheme. The leaflet was hand delivered to local residents within a radius of 3km of the proposal.

Out of the 70 homes which received a leaflet and feedback form only 14 residents completed and returned the form. Of the 14 completed questionnaires, on balance there was an overall majority of residents in favour of the proposals at Drummick.

1.6 Structure of the Environmental Reports Compendium

This document comprises a series of assessment reports regarding each of the environmental issues which have been identified as being of relevance in the consideration of this application. These studies are

presented as standalone reports, including figures and appendices where appropriate. The compendium is structured as follows:

- **Section 1** introduces the proposed development and identifies the key environmental issues which the following reports address. It also sets out the structure of the compendium.
- **Section 2** is a construction effects report which considers construction times, site access, track layout and design, foundations, grid connection and turbine erection.
- **Section 3** is an ecological assessment which ascertains the ecological value of the site and surrounding area and identifies any significant habitats and associated flora and fauna which require conservation and enhancement and considers specific protected species surveys.
- **Section 4** is a landscape and visual assessment of the proposals which evaluates possible effects on sensitive receptors and the landscape resource.
- **Section 5** is an archaeology and cultural heritage assessment of the resource present at the site and the surrounding area which details the possible effects of the development proposals on these features.
- **Section 6** considers transport and access requirements associated with delivery of components parts of the turbines and delivery of blades;
- **Section 7** contains an assessment of noise according to the recommendations of ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*.
- **Section 8** considers and presents the findings of aviation analysis
- **Section 9** considers and presents the findings of telecommunication analysis
- **Section 10** provides an overview and summary of the findings of the environmental reports.

The environmental consultants who have undertaken the assessments included in this compendium are referenced in the project directory at the front of this document.

Figure 1

Site Context Plan

KEY

Proposed Site Location



Drumlick, Glenalmond

Site Context Plan

Checked by : AR

Drawn by : JS

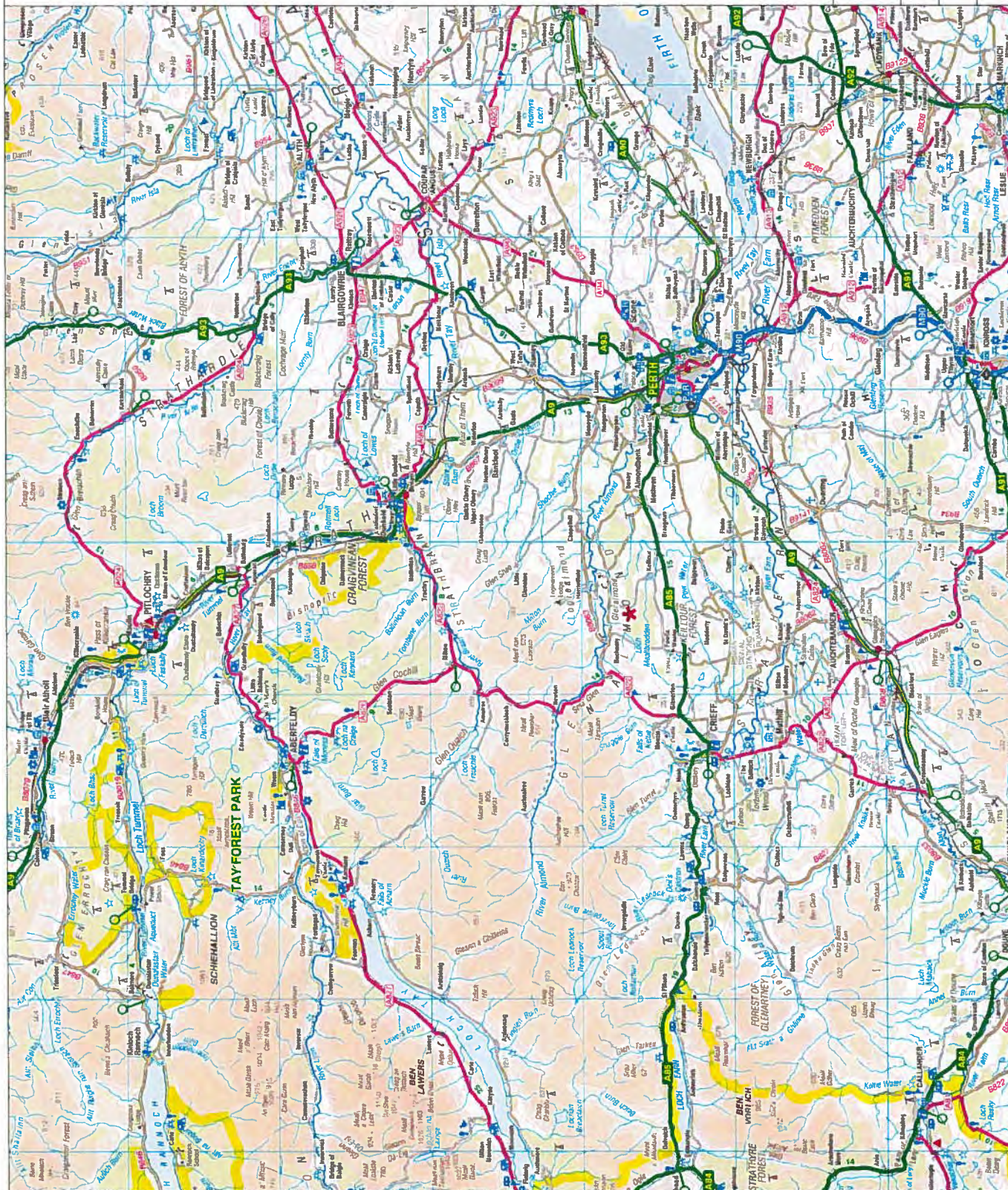
Date : 15.11.11

C.0362_18-B

Pegasus
Environmental



0 5km 10km



T 01285 641717 | F 01285 642348 | www.pegasus.co.uk

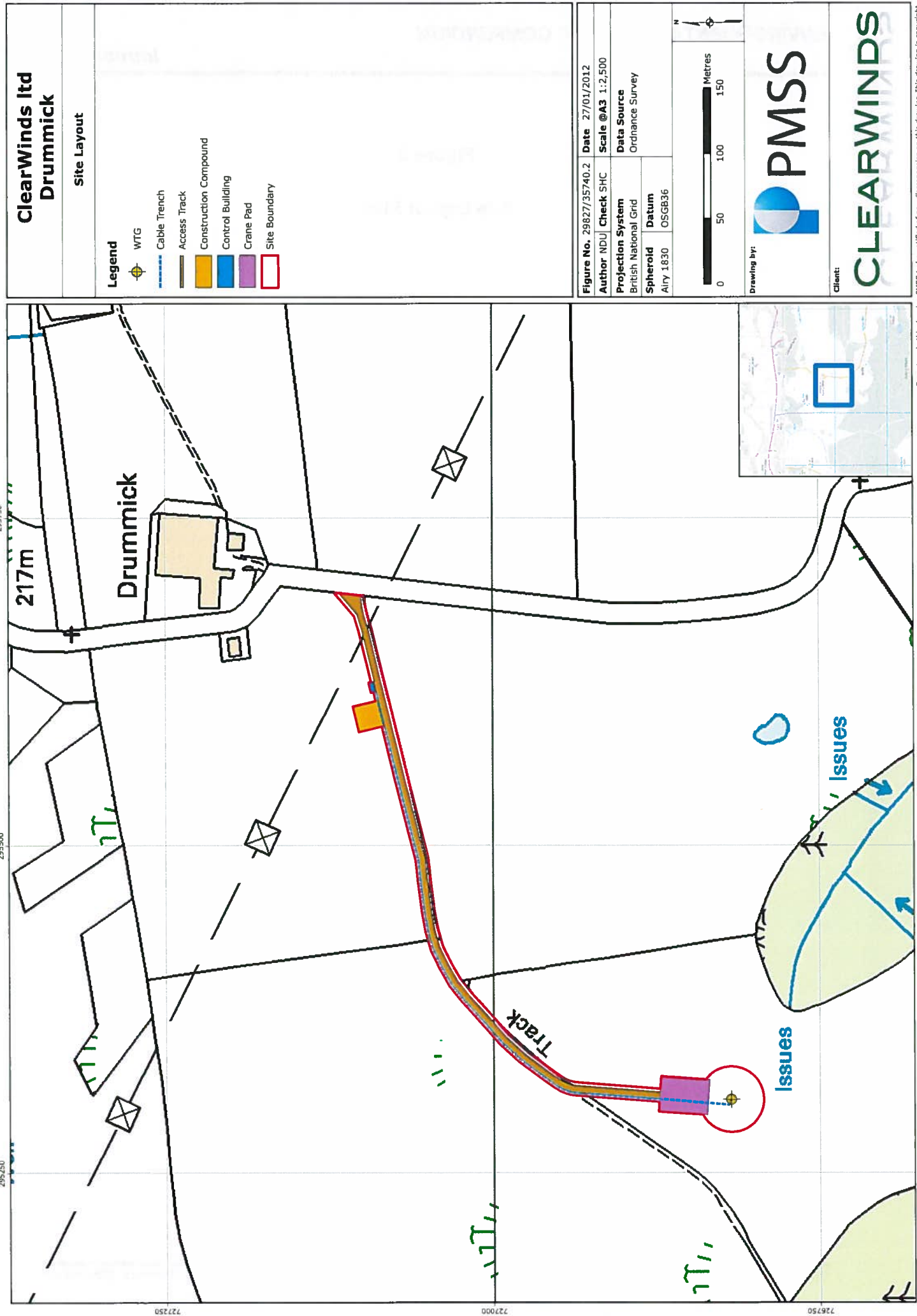
Copyright © 2011 Pegasus Environmental. All rights reserved. This map is for reference only and should not be used for navigation. The map is not to be used for any other purpose without the written consent of Pegasus Environmental.

Figure 2

Site Location Plan

Figure 3

Site Layout Plan



Appendix A

Screening Opinion Request

AC/AVR/CIR.C.0362/230911

23rd September 2011

Planning Officer
Perth & Kinross Council
2 High Street
Perth
PH1 5PH

For the attention of Mr. D. Niven

Dear Sir/Madam,

Re: Proposed Wind Turbine, Drummick, Glenalmond, Perth
Environmental Impact Assessment (Scotland) Regulations 2011:
Regulation 6 Request for a Screening Opinion

Following receipt of your Screening Opinion on 21 October 2010 confirming an EIA would not be required for proposals of 3 wind turbines at Drummick and following recent issue of the Environmental Impact Assessment (Scotland) Regulations 2011 together with a reduction of the scheme proposals to a single turbine, we write on behalf of ClearWinds Ltd. to formally request an updated Screening Opinion to determine whether an Environmental Impact Assessment (EIA) is required to be submitted for a proposed wind turbine at the above location.

This request is made under Regulation 6 of the Environmental Impact Assessment (Scotland) Regulations 2011. As required under this Regulation, please find enclosed a plan identifying the location of the proposed development area, together with a brief description of the proposal and its possible effects on the environment.

Site Location

A location plan is enclosed for your reference. The proposed turbine development area is located in a rural area between Glenalmond approximately 1km to the north and Keilour approximately 2.5km south / south-east. An unclassified road passes through the site area in a north – south direction, leading to Drummick. Buchanty Burn lies a little further west from the site area. Existing land use within the site comprises grazing land which is surrounded by pasture land and forestry within the wider area. Overhead cables transect the site at a section between Easter Buchanty and Bellour.

Development Proposal

The proposal is for the erection of a single wind turbine with a maximum rated capacity of 900kW for a duration of 25 years benefiting from the Feed-in Tariff (FIT) programme which will see renewable energy fed into the grid as well as consumed on site, thus representing a contribution to the UK's renewable energy targets. The turbine would have a maximum tip height of 77m.

Pegasus House
Querns Business Centre
Cirencester
Gloucestershire
GL7 1RT

T 01285 641717

F 01285 642348

Also at:
Birmingham
Bracknell
Bristol
Cambridge
Leeds
Manchester
Nottingham

Pegasus Planning Group is the trading name of Pegasus Planning Group Limited, registered in England and Wales under number 07277000

Registered Office:
Pegasus House,
Querns Business Centre,
Whitworth Road, Cirencester,
Gloucestershire, GL7 1RT

Requirement for an EIA

The proposal falls within the category of 'Energy Industry' projects under Schedule 2 (3 i) as described in the EIA (Scotland) Regulations. The proposed location of the turbine is not situated within a 'sensitive area' as defined in Regulation 2 (1). The proposal exceeds the threshold for wind power projects within Schedule 2 (3 i) which defines a proposal as being Schedule 2 development. Development proposals described as Schedule 2 development require an EIA if they are considered likely to have significant effects on the environment by virtue of factors such as nature, size or location. It is therefore necessary to Screen the proposal with the Local Planning Authority to determine if there are significant effects likely to arise from the proposal (see paragraph 45 of Planning Circular 3/2011).

The Screening process should consider the development proposal against the criteria and thresholds which are included within the EIA (Scotland) Regulations in determining whether or not an EIA is required to accompany an application. Schedule 3 of the EIA (Scotland) Regulations provides selection criteria for Screening Schedule 2 development, which includes three broad categories for consideration: the characteristics of the development; the environmental sensitivity of the location; and the characteristics of the potential impacts.

Planning Circular 3/2011 provides guidance on the EIA (Scotland) Regulations, in particular, Paragraph 52 of Planning Circular 3/2011 states *'it is not possible to formulate criteria or thresholds which will provide a universal test of whether or not EIA is required. The question must be considered on a case-by case-basis'*. Significance of effects are assessed on whether a *'particular type of development and its specific impacts are likely in that particular location'*

In addition to this, Paragraph 50 specifies *'Consideration should be given to development which could have complex, long term or irreversible impacts, and where expert and detailed analysis of those impacts would be desirable and would be relevant to the issue of whether or not the development should be allowed. Industrial development involving emissions which are potentially hazardous to humans and nature may fall into this category'*.

With reference to Paragraphs 50 and 52 together with Regulation 2 (1), it is considered that an application for the development proposal described above would not warrant the submission of an environmental statement for the following reasons:

- the development will be for a single turbine up to 900kW where the localised size and limited extent of the site area for this proposal is not considered to have wide-ranging effects;
- the proposed location of the turbine lies outside of any 'sensitive area'. There are no Sites of Special Scientific Interest (SSSI) within or adjacent to the site; the closest being Methven Moss over 5km south east, a second SSSI, Connachan Marsh is 8km south west. There are no

National Parks within or close to the site – the nearest being Loch Lomond and The Trossachs National Park over 66km to the west. The site is not within or close to any World Heritage Sites or Scheduled Monuments (SMs). The closest SMs are Fendoch Burn Roman Fort, Sair Law burial mound and Inchaffray Abbey approximately 4km away. The site is not within a National Scenic Area, the closest being River Tay (Dunkeld) approximately 15km north of the site. There are no Ramsar Sites, Special Protection Areas (SPAs) or Special Areas of Conservation (SAC) (European designations under the Habitats Regulations) within or adjacent to the site. The closest SAC is Methven Moss 5km away. The closest Ramsar Site and SPA is South Tayside Goose Roosts approximately 10km south east.

- the proposal does not present complex, long term or irreversible effects;
- the wind turbine is proposed for a duration of 25 years and eventual decommissioning of the turbine will leave behind no legacy of landscape scars or environmental hazards;
- the proposal is not an industrial development and does not present potentially hazardous environmental effects to humans and or nature;
- the proposal is temporary and reversible and will contribute to carbon savings.

Given that the location of the site is not within any sensitive location, the benign nature of the development proposal, and the limited environmental value of the turbine location, it is considered whilst there will be some effects upon the environment as a consequence of the scheme, none of these are considered to constitute 'significant effects'. Accordingly, it is considered that the proposal does not constitute EIA development and would not require an Environmental Statement to be submitted with a planning application for the scheme.

In acknowledgment of the potential for the scheme to create some effects on the environment, ClearWinds Ltd. proposes to commission several supporting studies to identify the effects of development of the site. It is proposed that these studies will be submitted as an accompaniment to any planning application for the proposal. These will include a landscape and visual assessment, an ecology assessment as well as a noise assessment to provide details of noise specifications for the proposed turbine to confirm no sensitive receptors in the vicinity will be adversely affected. It is proposed that these studies are submitted to ensure that appropriate regard is given to environmental considerations in determining the acceptability of the development.

We believe this approach will provide the Local Authority with all the necessary information concerning the effects of the development to enable it to make an informed decision regarding the proposal.

We look forward to receiving the Council's Screening Opinion within the three week timeframe specified by the Regulations. In the meantime, should you have any queries or require any further information please do not hesitate to contact me or my colleague Annabel Roberts.

Yours faithfully,



Andy Cook
Director (Environmental)
andrew.cook@pegasuspq.co.uk

Enc. Location Plan: drawing no. C.0362_01-1

Cc: W Clare – ClearWinds Ltd

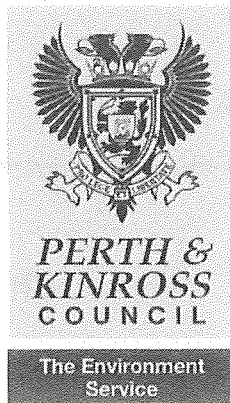
Appendix B

Screening Opinion

PERTH & KINROSS
COUNCIL

**Delayed Office Opening for
Employee Training**

*This Office will be closed from 8.45 am –
11.00 am on the 1st Thursday of each
month*



Planning and Regeneration
Head of Service **David Littlejohn**

Pullar House 35 Kinnoull Street
Perth PH1 5GD
Tel 01738 476500 Fax 01738 475310

Pegasus Planning Group
Pegasus House
Querns Business Centre
Cirencester
Gloucestershire
GL7 1RT

Contact: David Niven
Direct Dial: 01738 475345
E-mail: DRANiven@pkc.gov.uk

Our ref 10/01070/PREAPP

Your ref N/A

Date 13 October 2011

FAO Andy Cook

Dear Sir/Madam,

**Request for Screening Opinion: Proposed Wind Turbine with an estimated tip
height of 77 metres on land at Drummick, near Glenalmond**

As a schedule 2 Development under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 your proposal is required to be screened to determine whether an Environmental Statement is required, and whether this should form part of any formal planning application.

This process has been undertaken and I can inform you that the Council holds the view that an Environmental Statement **is not** required in this instance. The Council has taken cognisance of Scottish Government's and The European Commission's screening checklist and determined that the proposed development is unlikely to have significant effects on the environment by virtue of factors such as its size, nature or location. A copy of the Council's Screening Opinion is attached for your perusal.

Please be advised that competent supporting information will be required to support any forthcoming application. Scottish Natural Heritages document 'Natural Heritage assessment of small scale wind energy projects which do not require formal Environmental Impact Assessment (EIA)' will be of particular relevance which is available by following the attached link <http://www.snh.gov.uk/docs/C206956.pdf>.

I trust the above is of assistance at this stage.

Yours faithfully

David Niven
Planning Officer
Development Management

Jim Irons
Executive Director

1053



Environmental Impact Assessment (Scotland) Regulations 1999

EIA SCREENING OPINION

Part I - Particulars of Screening Request/Planning Application

Applicant's Name & Address	Agent/Applicant's Name & Address
ClearWinds Ltd C/o Agent	Andy Cook Pegasus Planning Group Pegasus House Querns Business Centre Cirencester Gloucestershire GL7 1RT

Date Request/Application received	Application Ref. (if applicable)
13 th October 2011	10/01070/PREAPP

Site Location	Description of Proposal
Land At Drummick Near Glenalmond Perth	Erection of a Wind Turbine with a maximum height of 77m

Part 2 - Particulars of Screening Decision

Perth and Kinross Council hereby give notice, in accordance with the provisions of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 that the development referred to in Part I above is **unlikely** to have significant effects on the environment. The Council's reasons for reaching this conclusion are set out below.

1. Does the development fall within schedule 2, and if it does, does the development meet the relevant thresholds and criteria in schedule 2?

The relevant extract from the table in schedule 2 is set out below and highlights the thresholds and criteria for the Energy Industry:

3. Energy industry

(i) Installations for the harnessing of wind power for energy production (wind farms).

(i) The development involves the installation of more than 2 turbines; or
(ii) the hub height of any turbine or height of any other structure exceeds 15 metres.

This proposal qualifies as a Schedule 2 Development under the above regulations, as the proposal is for the erection of one turbine with a hub height of 15 metres.

2. Does the development fall within a sensitive area?

In terms of the EIA Regulations "sensitive area" means any of the following:

Site of Special Scientific Interest
Land subject to Nature Conservation Orders
International Conservation Sites
National Scenic Areas
World Heritage Sites
Scheduled Ancient Monuments
National Parks

Circular 08/2007 advises that the likely environmental effects of Schedule 2 development will often be such as to require EIA if it is located in or close to sensitive sites. The circular advises that other statutory and non-statutory designations may also be relevant in determining whether EIA is needed, such as local landscape or biodiversity designations.

The site identified within your screening request lies in close proximity to a non-statutory designation, namely:

- Keillour Castle Historic Garden and Designed Landscape 1.8km to south east of site.

A number of statutory designations also lie in proximity to the site:

- River Almond (River Tay) Special Area of Conservation (SAC) 1.2km north of site.

- Methven Moss Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) 4.5km south east of site.

3. Is the development likely to have a significant effect(s) on the environment?

Paragraph 39 of Circular 3/2011 sets out the considerations that are required to be taken into account in determining whether EIA is needed, it states:

"The regulations reflect the requirement in the Directive to determine whether the proposed development is likely to have a significant effect(s) on the environment by virtue of factors such as 'its nature, size or location'. The word 'or' suggests the EIA may be required by reason of just one of these factors."

Paragraph 40 states that:

"For many types of development, perhaps the majority, it will be necessary to consider the characteristics of the development in combination with its proposed location in order to identify the potential for interactions between a development and its environmental effects. In determining whether a particular development is likely to have such effects, authorities must take account of the selection criteria in Schedule 3 in Schedule 3 of the Regulations (Annex A of the Circular). Three categories of criteria are listed:

- *Characteristics of Development*
- *Location of development*
- *Characteristics of the potential impact"*

The Scottish Government and The European Commission have prepared checklists. I have taken cognisance of these checklists in the assessment of the characteristics and location of the development, the potential impacts upon the environment are identified below.

Characteristics of the development

- The development will introduce a large scale structure into the environment at a height of 77.0 metres (maximum tip height).
- The development will result in further consequential development (requirement to connect to the grid).
- There may be a potential cumulative impact with other electricity and wind energy infrastructure within the area.
- There may be electromagnetic interference with nearby sensitive equipment.
- There may be noise from the development associated with the construction and operation of the infrastructure. There may be associated noise with construction and operational traffic.
- The development has the potential to impact on watercourses and hydrology due to the construction process and formation of access to the site.

- Potential physical changes from construction and operation of the development will occur, instillation of energy infrastructure will result in a change to the existing land use for the lifetime of the development until decommissioning. Development is likely to include pre-construction investigation, excavation, construction works, temporary site for housing workers/ materials, new diverted transmission lines, decommissioning and restoration works.

Location of the Development.

- The existing landuses on and around the site could be affected by the development, for example homes, gardens, recreation, agriculture.
- The development is located in a predominantly undeveloped area.
- There is the potential for an impact on groundwater resources, surface waters, agriculture.
- The site is located approximately 1.2km away from the River Tay SAC.
- The site is in close proximity Keillour Castle Historic Garden and Designed Landscape.
- The site is in close proximity to a listed building (Keillour Castle)

Characteristics of the potential impact

I have evaluated the potential significance of each environmental effect identified above using the second checklist of Annex B. This checklist is designed to help decide whether the interactions identified between the development and location are likely to be significant.

It is the opinion of the planning authority having taken account of the characteristics of the potential impact of the development, in terms of extent, transboundary nature, magnitude, complexity, probability, duration, frequency and reversibility that it is unlikely to have a significant effect on the environment. A detailed study through an **EIA is therefore not needed**. This Screening Opinion should not be taken as implying that the planning authority considers this to be an acceptable development in this location.



 Development Quality Manager
The Environment Service
Perth and Kinross Council

Dated: 13 October 2011




Drummick

Drummick Wind Turbine:
Construction Effects Report

Drummick

Drummick Wind Turbine: Construction Effects Report

Document Control

Responsible for	Job Title	Name	Date	Signature
Content	Project Manager	Ben Pollard	2011-11-18	
Checked	Development Consultant	Stephanie Clarke	2011-11-23	
Approval	Director	David Bean	2011-11-28	

Copyright: PMSS ©

Document Reference:

29827

Signatures in this approval box have checked this document in line with the requirements of QP16

This report has been prepared by Project Management Support Services Ltd with all reasonable skill and care, within the terms of the contract with the Client. The report contains information from sources and data which we believe to be reliable but we have not confirmed that reliability and make no representation as to their accuracy or completeness.

The report is confidential to the Client and Project Management Support Services Ltd accepts no responsibility to any third party to whom information in this report may be disclosed. No part of this document may be reproduced without the prior written approval of Project Management Support Services Ltd

Record of Changes

Revision Number	Date	Page Number	Description	Approved
A	2011-11-07	All	Draft	DB
B	2012-03-01	All	Draft Amendments	DB
C				
D				
E				
F				
G				
0	2011-11-28	All	Client Issue	DB
1	2012-03-01	All	Client Issue	DB
2				
3				
4				
5				
6				

Distribution List

#	Function Title	Company	Name (optional)
1	Director	ClearWinds Limited	William Clare
2	Project File 29827	PMSS Ltd	Bath Server
3	Senior Environmental Planner	Pegasus Planning Group	Annabel Roberts
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Notes:

Table of Contents

1.	Construction	5
1.1.	Indicative Programme	5
1.2.	Construction Times	5
1.3.	Site Access and On-site Tracks	5
1.3.1.	Track Layout and Design	6
1.3.2.	Track Construction Methodology	6
1.4.	Wind Turbine	6
1.5.	Wind Turbine Foundation	6
1.6.	Wind Turbine Transformer Foundation	6
1.7.	Crane Hard Standing	7
1.8.	Stone and Concrete Requirements and Sourcing	7
1.9.	Erection of Turbine	7
1.10.	Site Accommodation and Temporary Works	8
1.11.	Restoration and Reinstatement	8
1.12.	Decommissioning	8
2.	Grid	8
2.1.	Overview	8
2.2.	WTG Transformers	9
2.3.	On-Site Underground Cables	9
2.4.	On-Site Control Building	9
2.5.	Installation programme	9
3.	Summary	10
	Appendix 1: Construction Programme	11
	Appendix 2: Figures	12

Abbreviations

DNO	Distribution Network Operator	LPA	Local Planning Authority
GRP	Glass Reinforced Plastic		
HGV	Heavy Goods Vehicle	WTG	Wind Turbine Generator

Figures

- Figure 1: Site Layout
- Figure 2: Typical Access Tracks
- Figure 3: Typical Wind Turbine Generator Detail
- Figure 4: Typical Cable Trench and Road Cross Sections
- Figure 5: Typical Control Building

1. Construction

The construction period for Drummick will be approximately four months. The construction process will entail the following elements:

- Construction of a new entrance bell mouth for access to the site
- Construction of new site tracks, (upgrades to the existing farm grade tracks on site required)
- Construction of temporary construction compound for the site facilities
- Construction of a crane hard standing
- Construction of the WTG foundation and turbine transformer housing
- Construction of the onsite control building
- Excavation and cable laying within the cable trenches
- Connection of onsite cabling
- Delivery and erection of the WTG
- Commissioning of the site infrastructure
- Site restoration

Many of these elements will be carried out concurrently, although predominantly in the order identified, in order to reduce the overall length of the construction programme. Site restoration will be planned and carried out in order to restore any affected areas as early as possible.

1.1. Indicative Programme

An indicative programme for the construction phase is displayed in **Appendix 1**. The starting date for construction will be dictated by the date that planning is achieved and closure of the contracts for the construction.

1.2. Construction Times

For the purposes of this Environmental Report, construction involving the arrival and departure of the Heavy Goods Vehicles (HGVs) and those activities where the noise may be audible at the site boundary will be limited to the hours of 08.00 to 18.00 Monday to Friday. However, turbine deliveries may take place over the weekend with prior agreement from the Local Planning Authority (LPA) and the Police. On site working has been assumed to extend outside of this time boundary and include the weekend.

1.3. Site Access and On-site Tracks

There is one principal access point to the site located on a C classified road south of Drummick Farm Cottage, with post code reference PH1 3SF. All sources of traffic associated with the construction of the site will use this main entrance as the access point. **Figure 1** of **Appendix 2** details the site layout

Approximately 502m of upgrades to existing farm tracks or new access tracks are required to be constructed. The access track construction will generally be 5m wide and range from 350mm to 500mm in depth, typical track cross sections are shown in **Figure 2** of **Appendix 2**

Further details relating to the movement of traffic on and off the site are reported in the Traffic and Transport report.

1.3.1. Track Layout and Design

There are various constraints which have influenced the track layout design, some generic and some site specific.

- Track length is kept to a minimum wherever possible
- Tracks are routed to avoid any sensitive areas
- Tracks utilise as much existing farm tracks as feasible.

The final track design resulted from the optimisation of the above criteria.

1.3.2. Track Construction Methodology

Top soil to a depth of approximately 100mm will be stripped from the track and stored to one side for use in the restoration of the site. Approximately 200-300mm of material will be excavated before the crushed stone surface is installed.

The access tracks on site will be 5m wide to accommodate the delivery vehicles required and cranes utilised in turbine installation. At bends the tracks will widen as appropriate dependent on bend radius and to a maximum of approximately 8.5m. The edges of the tracks will be allowed to re-vegetate, maintaining the minimum working width of 5m throughout the operation and maintenance period. All tracks will be unpaved and constructed from locally quarried stone where available.

Water crossings have been avoided in the site layout. However, if necessary due to any micro siting requirements, a simple culvert type construction will be employed. The size of any culvert will depend on the water flow and other location specifics; in this case a design shall be submitted to the authority for prior approval.

1.4. Wind Turbine

At present the specific model of WTG has yet to be selected, this will be subject to a competitive tender; however the turbine will be typically as discussed below.

The turbine is of horizontal axis type with a rotor consisting of three blades. The blades are mounted to the wind turbine hub or nacelle at a height of a maximum 50m. This gives a maximum tip height of 77m, as shown in **Figure 3** of **Appendix 2**. The turbine tower will typically consist of 2 or 3 tower sections, the lower of which will be mounted to the wind turbine foundation.

1.5. Wind Turbine Foundation

The WTG will be installed on a reinforced concrete foundation. The foundation will typically measure 12m by 12m in plan and to a depth of 2.3m. The foundation will be back filled with excavated materials and allowed to re-vegetate using the stripped top soil. The WTG foundation could be larger or smaller depending on the final WTG selection and the ground conditions at the location.

1.6. Wind Turbine Transformer Foundation

At present the WTG manufacturer is not known, and therefore it is possible that the WTG may require an external transformer housing. The transformer housing will measure approximately 2m by 2m and 2m high and be formed of a Glass Reinforced Plastic (GRP) material. The GRP housing

will sit on a concrete reinforced foundation, which will incorporate the required electrical ducting so the transformer housed within can be interconnected with the turbine and the internal cable network.

1.7. Crane Hard Standing

The turbine requires an area of hard standing to be built adjacent to the WTG foundation. This provides a stable base on which to lay down the WTG components ready for assembly and erection and to site the two cranes necessary to lift the tower sections, nacelle and rotor into place. The hard standing will be left in place following construction in order to allow for the use of similar plant in the event of a component replacement. The hard stand could also be re used during the de-commissioning phase of the project at the end of the wind turbine's life.

The total area of hard stand at the WTG location will be approximately 1050m² (35m by 30m) and the construction will be similar to that of the tracks. The first 100mm of top soil will be stripped and stored to one side of the area and the surface formed using crushed stone material sourced where possible from a local quarry. The depth of the hard stand will be approximately 300-500mm or to a depth that will sufficiently exceed the requirements of the selected turbine and crane contractor.

1.8. Stone and Concrete Requirements and Sourcing

Stone materials for use in the construction of the access tracks and the crane hard standing are expected to be sourced from local quarries. Imported stone is expected to be sourced from a quarry to the east of the site (Perth locality) subject to competitive tender, and follow the access route as detailed in the Traffic and Transport Report.

Concrete for construction of the WTG foundation and for use in the control building construction will be sourced from a batching plant to the east of site (Perth locality) subject to competitive tender, and follow the access route as detailed in the Traffic and Transport Report.

1.9. Erection of Turbine

The foundation design will be dependent on the final WTG selected and the results from the detailed ground investigation. It is currently considered that the foundation will not require piles. Should piling be deemed necessary it is proposed to agree methodologies for this and any determining conditions with the appropriate authority.

Foundations will normally comprise a reinforced concrete base slab with the approximate dimensions of 12m by 12m by 2.3m depth. This will include a circular steel support plinth to suit the base profile of the wind turbine tower and will then be reinstated with excavated material and top soil. The design of the foundation in terms of size and depth are to minimise the excavation requirements, minimise the protrusion above ground level and allows the area to re-vegetate following construction. The final foundation design will be based on the most efficient use of materials and local ground conditions.

The WTG tower, nacelle and blades will be transported to site via low bed trailers which may incorporate rear wheel steering. The towers will be delivered in 2 or 3 sections (dependent on the selected turbine supplier) which will then be stored at the turbine location prior to erection.

One team will carry out the erection of the WTG using two cranes, a mobile support crane of approximately 100 tonne capacity and a main crane of approximately 500 tonne capacity. The WTG manufacturer chosen to supply the WTG would be responsible for the selection of the crane contractors.

1.10. Site Accommodation and Temporary Works

A temporary construction compound with approximate dimensions of 20m by 20m will be used to house the welfare facilities, the site cabins and parking area for the construction personnel.

1.11. Restoration and Reinstatement

Once the construction work has been substantially completed the temporary construction compound will be removed. All temporary welfare facilities and site cabins, equipment and machinery would be taken from site.

1.12. Decommissioning

The WTG is designed with an operational life of 25 years. At the end of this period the owner will have a number of options: apply for an extension to the permission; dismantle and decommission the WTG or re-power with newer technology (subject to permissions).

For the purpose of this document it is assumed that the WTG will be dismantled and decommissioned at the end of the operational life.

On dismantling the WTG, the sections will be removed in reverse order to that of the construction. Firstly the removal of the rotor, followed by the nacelle and the tower sections. It is likely that the components will be cut to smaller sizes at site in order to transport away via use of normal road going HGVs.

The WTG foundation shall be broken up to a depth of 500mm below the ground surface by use of excavators and spoil taken to a licensed waste establishment. The control building will be removed of all electrical infrastructures and the building given to the land owner. The cable connecting the turbine to the control building will be left buried in-situ, cut at either end to a depth of 500mm below ground level, as full excavation of the cable will cause further disturbance to the ground. The access tracks and crane pad will either be removed and the stone taken to licensed waste establishment or left in-situ for ongoing use by the landowner. This is subject to confirmation at the time of decommissioning.

2. Grid

2.1. Overview

The WTG will require an interconnection to the local electricity distribution network to permit the export of generated electricity. Connecting a generator of rating greater than 11kW in parallel with the electricity distribution network requires that an application is submitted to the local licensed electricity distribution network owner (DNO). The DNO at Drummick is Scottish Hydro Electric Power Distribution Plc, a wholly owned subsidiary of Scottish and Southern Energy group of companies.

The onsite control building will form the interface point between the WTG and the local electricity distribution network. Grid connection works between the onsite control building and the local electricity distribution network will be carried out by the DNO. If required under the Section 37 of the Electricity Act 1989, the works will be completed under a separate planning application made by the DNO.

This connection is likely to be made at 11kV; however it is subject to an offer to provide generator connection works from the Distribution Network Operator. It is anticipated that the route will be via underground cabling using trenching or ploughing as an installation method.

2.2. WTG Transformers

The WTG will generate electricity at low voltage (< 1,000 volts). A dedicated WTG transformer located either within a separate enclosure adjacent to the WTG foundation or within the tower base will 'step up' the voltage to medium voltage (MV) level (11,000 volts or higher to match the distribution network voltage) to feed into the wind turbines MV cable system. It is anticipated that the transformer will be situated within the turbine tower base.

2.3. On-Site Underground Cables

The MV cable system will interconnect the WTG transformer with the on-site control building. The wind turbine operates on three-phase power supply and consequently each phase is given its own cable. This means that within a cable trench, three MV cables will be laid. A bare copper earth rope and a fibre optic cable are typically installed within the same trench. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time of construction but typically cables will be laid in a trench 750-1000mm deep and 300-450mm wide. To minimise ground disturbance cables will be laid alongside the wind turbine access track wherever practicable. For safety reasons, underground cables are overlaid with warning tapes. Under circumstances when it is not practicable to achieve target depths of cover, additional cable protection covers made of reinforced concrete or high density polyethylene will be installed. **Figure 4 of Appendix 2** shows the trench detail.

2.4. On-Site Control Building

The control building will comprise a small single storey building of either brick, reinforced concrete or Glass Reinforced Plastic (GRP) construction. The roof of the control building is likely to be pitched with tiles or corrugated aluminium. If the roof is not pitched, a flat pre-cast concrete, GRP or painted steel construction will be used instead. The building will be windowless and have one or two sets of double doors of painted steel construction for loading/unloading of DNO and wind turbine switchgear respectively. Two single doors of painted steel construction will be provided for access to control and meter rooms respectively. The building will house electrical switchgear, control panels, communications and metering equipment. The building is likely to measure 8m by 4m and 3.5m to the eaves and 1.5m to the roof apex (if a roof is constructed). **Figure 5 of Appendix 2** shows a typical control building

2.5. Installation programme

The timescales for grid connection works are dependent on the length of grid cable required and the cable route. Typically grid connection works are completed within 12-18 months of contract commencement.

Grid connection works for the on-site control building will be approximately 1 to 3 months duration.

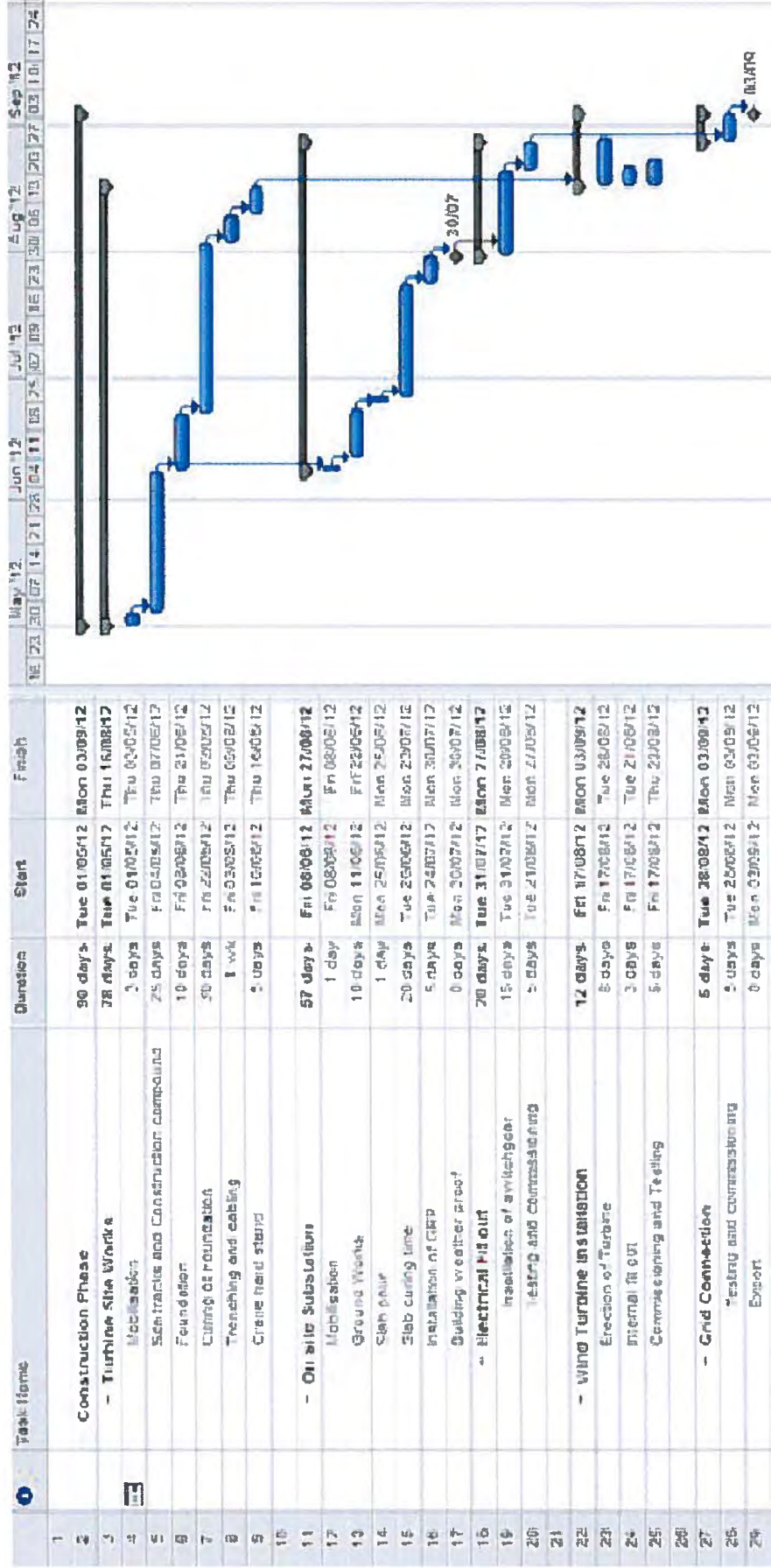
3. Summary

The construction period for Drummick will last approximately four months. The construction process will include the construction of a new entrance bell mouth, site tracks, temporary construction compound, crane hard standing, WTG foundation, turbine transformer housing, onsite control building, cable trenches and other site infrastructure. Connection of onsite cabling, delivery of the turbine itself and its erection will complete the construction process.

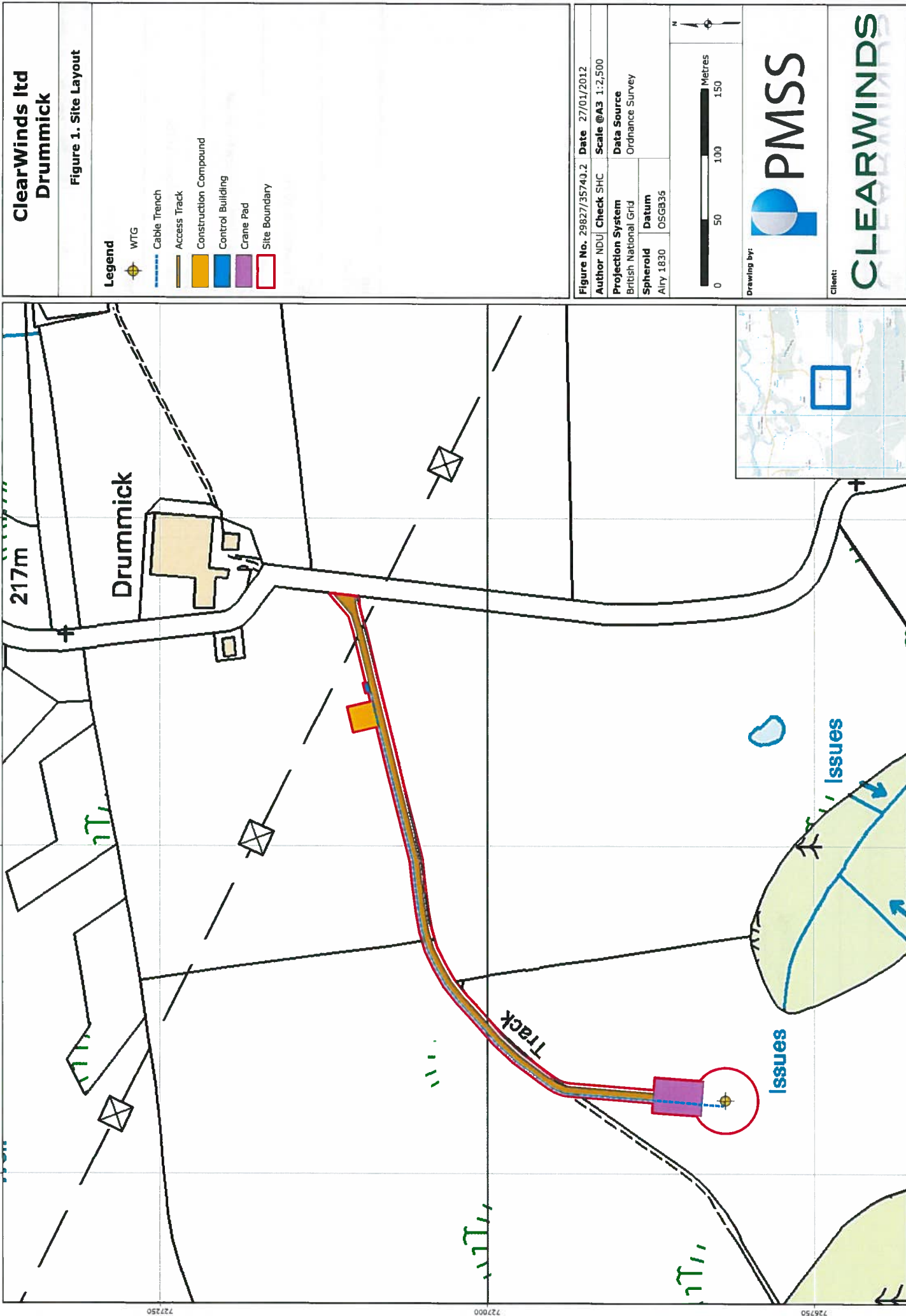
Site Restoration will be planned and carried out in order to restore any affected areas as early as possible.

The WTG will require an interconnection to the local electricity distribution network to permit the export of generated electricity. This connection is likely to be made at 11kV via underground cabling. A pending application has been made to the DNO (Scottish Hydro Electric Power Distribution PLC).

Appendix 1: Construction Programme

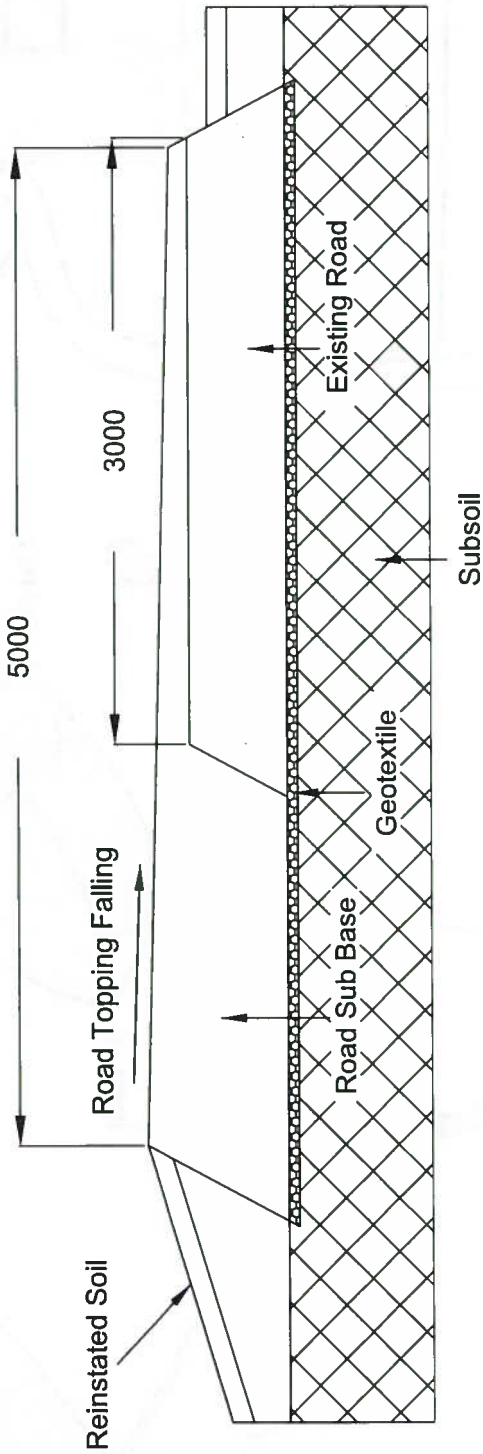


Appendix 2: Figures

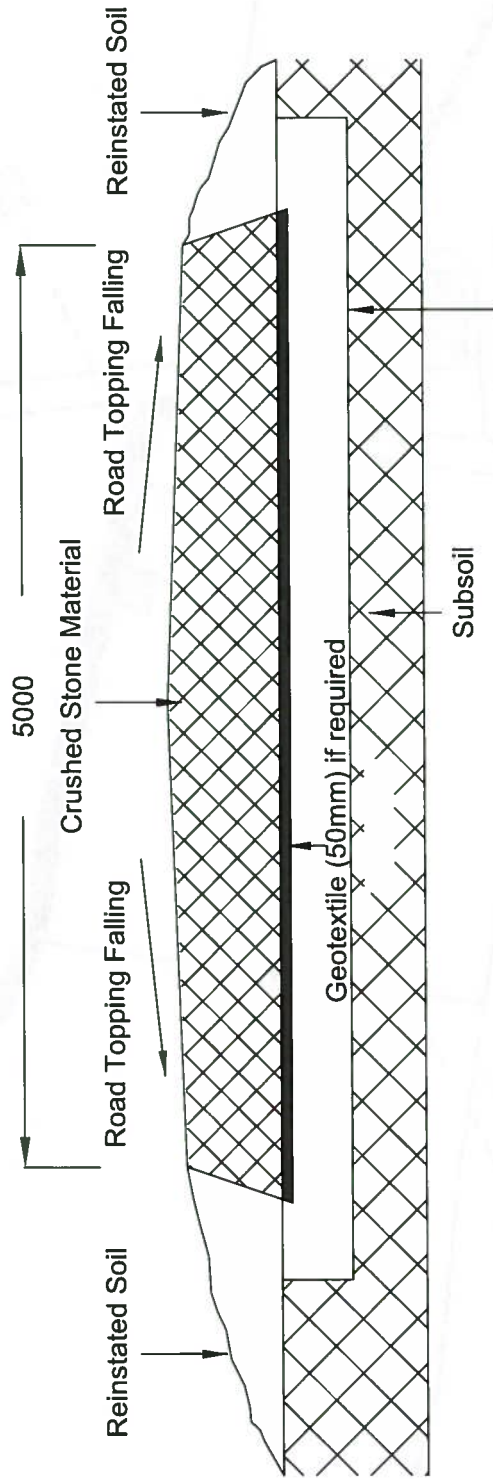


Legend:

1. All dimensions in mm unless otherwise stated



Typical Track Widening Detail



Typical Track Construction Detail

When Crossing Wet Areas, Track to be Underlaid with a Blanket of Clean Stone

Scale:
Various

Date:
21st November 2011

Project:
Drumnick - Wind Turbine Proposal

Figure:
Figure 2: Typical Access Track

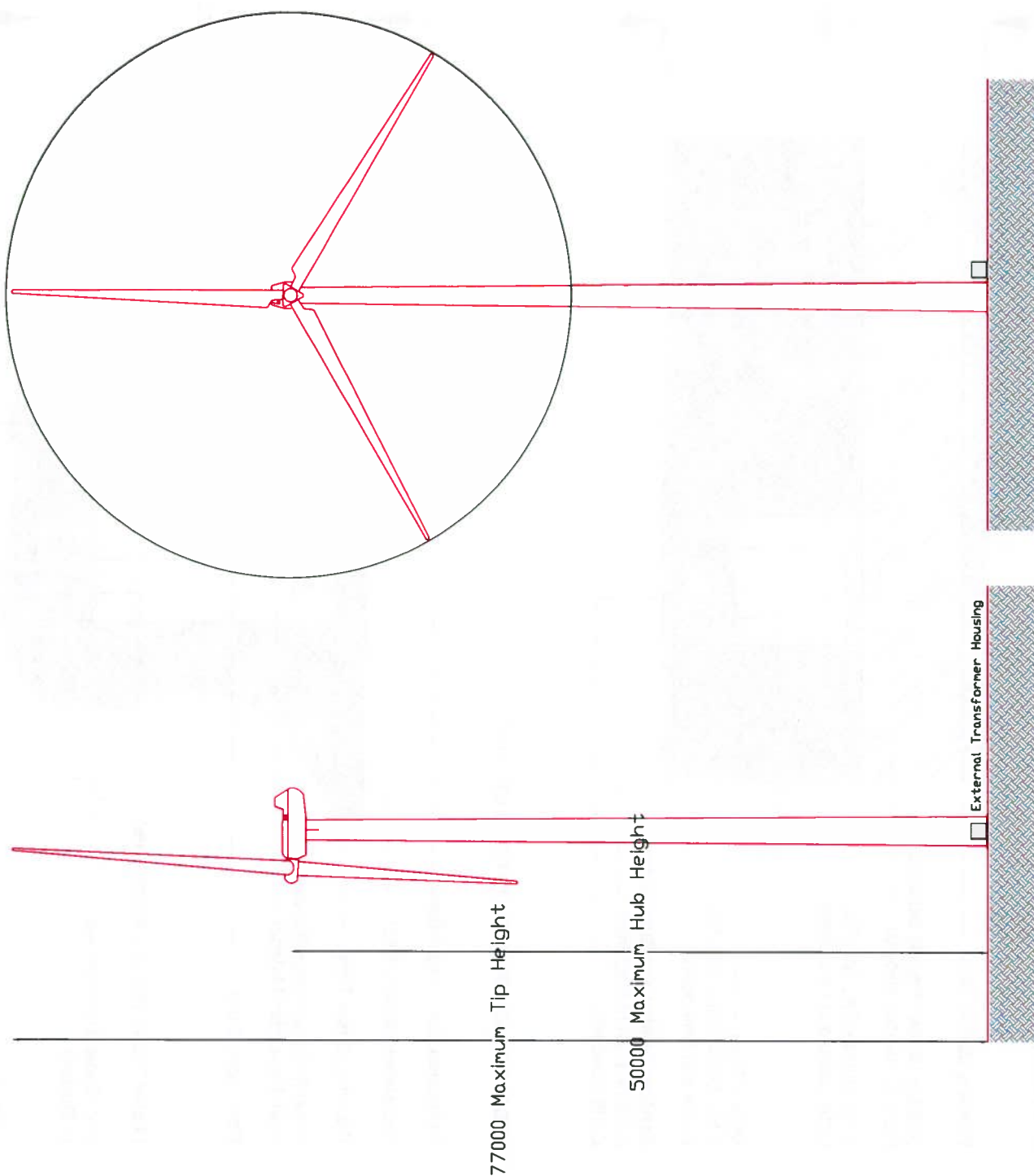
Client:
ClearWinds Ltd

By:
JN

App:
NF

Legend:

1. All dimensions in mm unless otherwise stated



Scale:

Approx 1:300 @ A3

Date: _____

21st November 2011

Project:

Drummick - Wind Turbine Proposal

Figure:

Figure 3: Typical WTG

Client:

ClearWinds Ltd

By:

 \sum

App:

FN



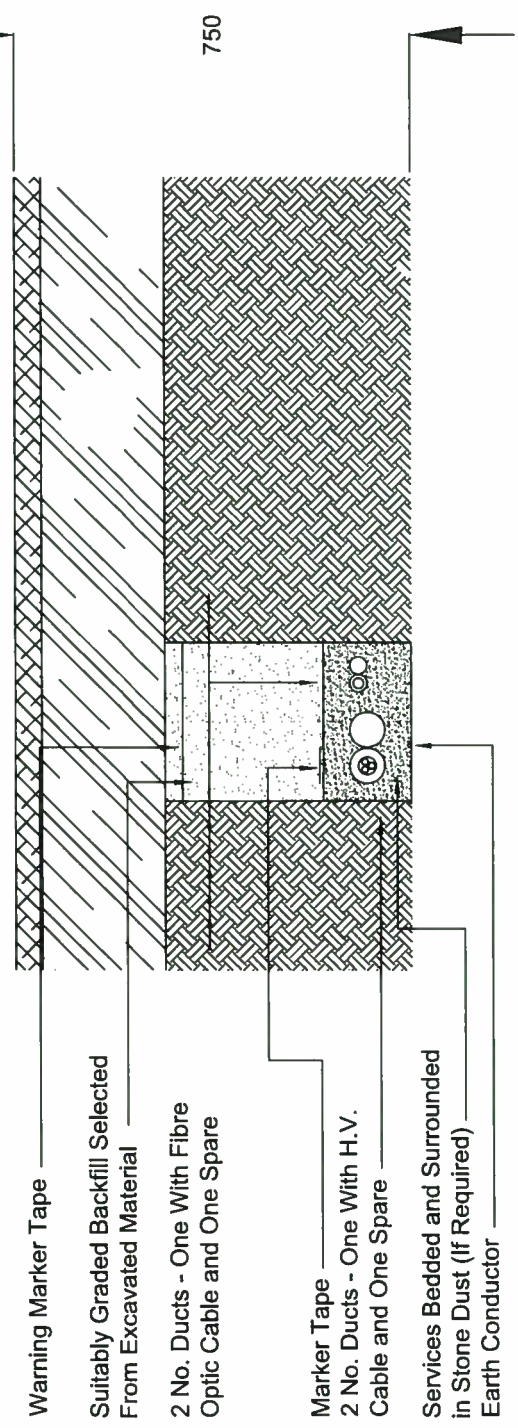
PMSS

Project Management Support Services

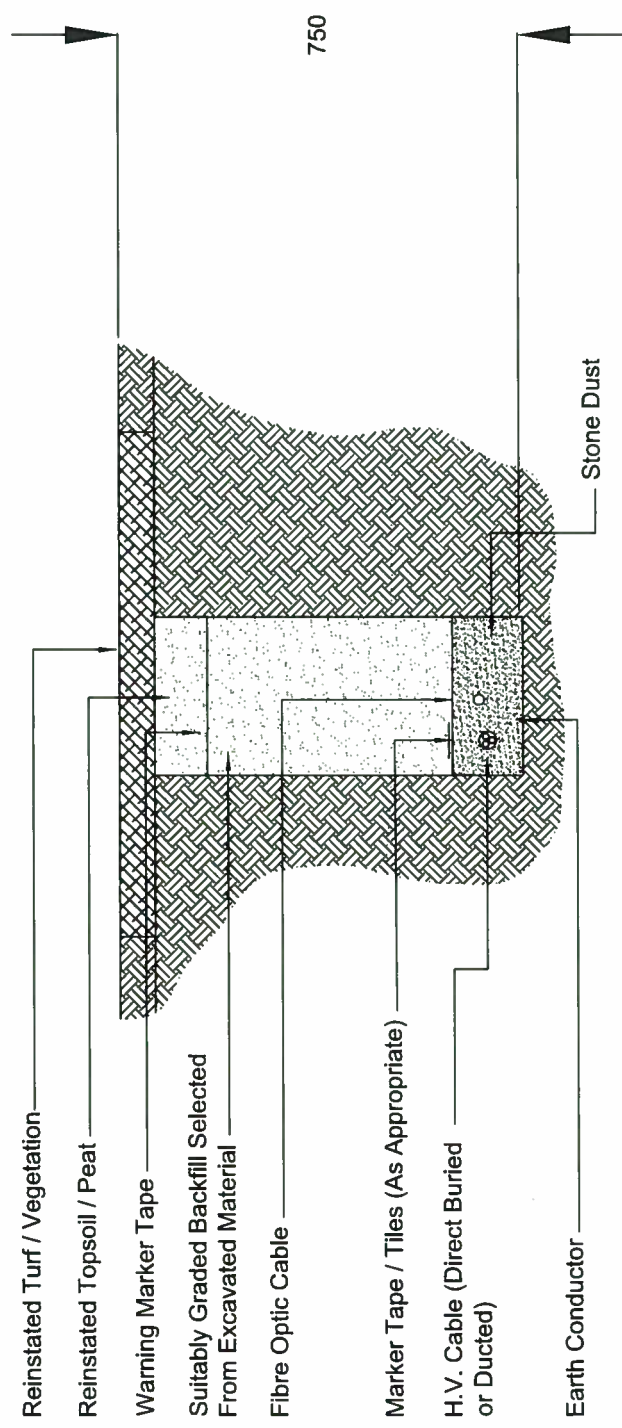
Legend:

1. All dimensions in mm unless otherwise stated

TYPICAL TRENCH SECTION CROSSING TRACK



TYPICAL TRENCH SECTION IN OPEN GROUND



Scale:
Various

Date:
21st November 2011

Project:
Drummick - Wind Turbine Proposal

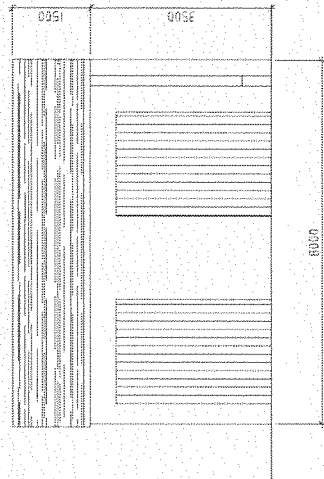
Figure:
Figure 4 : Typical Trench & Road Cross Sections

Client:
ClearWinds Ltd

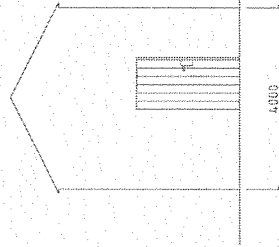
By: JN
App: NF

Legend:

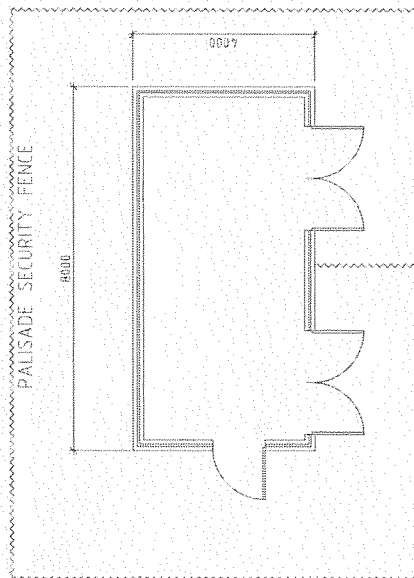
1. All dimensions in mm unless otherwise stated.
2. Foundation dimensions are to be confirmed depending on ground conditions and model of turbine.
3. Not for construction.



FRONT ELEVATION



SIDE ELEVATION



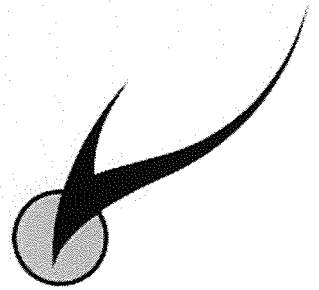
Revision Description	Rev	By	Date
Project			
Drumstick - Wind Turbine Proposal			
Client			
ClearWinds Ltd			
Drawing Title			
Figure 5. TYPICAL CONTROL BUILDING			
Project No.	Drawing No.	Revision	
29827	-	00	
Drawn	Designed	Checked	
JSN	JSN	SHC	
Scale @ A2 size	Date		
1:100	02/02/12		
Do not scale this drawing All dimensions to be confirmed on this drawing Contractor must check all dimensions on site prior to commencement of any work This drawing is copyright			



Broadwater House
Broadwater Road
Romsey
Hampshire
SO51 8GT

Tel: +44 (0)1794 526 560
Fax: +44 (0)1794 516 826
Email: enquiry@pmss.co.uk

PMSS Management Services Limited
Registered in England, No. 04416439
Registered Office Broadwater House Broadwater Road Romsey, Hampshire



Drummick, Perth

for Pegasus Planning Group on behalf of
Clearwinds Ltd

Report number: 11-PEG-004

Author: R Leigh

Date: December 2011

Approved: S Maslen

This report has been prepared for the Pegasus Planning Group in accordance with the terms and conditions of appointment for Extended Phase 1 Surveys [on request]. Avian Ecology Ltd (6839201) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

Extended Phase 1 Habitat Survey

CONTENTS

1	Summary.....	3
2	Introduction	5
	2.1. Background	5
	2.2. Legislative Framework	5
3	Methodology	7
	3.1. Desk Study.....	7
	3.2. Field Surveys	7
	3.3. Survey Limitations.....	7
4	Results	8
	4.1. Desk Study.....	8
	4.2. Field Survey	8
5	Discussion	13
	5.2. Statutory Designated Sites and Habitats	13
	5.3. Birds	13
	5.4. Bats.....	15
	5.5. Other species	17

REFERENCES

APPENDIX 1 : Phase 1 Habitat Survey Target Notes

FIGURE 1 : Phase 1 Habitat Survey Map

1 SUMMARY

- 1.1.1. This report presents the results of an Extended Phase I habitat survey of land at Drummick, near Glenalmond, Perth for Pegasus Planning Group on behalf of Clearwinds Ltd. The survey was commissioned in relation to a proposed wind turbine development.
- 1.1.2. The aims of the study were to assess the conservation value of the survey area, the likely presence of rare or protected and notable species, and to identify any features, habitats or species which would constitute potential constraints to the development.
- 1.1.3. An Extended Phase I habitat survey is an initial site walk-over that determines the baseline habitat of the study area, outlining the potential ecological value and significance of habitats for protected and notable flora and fauna. This was conducted on 18th May 2011 by Avian Ecology Ltd, and followed JNCC (2003) guidelines.
- 1.1.4. A desk-based study was undertaken in order to identify any nearby sites designated for nature conservation interest and potential features of ecological interest in the wider area. An overview of the relevant legislative framework is presented.
- 1.1.5. The survey covered all land within the landownership boundary where access permitted. The survey area contained a mixture of habitats, dominated by improved grassland with areas of poor semi-improved grassland, marshy grassland, rush pasture, rush heath and mixed, broadleaved and coniferous plantation woodland. Freshwater habitats were present in the form of scattered ponds, burns and drains. In the context of the proposed development, the turbine is situated in an area of rush pasture with tracts of broadleaved and coniferous plantation woodland nearby. A pond and drain network were also located in close proximity. The site is situated to the south of the River Almond in a wide u-shaped valley called Glen Almond, running approximately east-west. The wider landscape is dominated by a similar array of habitats within the valley floor and sides, merging into the upland habitats of the adjacent hills.
- 1.1.6. The results of the field survey and desk study demonstrate that the wider survey area supports some features of ecological value, although the turbine area is proposed within a mixture of habitats including improved grassland, poor semi-improved grassland, semi-improved acid grassland, inundation vegetation and ditches of relatively low ecological value.
- 1.1.7. The application site is not contained within a statutory designated site. The River Tay SAC is located 1.5km to the north of the site South Tayside SPA/RAMSAR site and Dupplin Lakes SSSI area located 9.7km to the south east of the site.
- 1.1.8. Detailed wintering and breeding bird surveys, including Vantage Point surveys have been carried out in order to demonstrate the potential for impacts on protected and notable bird species in the area.
- 1.1.9. The findings of these surveys are presented in separate report.
- 1.1.10. The potential for impacts on bats is low due to the location of the turbine in relation to bat friendly landscape features; however surveys have been undertaken and are presented in a separate report.

2 INTRODUCTION

2.1. BACKGROUND

2.1.1. Avian Ecology Ltd. was commissioned by Pegasus Planning Group on behalf of Clearwinds Ltd to undertake an Extended Phase I habitat survey at Drummick, near Glenalmond, Perth. The survey was commissioned in relation to a proposed wind turbine development. The proposed turbine lies at grid reference NN 953 268.

2.1.2. The objectives of the study were to;

- Provide baseline information on the current habitats and ecological features both on-site and in the immediate surrounding area;
- Identify the presence or potential presence of any protected species or habitats and provide an appraisal of any potential effects the proposed project may have on these, and,
- Identify the proximity of any sites designated for nature conservation interest and provide an appraisal of any potential effects the proposed project may have on these;

2.1.3. The study comprised a field survey, in combination with a desk based review of existing data and available online resources.

2.2. LEGISLATIVE FRAMEWORK

2.2.1. Protected species are referred to in Scottish Planning Policy (Subject Policies), paragraphs 142 to 145, with a general reference to certain plants, animals and wild birds all being protected under the Wildlife and Countryside Act 1981 (as amended). The Act emphasises that, regardless of any planning policy or guidelines, certain species are legally protected and any type of development that would injure, kill, ill treat, intentionally damage or destroy any protected species or place of shelter would be a criminal act. Species of European importance receive additional protection under the Conservation (Natural Habitats &c) Regulations (1994), as amended in Scotland (the 'Habitats Regulations') and others receive protection through specific legislation (e.g. the Protection of Badgers Act, 1992 as amended).

2.2.2. The Nature Conservation (Scotland) Act 2004 places a duty on every public body to further the conservation of biodiversity consistent with the proper exercise of their functions; it requires Scottish Ministers to designate one or more strategies for the conservation of biodiversity as the Scottish Biodiversity Strategy, and to publish lists of species of flora and fauna and habitats of principal importance.

2.2.3. In 2007, the list of species and habitats of principal importance was fully revised taking into account emerging priorities, conservation successes, and information gathered in the past decade. The revised list contains 1150 species and 65 habitats that have been listed as priorities for conservation action under the UK Biodiversity Action Plan (UKBAP). The framework for conserving biodiversity is laid out in a 'Conserving Biodiversity - The UK Approach' (Defra,2007).

2.2.4. As part of the action plan process, Local Biodiversity Action Plans (LBAPs) were also produced for every county in the UK, although other public bodies may also produce

them. These LBAPs highlight local biodiversity issues, with specific action plans being implemented for priority habitats and species where they occur. The relevant scheme for the proposed development is the Tayside Biodiversity Action Plan. A total of 89 priority species have been identified for the Tayside region as well as 6 broad habitats.

- 2.2.5. Any development which may have an impact upon the integrity of a statutory designated site for nature conservation purposes is also subject to the terms of the Wildlife and Countryside Act 1981 (as amended) and the Habitat Regulations, where an Appropriate Assessment may be required in order for a competent Authority to determine this impact, both from the proposed scheme and in combination with any other schemes.
- 2.2.6. With these legal responsibilities and planning implications, it is important that any ecological assessment of a proposed development site addresses both the possibility of protected species being present within the site and the potential impacts of the proposed scheme on statutory designated sites for nature conservation. Without such an assessment, a developer is unable to demonstrate due diligence in its responsibilities, with reference to both the legal protection and the possible information required in support of the planning application. It would, however, be unreasonable for an ecological assessment to survey for every protected species. Any such assessment should therefore be based upon the results of a habitat appraisal and the associated possibility or likelihood of protected species being present. This study therefore seeks to establish the potential for protected species to occur within the proposal site and to identify any potential impacts of the proposed scheme on statutory sites designated for nature conservation purposes.

3 METHODOLOGY

3.1. DESK STUDY

- 3.1.1. The desk study identified statutorily designated sites of nature conservation interest within 5km of the proposal site through a review of the Scottish Natural Heritage Information Service (SNHi) website.
- 3.1.2. Reference was also made to Ordnance Survey maps of the wider area and online aerial images (www.google.co.uk/maps), in order to determine any features of nature conservation interest in the wider area.
- 3.1.3. Biological data was sought from Leisure and Culture Dundee and Perth Museum Biological Records Centre, however, these organisations were unable to provide a comprehensive records search covering the application area. The records search therefore concentrated on those records available on the National Biodiversity Network (NBN) Gateway.
- 3.1.4. The search area for consultation was a minimum 3km radius from the turbine location for all protected species and / or species listed under the Biodiversity Action Plan (BAP), at either a national or local level. In addition, data was requested for bat and bird records within 5km and noctule *Nyctalus noctula* bat records within 10km.

3.2. FIELD SURVEYS

- 3.2.1. The field survey was undertaken on 18th May 2011 by Andrew Logan MIEEM. The extent of the survey area incorporates all accessible land within the landownership boundary and immediately adjacent land as detailed in **Figure 1**.

Extended Phase I Habitat Survey

- 3.2.2. The methodology employed was based-upon that outlined in the 'Handbook for *Phase 1 Habitat Survey*' (JNCC, 2003) whereby all habitats within the study area are mapped and described using a series of 'target notes' to provide an overview of the site and its potential to harbour notable or protected species.
- 3.2.3. The table of target notes is presented in Appendix 1 of this report and should be read in conjunction with the phase one habitat map (figure 1).
- 3.2.4. The survey area consisted of all land within the landownership boundary and immediately adjacent land where this could be viewed from within the landownership boundary or from public access areas. Binoculars were used where necessary. Note that the survey boundary differs slightly from the landownership boundary in that it includes two tracts of woodland not forming part of the latter.

3.3. SURVEY LIMITATIONS

- 3.3.1. Access was only available for habitats within the land ownership boundary and therefore habitats outside of this were not subject to a full habitat survey, although broad habitat types were recorded where possible.
- 3.3.2. The survey was also conducted in heavy rain which reduced visibility at some points during the survey, however this was not considered to be a significant constraint.

4 RESULTS

4.1. DESK STUDY

Statutory Designated Sites

- 4.1.1. A search was made for all statutory designated sites within a 5km radius of the study area using the SNHi website. This was extended to 10km for all sites with mobile interest features, such as birds and bats.

Site Name	Distance (km)	Description	Status
River Tay	1.5km N	Qualifying interest features: river lamprey <i>Lampetra fluviatilis</i> , brook lamprey <i>Lampetra planeri</i> , otter <i>Lutra lutra</i> , sea lamprey, atlantic salmon <i>salmo salar</i> , oligotrophic to mesotrophic standing waters.	SAC
South Tayside Goose Roosts	9.7km SE	Qualifying interest features: Aggregations of non-breeding birds: Pink-footed goose <i>Anser brachyrhynchus</i> (SPA and Ramsar feature) Greylag goose <i>Anser anser</i> (SPA and Ramsar feature) Waterfowl assemblage (SPA feature only)	SPA and Ramsar site
Dupplin Lakes	9.7km SE	Underlies and extends beyond the boundary of the South Tayside Goose Roosts SPA and Ramsar site. Qualifying interest features: Aggregations of non-breeding birds: Pink footed goose Assemblages of breeding birds: Breeding bird assemblage	SSSI

Table 4.1: Statutory designated sites within 5km of the turbine location, extended to 10km for sites with bird or bat interest. SSSI: Site of Special Scientific Interest, SPA: Special Protection Area, SAC: Special Area of Conservation, Ramsar site- wetland of international importance.

- 4.1.2. No non-statutory Scottish Wildlife Trust reserves were located within 2km of the proposed turbine location.

4.2. FIELD SURVEY

- 4.2.1. A Phase I habitat map is presented in **Figure 1**. Accompanying target notes (TNs) and a summary of habitats and species considered pertinent to the project are presented in Appendix 1 and paragraphs 4.2.2 to 4.2.30 respectively. Information on the legal implications of the presence of such habitats and/or species is discussed in Section 5 where appropriate, along with an assessment of possible impacts on these features.

Habitats

- 4.2.2. The survey area occupies approximately 126 ha and is dominated by improved grassland. Approximately one third of the site is given over to poor semi-improved grassland. The latter is overlain with scattered patches of rush *Juncus spp.* and resembles rush pasture. In one section of the site this has graded into marshy grassland.
- 4.2.3. Areas of mixed, broadleaved and coniferous plantation woodland and rush heath are present just outside of the landownership boundary, although a small section of mixed plantation woodland and coniferous plantation woodland falls within the survey boundary.
- 4.2.4. Freshwater habitats were present within the landownership boundary in the form of a pond and several drains. Further drains, burns and an additional pond lie just outside the landownership boundary.
- 4.2.5. Field boundaries consist largely of post and wire fences, although stone walls and intact and defunct species poor hedgerows are also present occasionally. Scattered scrub and coniferous and broadleaved trees are present around the fringes of the landownership boundary.
- 4.2.6. The turbine is to be sited within an area of semi-improved grassland (rush pasture). Other habitats present within 250m include a section of dry ditch approximately 44m to the south of the turbine, with a further ditch located 180m south; a stand of coniferous plantation woodland lies approximately 130m to the south-west and broadleaved plantation woodland approximately 80m to the south-east. An area of marshy grassland lies 125m to the east. All field boundaries within 250m consist of post and wire fences, with the exception of one short section of stone wall on the north-eastern boundary.
- 4.2.7. Table 4.2 details the main habitat types within the survey boundary.

JNCC Habitat Code	Habitat Name	Area (total study area 126 ha)	% cover of study area.
A1.3.2	Mixed plantation woodland	0.84	0.67%
A1.2.2	Coniferous plantation woodland	2.25	1.79%
B.4	Improved grassland	73.88	58.63%
B.5	Marshy grassland	1.69	1.34%
B.6	Poor semi-improved grassland (rush pasture)	45.50	35.87%
J4/J3.6	Roads, hardstanding and buildings	1.8	1.43%
G1	Standing water (pond)	0.04	0.03%
A2.2	Scattered scrub	Negligible	Negligible

Table 4.2: Main habitat types identified within the survey area.

- 4.2.8. No evidence of notable or protected species was recorded during the site visit.

Protected Species Including Records from Desk Study

- 4.2.9. The application site and adjacent land is potentially suitable for a range of protected species and the wider area offers some possible foraging and roosting habitat for bats and birds, as described below.
- 4.2.10. Comments on protected species are informed by data from the NBN Gateway.

Birds

- 4.2.11. The site is likely to support a suite of breeding birds typical of the habitats and region and this may include some scarce or protected species.
- 4.2.12. The NBN Gateway identified several species considered potentially vulnerable to wind turbine developments (following SNH 2006 guidance) within the 10km square covering the site. These were; whooper swan *Cygnus cygnus*, greylag goose *Anser anser*, pink-footed goose *Anser brachyrhynchus*, barnacle goose *Branta leucopsis*, osprey *Pandion halietus*, peregrine falcon *Falco peregrinus*, black grouse *Tetrao tetrix*, golden plover *Pluvialis apricaria*, curlew *Numenius arquata*, short-eared owl *Asio flammeus*, Scottish crossbill (records for *Loxia* spp. only) and capercaillie *Tetrao urogallus*.
- 4.2.13. There were also records of numerous other common woodland and farmland species on the NBN Gateway database and records of barn owl *Tyto alba* approximately 2-3km SE of the proposed turbine.
- 4.2.14. The woodland habitats and hedgerows present on site have the potential to be used by nesting birds in the breeding season.

Bats

- 4.2.15. The site offers some opportunities for foraging and commuting bats in the form of woodland edges, hedgerows, dry stone walls, ditches, ponds and marshy grassland habitats. Few potential roost opportunities were identified, although scattered mature broadleaved trees were present on occasion and some of these appeared to provide limited roost potential. More specifically the proposed turbine location is over 50m from any bat friendly feature and therefore adhering to the Natural England TIN059 Bats and Single Wind Turbines Guidance.
- 4.2.16. All buildings were located over 500m from the proposed turbine. They were not connected to the turbine by any prominent linear habitat features. The buildings at Drummick consisted of several prefabricated barn structures considered to offer limited roost potential and a series of residential farm buildings with low to medium roost potential. The buildings at Sluidubh fell outside of the survey area, but appeared to consist of a modern recently constructed residential property with negligible roost potential and an older residential building with low to medium roost potential. A full bat roost assessment was not carried out on these buildings as part of the Phase 1 survey.
- 4.2.17. A search for bat records within the 10km grid square NN92 covering the site was carried out through the NBN gateway. Records for 4 species of bat were returned as well as 3 more general records. Table 4.3 below summarises those records.

Species	Nearest record	Comments
Brown long-eared bat <i>Plecotus auritus</i>	Three records. Nearest record at Keilour approximately 1.5km SW. Also River Almond to the north-west and Loch Meallbrodden to the west.	Records to 1km accuracy.
Common pipistrelle <i>Pipistrellus pipistrellus</i>	4 records. Closest record 2km to SE, south of Keilour.	Records to 1km accuracy.
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	2 records both relating to the River Almond. Closest record approximately 1km north.	Records to 1km accuracy.
Daubenton's bat <i>Myotis daubentonii</i>	1 record for 10km square covering the site.	Records to 10km accuracy.
Pipistrelle <i>Pipistrellus pipistrellus sensu lato</i>	1 100m record for Fowlis Wester approximately 3km SW. 1 record covering the whole 10km square.	Records to 100m and 10km accuracy.
Pipistrelle species <i>Pipistrellus spp.</i>	7 records – 2 x Fowlis Wester, 2 x Keilour, 2 x River Almond and 1 x Cowgask Burn. Closest record approximately 1.5km SE at Keilour.	Records to 1km accuracy.
Chiroptera (general bat records)	4 records – nearest record Keilour.	Records to 1km accuracy.

Table 4.3: NBN gateway records within grid square NN92.

4.2.18. This region of Scotland is not known to support important bat populations and this is reflected in the limited number of species identified through desk study.

4.2.19. Due to the geographical location of the site, the habitats present are likely to support only commoner bat species which are tolerant of the exposed environmental conditions typical of this area.

Badgers

4.2.20. The habitats on site, including the woodlands and hedgerows are typical of that used by badgers, although the presence of rush pasture and marshy grassland areas suggests that the water table is near the ground surface across much of the site. This reduces the potential for sett construction. No activity was found within at least 50 metres of the turbine location and no badger setts were found within the survey area (although it is noted that this did not constitute a full badger survey).

4.2.21. NBN Gateway did not return any records for the 10km grid square NN92 covering the site.

Amphibians

4.2.22. There are two ponds present within the survey area and a series of ditches. These appeared to be of insufficient depth or permanence to be suitable as great crested newt breeding ponds, as evidenced by the presence of emergent terrestrial grasses. They were largely devoid of suitable egg laying vegetation. However, the habitat could be used by commoner amphibian species. Palmate newt *Lissotriton helveticus*

and common frog *Rana temporaria* were recorded within the 10km square (NN92) covering the site. No records of great crested newt were received from the NBN gateway within the 10km square. The closest record on NBN gateway is located over 10km away.

Otter

- 4.2.23. Five records were received from the NBN Gateway database. One of these records related to the whole 10km square. The remaining four records were accurate to 100m with the nearest approximately 3km north-west of the proposed turbine on the River Almond. Another record related to a tributary of the River Almond, approximately 5km to the north-east. The remaining records were for Cowgask Burn and Pow Water to the south.
- 4.2.24. The ditches present within the survey area were narrow and shallow, and often grazed to the edges, offering no suitable cover for holt construction and are considered unlikely to support this species.

Reptiles

- 4.2.25. No evidence of reptiles was encountered during the survey, but suitable reptile habitat is present within the study area in the form of heathland, marshy grassland and patches of tussocky grassland bordering these habitats.
- 4.2.26. Records of common lizard *Zootoca vivipara* and slow worm *Anguis fragilis* were returned for grid square NN92. Both records related to the whole 10km square.

Red Squirrel

- 4.2.27. Several red squirrel *Sciurus vulgaris* records were returned for the 10km grid square covering the site. The closest records (6 no.) relate to the coniferous woodland immediately to the south-west of the site and a series of records along the A85 corridor to the north.
- 4.2.28. Suitable habitat lies within the coniferous woodland present throughout the survey area. The closest area of woodland is located approximately 80m to the south-east of the turbine, however this is a relatively small tract. The woodland with the known red squirrel records, Gorthy Wood, is located 130m to the south-west of the turbine at the closest point.

Invertebrates

- 4.2.29. The habitats present within the survey area offer a range of microhabitats including heathland, grassland and marsh habitats and gradations between these. The survey area therefore has the potential to support a range of invertebrate species. The immediate turbine location consists almost entirely of rush pasture, offering lower diversity and therefore reduced opportunities for invertebrates.

Other Species

- 4.2.30. Records of brown hare *Lepus europaeus* and mountain hare *Lepus timidus* were returned for the 10km square covering the site, with records for both within 3km of the site. However, records were all over 25 years old and are unlikely to reflect current distribution.

5 DISCUSSION

- 5.1.1. Wind turbine developments typically require only a small amount of land-take. Key impacts are therefore generally restricted to those on designated sites (particularly mobile interest features), habitats, birds and bats. Impacts on other species may occur, but can generally be avoided through sensitive design and/or construction method statements. The discussion here therefore concentrates on potential key impacts.

5.2. STATUTORY DESIGNATED SITES AND HABITATS

- 5.2.1. The nearest designated site to the proposed turbine is the River Tay. This is located over 1.5km to the north of the site and will not be directly impacted by the proposed works. The nearest designated site with mobile interest features is the South Tayside Goose Roosts SPA and Ramsar site, located 9.7km south-east of the site and Dupplin Lakes SSSI which underlies part of this site. Interest species for the SPA include pink-footed goose, greylag goose and waterfowl interest. Interest species for the Ramsar site are the same, excluding the waterfowl interest. Pink-footed goose is also a qualifying interest species of the SSSI as well as breeding bird assemblage. Pink-footed goose and greylag goose have been recorded within the 10km square covering the application site. The potential for the project to impact upon these species is discussed further under birds section, below (section 5.3).
- 5.2.2. The survey area was dominated by improved grassland, with approximately one third of the habitat area given over to poor semi-improved grassland (rush pasture). Other habitats present included marshy grassland, and freshwater habitats in the form of ponds and ditches. Large areas of plantation woodland (mixed, coniferous and broadleaved), were present just outside the landownership boundary to the south, along with a small area of heathland.
- 5.2.3. The turbine is to be sited within an area of rush pasture and this is the main habitat type within 80m of the turbine. Areas of coniferous plantation woodland are located beyond this to the south-east and south-west, along with an area of marshy grassland to the east. A temporary pond has formed at the end of a largely dry, shallow ditch located approximately 40m from the turbine at the closest point.
- 5.2.4. Access to the turbine for construction and operation will be from an existing access track and therefore only a small section of rush pasture will be lost to allow construction of an access track and installation of the turbine base. A temporary construction compound will also be sited near to this area. Loss of a small section of this habitat is not considered significant as it is common within the local area and typical of this part of Scotland. Impact of this removal on individual protected species is considered further below.

5.3. BIRDS

- 5.3.1. All wild birds, their nests and eggs are, with few exceptions, protected under the Wildlife and Countryside Act 1981 (as amended in Scotland). Over eighty species or groups of species are listed under Schedule 1 of the Act, which confers special protection with increased penalties for offences committed. Additional protection is provided to species listed under Annex I of the EC Council Directive on the Conservation of Wild Birds 79/409/EEC (the 'Birds Directive') as amended. In addition, following recent revisions, fifty-nine species are now listed on the UKBAP.

- 5.3.2. The proposal site is located within a low/unknown sensitivity area as set out within the RSPB Bird Sensitivity Map Bright *et al.* (2006), but close to areas of high sensitivity. Sensitive species representing qualifying interests of the South Tayside Goose Roosts SPA and Ramsar site and the underlying Dupplin Lakes SSSI have been recorded within the 10km square covering the site. In addition, records for 12 species considered potentially at risk from wind farm developments were returned for the 10km square covering the site.
- 5.3.3. The site and surrounding landscape is therefore likely to support a suite of species which may include the qualifying interest species of these designated sites, in particular pink-footed goose and greylag goose. The proximity of the site to upland habitats could also bring rarer raptors and upland waders close to the site. The large tracts of coniferous woodland to the south of the turbine could also support a range of species including black grouse and goshawk.
- 5.3.4. The potential impacts of wind turbines on birds fall broadly into two categories; collision risk and displacement. The risks to individual species vary depending on ecology and behaviour and some species are widely classified as more vulnerable than others, particularly scarcer raptors, upland waders and significant concentrations of waterfowl (Percival, 2005).
- 5.3.5. The wider area around Drummick is known to support a number of these potentially vulnerable species. Whilst the proposal site itself is unlikely to support many of these species due to habitat preferences, it is possible that some are present at least occasionally, or pass over the area whilst commuting between favoured foraging sites.
- 5.3.6. The primary ornithological value of the area is its potential to support passage and wintering waterfowl associated with the South Tayside Goose Roosts SPA and corresponding statutory designations. Field surveys were therefore designed to determine the usage of the site by those species which represent qualifying interests of these designations, along with other protected and notable species.
- 5.3.7. Detailed wintering and breeding bird surveys, including Vantage Points (VPs) black grouse survey and breeding raptor surveys have been undertaken, these are required in order to demonstrate the impacts of the proposed development on these species in accordance with legislation (in particular the Habitats Regulations). The full outputs from these surveys are provided within the separate ornithological report Ref 11-PEG-003.
- 5.3.8. Vantage Point Surveys are ongoing; these surveys have been undertaken throughout the year, with the primary aim of assessing the use of the site by specific target species mainly wildfowl, wader and the scarcer raptor species.
- 5.3.9. Early indications from the surveys show that the vantage point surveys recorded four pink footed geese flights over the site, and it was noted a number of lapwing and curlew nest on the wider site, the impact on these species will require further assessment, and will be presented within the ornithological report.
- 5.3.10. During the black grouse surveys a number of leks were recorded in the surrounding area, however the separation distance from the proposed turbine location to the leks should minimise any impacts, a further detailed assessment of the findings are presented within the ornithological report.

- 5.3.11. The raptor survey recorded a goshawk nest in the woodland within the wider area; a detailed assessment of the impact of the scheme on nesting goshawk will be contained within the ornithological report.

5.4. BATS

- 5.4.1. Bats are European Protected Species and listed in Annex IV of the European Habitats Directive. As such, they receive protection in Scotland under the Conservation (Natural Habitats, &c.) Regulations (1994) (as amended), in addition to protection under the Wildlife and Countryside Act 1981 (as amended in Scotland).
- 5.4.2. If bats are present on a development site and, as a result of the development there is a likelihood that a roost may be damaged or destroyed, or where there is considered to be a reasonable possibility that bats occupying a roost may be significantly disturbed, or where there would be a requirement to significantly disturb a bat irrespective of its location, the development can only proceed if a European Protected Species (EPS) license is issued by SNH.
- 5.4.3. Two possible mechanisms have been identified whereby operational wind farms may impact on bats;
- Ultrasound emission by turbines, and;
 - Death or injury through interaction with turbines, either through collision or the effects of rapid changes in air pressure (barotraumas).
- 5.4.4. Generic guidance on assessing the impact of wind turbines on bats has been developed at the European level under the EUROBATS Agreement (Bonn Convention), to which the UK is a signatory. Betts (2006) includes an assessment of collision risk based on the foraging strategy of different UK bat species and this was refined in Natural England 2009 guidance (TIN051), with additional NE guidance on bats and single wind turbines also issued in 2009 (TIN059). The Natural England guidance, adopted in Scotland by SNH, highlights the current lack of information and goes on to make basic recommendations for avoidance of important bat areas and landscape features typically used by bats. More recently (June 2011), the Bat Conservation Trust issued specific guidance on surveying wind farms for bats.
- 5.4.5. In respect to the current development, the NE bats and single wind farms guidance (TIN059) is considered most appropriate in terms of impacts assessment.
- 5.4.6. TIN059 states that *'a bat survey should normally be recommended for applications for turbines that will be located within 50m of the following features:*
- *buildings or other features or structures that provide potential as bat roosts, including bridges, mines etc;*
 - *woodland;*
 - *hedgerows;*
 - *rivers or lakes; and*

- *within or adjacent to a site designated for bats (SSSI or SAC) (but please note more extensive work will be required at such sites than is recommended in this document).'*
- 5.4.7. The proposal site is not within or adjacent to a known important bat area. The location of the site and general surrounding habitats are unlikely to support important bat populations, but it is likely that commoner species are present.
 - 5.4.8. The proposed turbine application site is depicted in Figure 1. Bat activity is strongly affiliated with habitat features. Activity has been shown to decline when measured at fixed intervals up to 50m away from tree lines and at varying intervals up to 35m from tree lines. This decline occurs both when bats are commuting and when foraging, although the decline is greatest when animals are commuting. Monitoring in Scotland has shown that bats in mixed farmland prefer to remain close to habitat features when commuting (Natural England, TIN051 2009).
 - 5.4.9. The proposal site is set in open habitat designed so, in order to maximise the wind supply, it is widely accepted that bats do not tend to have a preference for open habitats due to the exposure to inclement weather such as wind and rain, both of which affects the presence of avian invertebrates.
 - 5.4.10. A series of surveys were undertaken, comprising transect activity surveys and fixed monitoring surveys located on the proposal location.
 - 5.4.11. The full results are presented in report 11-PEG-002 summarised below.
 - 5.4.12. Bat activity levels were much lower during the September surveys comparative to July and August. This may result from this month being relatively late in the bat survey season; however bat activity will also be strongly influenced by transient factors such as weather conditions, especially considering that monitoring only took place over 2 to 3 nights on each month.
 - 5.4.13. 84% of bat activity was recorded at 1.5m above ground level, whereas 10.1% was recorded by the microphone at 10m high. This suggests that the recorded bat activity was predominantly close to ground level; however as the mast was only 10m high, there is the possibility that calls emitted by high-flying bats were not registered on either microphone.
 - 5.4.14. During the static monitoring surveys all registered bat activity was associated with bat species considered at low risk at the population level in the context of this development (Natural England Guidance TIN051 (2009)).
 - 5.4.15. No bat roosts were identified within 500m of the proposed turbine.
 - 5.4.16. The proposed turbine location is more than 50m from the nearest important bat habitat feature (coniferous plantation woodland) and therefore conforms with to Natural England Guidance TIN059 (2009).
 - 5.4.17. The site is considered to be of low importance for bats, with low to moderate activity levels attributed to relatively common UK species.
 - 5.4.18. Activity is highly clustered around specific bat habitat features, such as the edge of the coniferous woodland at Gorthy Wood, which is likely to provide a foraging and

commuting corridor of moderate local importance for bats; however the proposed development is not anticipated to impact upon these areas.

- 5.4.19. No constraints relating to bats are foreseen in relation to the proposed single wind turbine development.

5.5. OTHER SPECIES

- 5.5.1. No impacts on badgers are anticipated as no setts were identified within at least 50m of the proposed turbine location; however, given there are records in the wider area, a pre-construction badger survey is recommended to ensure that no new setts are constructed within 50m of the proposed working areas in the interim period.
- 5.5.2. Reptiles and amphibians are not considered likely to be affected by the proposed development once operational, although a Construction Method Statement may be required in order to minimise risks to reptiles during construction.
- 5.5.3. No other impacts are anticipated and no further surveys are considered necessary.

REFERENCES

Bat Conservation Trust (2011), Bat Surveys – Good Practice Guidelines 2nd Edition: Surveying for onshore wind farms. BCT, London.

Defra (2007). Conserving Biodiversity – The UK Approach. HMSO.

Drewitt, A.L. (1999). Wind Farms and Birds. English Nature information note.

Drewitt A.L. & Langston, R.H.W. (2006). Assessing the Impacts of Wind Farms on Birds. Ibis 148: 29-42.

Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993) The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991. T. & A.D. Poyser, London.

Lack, P.C. (1986) The Atlas of Wintering Birds in Britain and Ireland. T. & A.D. Poyser, London.

Langston, R.H.W. & Pullan, J.D. (2003) Effects of Wind farms on Birds. Report by Birdlife International on behalf of the Bern Convention. Sandy, UK: RSPB.

Natural England Technical Information Note TIN051 (2009) 'Bats and onshore wind turbines: Interim guidance'. Natural England.

Natural England Technical Information Note TIN059 (2009), 'Bats and single large wind turbines: Joint Agencies Interim Guidance'. Joint Agencies Publication.

Natural England Technical Information Note TIN069 (2010) 'Assessing the effects of onshore wind farms on birds'. Natural England.

Percival, S.M. (2005) Birds and wind farms: what are the real issues? British Birds 98: 194-204

Pearce-Higgins, J.W., Stephen, L., Langston, R.H.W., Bainbridge, I.P. and Bullman, R. 2009. The distribution of breeding birds around upland wind farms. Journal of Applied Ecology 46: 1323-1331.

SNH - River Tay Special Area of Conservation (SAC Citation)

SNH - Metven Moss Special Area of Conservation (SAC Citation)

SNH- Connach Marsh Site of Special Scientific Interest (SSSI)

SNH-Dupplin Lakes Site of Special Scientific Interest (SSSI)

Steinborn, H & Reichenbach, M (2011). The role of wind turbines in the context of habitat quality – the case of Lapwing (*Vanellus vanellus*), Skylark (*Alauda arvensis*) and Meadow pipit (*Anthus pratensis*) in a cultivated raised bog in northern Germany. Available online at http://cww2011.nina.no/Portals/cww2011/DynamicForms_Uploads/25a280ac-0390-4405-a5a8-4c1cff681760.pdf

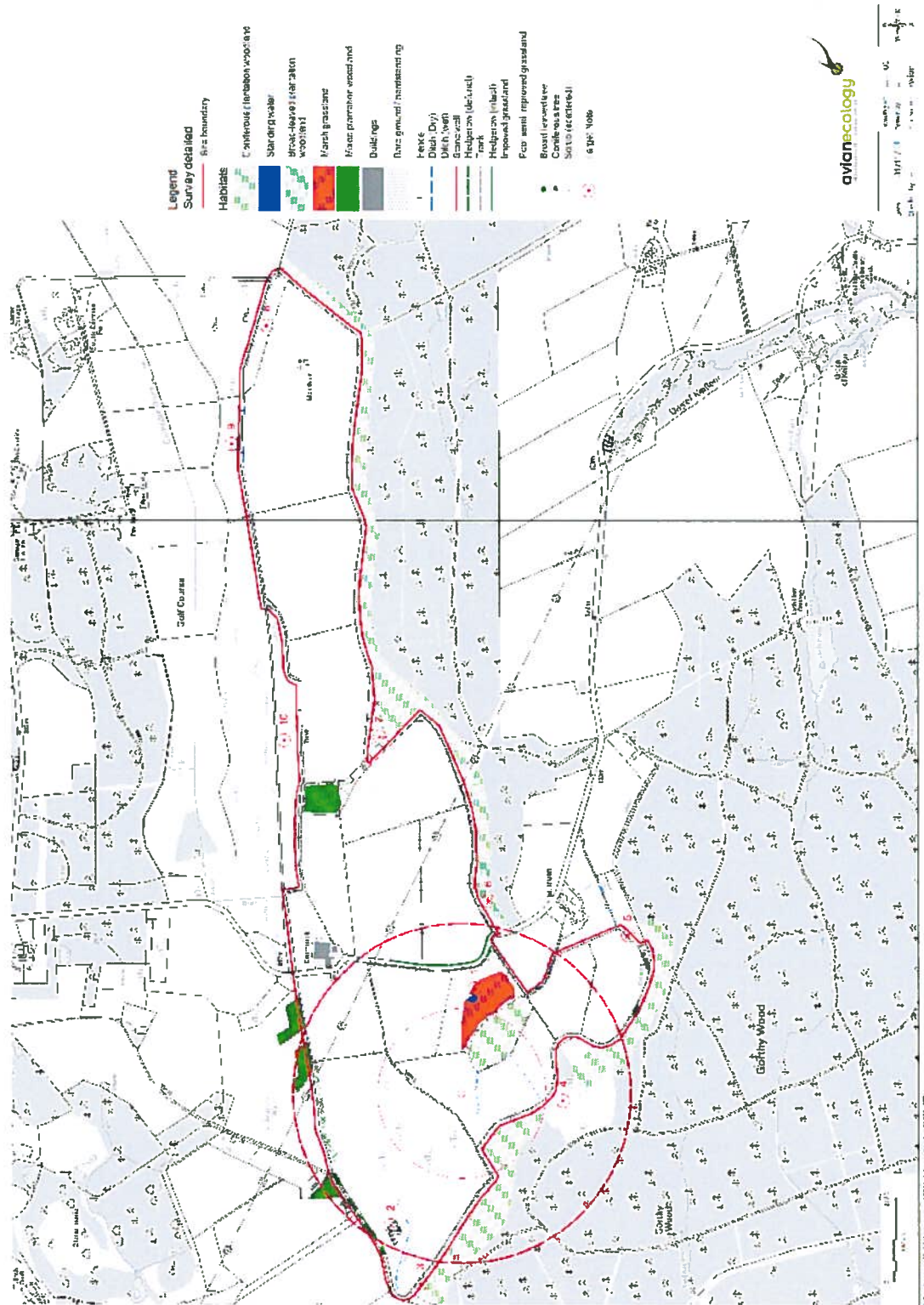
<http://www.snh.gov.uk/about-scotlands-nature/species/species-sightings-in-your-area/>

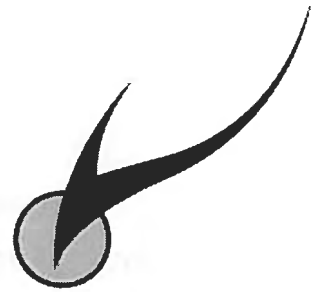
APPENDIX 1 : PHASE 1 HABITAT SURVEY TARGET NOTES

Target Note	Description
1	Large area of marshy grassland with rush <i>Juncus sp</i> the dominant species. A shallow pool of standing water was present in the centre fed by a drainage inlet to the north of the pool.
2	Stone outcrop, possible former industrial use. Scattered gorse <i>Ulex sp.</i>
3	Recently cleared are of coniferous plantation with young broad-leaved tree (birch <i>Betula pendula</i> and willow <i>salix sp.</i>) regrowth.
4	Small opening on the edge of coniferous plantation area dominated by heather <i>Calluna</i> .
5	Shallow ditch along boundary with rock substrate, feeds ponds located on neighbouring land.
6	Recently cleared are of coniferous plantation with some young broad-leaved tree (birch) regrowth.
7	Fenced off area, ground flora includes heather, with scattered willow and gorse scrub. Areas had recently been planted with birch and coniferous tree (3-6m in height). Vegetation grades back to mature coniferous plantation adjacent to the site.
8	Fences off section on field that had been cut and comprised stubble at time of survey. Along site boundary scattered gorse scrub was present.
9	Area of wet marshy grassland and pools.
10	Relatively extensive area of heathland immediately adjacent site.

FIGURE 1 : PHASE 1 HABITAT SURVEY MAP







Drummick

for Pegasus Planning Group Ltd on behalf
of Clearwinds Ltd.

Report number: 1-PEG-004-02

Author: S Whiteley

Date: 27th January 2012

Approved: R Leigh

This report has been prepared for Pegasus Planning Group. in accordance with the terms and conditions of appointment for Ornithology Surveys. Avian Ecology Ltd (6839201) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

Ornithology Surveys 2011

CONTENTS

1	Introduction	3
2	Methodologies	3
3	Results	7
4	Site Evaluation	16

Annex 1: Vantage Point Survey Effort and Conditions

Annex 2: Survey Results

Annex 3: Collision Risk Model

Figure 1: Survey Area

Figure 2: All Target Wader and Wildfowl Flights

Figure 3: All Collision Risk Target Wader and Wildfowl Flights

Figure 4: All Target Raptor Flights

Figure 5: All Collision Risk Target Raptor Flights

Figure 6: Black Grouse and Breeding Raptor Survey Area's and Results

Figure 7: Location of South Tayside Goose Roosts SPA

1 INTRODUCTION

1.1. OVERVIEW

- 1.1.1. This report details an ornithological appraisal undertaken for Pegasus Planning Group Ltd. on behalf of Clearwinds Ltd. in relation to a proposed planning application for the erection of a single wind turbine at Drummick, near Glenalmond, Perth. The proposed turbine lies at grid reference NN 953 268.
- 1.1.2. The objective of the appraisal was to provide detailed baseline information on which to determine the potential ornithological impacts of the proposed development.
- 1.1.3. Potential impacts on birds by wind energy projects are as follows:
 - Direct impacts- collision with turbine, overhead wires, fencing or guy lines,
 - Direct impacts- direct habitat loss due to access roads, temporary compounds and the turbine base,
 - Indirect impacts- habitat loss, disturbance and displacement.
- 1.1.4. Three methodologies were employed; a desk study and field surveys followed by a collision risk assessment.
- 1.1.5. Data from each method was combined to provide an overall evaluation of site ornithological value.

1.2. TURBINE SPECIFICATION

- 1.2.1. On commission of surveys the turbine specification comprised a single Enercon E70 wind turbine with a hub height of 57m and a 71m rotor diameter. The turbine has now been changed to an Enercon E48 wind turbine with a smaller 50m hub height and 48m rotor diameter.
- 1.2.2. The survey methodologies were based on the original E70 turbine however the evaluation and assessment sections relate to the E48 wind turbine.

2 METHODOLOGIES

2.1. DESK STUDY

- 2.1.1. The desk study identified statutory designated sites of nature conservation interest through a review of the Joint Nature Conservation Committee (JNCC) and Scottish Natural Heritage (SNH) websites.
- 2.1.2. Reference was also made to Ordnance Survey maps of the wider area and on-line aerial images (www.google.co.uk/maps) in order to determine any features of nature conservation interest in the wider area.
- 2.1.3. Biological data was obtained from the on-line National Biodiversity Network (NBN) Gateway and external records searches with the following organisations:
 - Leisure and Culture Dundee/Perth Museum Biological Records Centre.

- Scottish Raptor Study Group (SRSB).
- 2.1.4. Statutory designated sites for ornithological interest were identified up to a radius of 10km from the site.
- 2.1.5. A number of organisations and groups were contacted in order to obtain scoping opinions:
- Scottish Natural Heritage (SNH)
 - The Royal Society for the Protection of Birds (RSPB)
- 2.1.6. This information was collated in order to inform the field survey methodologies.

2.2. FIELD SURVEYS

- 2.2.1. Four survey techniques were used; Vantage Point surveys, black grouse *Tetrao tetrix* surveys, breeding raptor surveys and basic breeding bird surveys. The methodology for each is detailed below.
- 2.2.2. All surveys were completed by competent field ornithologists with experience of surveying and evaluating birds in relation to wind farm proposals using standardised methods.
- 2.2.3. The survey area was extended beyond the application boundary as appropriate for each methodology. Specific details are provided where appropriate below.

Vantage Point Surveys

- 2.2.4. The survey methodology followed Scottish Natural Heritage guidance (SNH, 2005, as revised 2010), using a single Vantage Point (VP1, Figure 1).

	VP 1
Grid Reference	295690, 726930

Table 2.1: Vantage Point Location

- 2.2.5. Each VP survey session in January – April 2011 was two-hours in duration and in May - December 2011 was three hours in duration. Where two or more survey sessions were completed on the same day a minimum one-hour gap was observed between surveys. Total survey effort completed is summarised in Table 2.2, below.

	Jan-11	Feb-11	Mar-11	Apr-11	May-11	June-11	July-11	Aug-11	Sept-11	Oct-11	Nov-11	Dec-11	Total
No. days	1	2	2	3	1	2	3	1	1	1	1	2	20
VP hours	6	12	8	14	3	12	9	6	6	6	6	12	100

Table 2.2: Vantage Point Survey Effort Summary

- 2.2.6. Vantage Point surveys were undertaken for an entire year comprising all four seasons in order to record activity of any breeding birds, migrating birds, wildfowl, raptors or waders utilising the site.

2.2.7. Surveys were conducted in variable weather conditions; however more emphasis was placed on days with low wind speed, high visibility and no rain.

2.2.8. Survey times were varied to avoid bias. Full details of all survey times and conditions are presented in Annex 1.

2.2.9. Flight lines were mapped for all target species passing through the survey area. Details of species, number of birds, flight height (in bands), duration and direction were noted on standardised recording forms. The following height bands were used in the field:

A-	<40m
B-	40m – 150m
C-	>150m

2.2.10. Although the turbine is only 77m in height, to account for observer error, a precautionary approach was undertaken in the field to record any flights at height band B and within 200m of the proposed turbine locations were classified as being within the 'collision risk window' (hereafter referred to as the CRW).

2.2.11. The full survey area is illustrated in Figure 1.

Target Species

2.2.12. Target species were selected by reference to the following documents:

- Joint Nature Conservation Committee (2001). Natura 2000 Standard Data Form: South Tayside Goose Roosts. Assessed online at <http://jncc.defra.gov.uk/default.aspx?page=1978> on 17/01/2012.
- Scottish Natural Heritage (2005, updated in 2010). Survey Methods To Assess The Impacts Of Proposed Onshore Wind Farms On Bird Communities. SNH, Edinburgh.
- Scottish Natural Heritage (2006) Assessing Significance of Impacts from onshore Windfarms on Birds outwith Designated Areas. SNH Guidance Note, SNH, Edinburgh.
- Species listed under Schedule 1 of the Wildlife and Countryside Act (1981, as amended)

2.2.13. In summary, target species were classified as Schedule 1 listed raptors (as listed on the Wildlife and Countryside Act 1981, as amended in Scotland), plus all waders, herons and wildfowl (with the exceptions of mallard and feral species).

Secondary Species

2.2.14. Secondary species were recorded in 5 minute summary intervals, noting the number of birds and general activity in order to build an overall picture of use of the site.

2.2.15. Secondary species were commoner raptors, mallard, raven, all gulls, any notable passerines and large concentrations of any commoner species.

Black Grouse Surveys

2.2.16. Black grouse surveys were completed in April 2011 as presence within the wider area was identified during the winter Vantage Point Surveys. The surveys followed guidance set out in Gilbert et al (1998) which covered an area of at least 1km from the proposed turbine

location, to identify any leks (display sites) in the area. The survey area is shown on Figure 6.

2.2.17. A transect route within the survey area was walked on two occasions which incorporated all habitats but concentrated on those areas considered most suitable, such as areas of moorland with woodland edge or scrub nearby.

2.2.18. Survey effort is detailed in Table 2.3 below.

Survey date	Times (to-from)	Weather
21/04/2011	04.45-06.30	Light southerly breeze, light infrequent precipitation, 2/8 cloud cover and good visibility.
24/04/2011	05.10-09.00	Light south-westerly breeze, low cloud with 2/8 cover, light infrequent precipitation and excellent visibility.

Table 2.3: Black Grouse Survey Effort.

Breeding Raptor Searches

2.2.19. In tandem with the black grouse surveys, searches of the wider area were made to identify any breeding Schedule 1 (WCA) raptors in the wider area which could potentially be impacted by the proposed scheme. The surveys also made note of any other species of interest such as concentrations of waders, wildfowl or upland birds. These were used to determine the use of the site and surrounding area by notable species in the context of the proposed development

2.2.20. The survey area was defined as approximately 1km from the proposed turbine location (see Figure 1).

Breeding Bird Surveys

2.2.21. Basic breeding bird surveys were completed, broadly following the Common Bird Census (CBC) method, as detailed in Gilbert et al. (1998).

2.2.22. Surveys comprised a site walkover through all habitats within 500m of the proposed turbine, where access permitted. Outside the land ownership boundary, access was restricted to public roads and footpaths.

2.2.23. A total of four survey visits were made, as detailed in Table 2.4 below.

Survey Date	Times (from – to)	Conditions
13/04/2011	06.00-11.00	5-3 south westerly wind, light rain and 8/8 cloud cover
26/05/2011	04.10-09.05	Low south westerly wind, 6/8 cloud cover
16/06/2011	04.50-09.35	Low westerly wind speed, 7/8 cloud cover
05/07/2011	04.35-08.40	Light westerly breeze, 6/8 cloud cover

Table 2.4: Breeding Bird Survey Effort and Conditions

- 2.2.24. . The purpose of the surveys was to determine the general assemblage of breeding birds in proximity of the turbine and is not intended to provide an estimate of population level.

2.3. COLLISION RISK MODELLING

- 2.3.1. The purpose of the surveys was to determine the general assemblage of breeding birds in proximity of the turbine and they are not intended to provide an estimate of population level.
- 2.3.2. Flight activity of vulnerable target species recorded during the field surveys were implemented into a collision risk model to assess the predicted mortality of the proposed turbine on protected species.
- 2.3.3. The Collision Risk Model used was based upon current Scottish Natural Heritage guidance Calculating a Theoretical Collision Risk assuming no avoiding action (SNH, 2000) and Band et al (2007) Developing field and analytical methods to assess avian collision risk at wind farms.

3 RESULTS

3.1. DESK STUDY

Statutory and Non-Statutory Designated Sites

- 3.1.1. The site does not form part of any statutory designated site of nature conservation importance.
- 3.1.2. Statutory designated sites within a 10km search radius are detailed below and showed in Figure 7. Information relating to SSSIs was obtained from citations available on the Scottish Natural Heritage Information website SNHI. Information on Special Protection Areas (SPA's), Ramsar sites and Sites of Conservation Concern (SACs) was obtained from the Joint Nature Conservation Committee (JNCC) website.

South Tayside Goose Roosts Special Protection Area (SPA) / Site of Special Scientific Interest (SSSI) / Ramsar Site.

- 3.1.3. The South Tayside Goose Roosts is a composite SPA with multiple designations for ornithological interest, comprising multiple locations (lochs, smaller water bodies and all other wetland habitats) within the surrounding area.
- 3.1.4. The South Tayside Goose Roosts was designated as a SPA in April 1993 under EC Directive 2009/147/EC on the Conservation of Wild Birds. The site comprises seven lochs: Carsebreck and Rhynd Lochs (x3), Drummond Lochs (x2), Dupplin Loch and Pitcarnie Loch, and also a number of small water bodies and wetland habitats totalling 331ha of land.
- 3.1.5. The nearest components of the SPA site are Dupplin Loch and Pitcarnie Loch located 9.7km south east of the proposed turbine. The two Loch are also known as the Dupplin Lakes and comprise 124ha of land in total. The site is of international importance for roosting pink-footed geese *Anser brachyrhynchus* and greylag geese *Anser anser*. Other waterfowl species recorded within the SPA as a whole include: wigeon *Anas penelope*, shoveler *Anas clypeata*, snipe *Gallinago gallinago*, curlew *Numenius arquata*, redshank *Tringa totanus*, mute swan *Cygnus olor*, whooper swan *Cygnus cygnus*, tufted duck *Aythya fuligula*, goldeneye *Bucephala clangula* and goosander *Mergus merganser*.

- 3.1.6. No other statutory designated sites with ornithological interest were identified within a 10km radius of the proposed application site.

Consultation

- 3.1.7. Scottish Natural Heritage and the Royal Society for the Protection of Birds were contacted to obtain scoping opinions, there responses are detailed below;

Consultee	Response
RSPB	<p>Email received 12/01/2012 from Claire Smith</p> <p><i>The proposed location is within an area of good wader habitat that our records show supports all five species of farmland breeding wader, including lapwing which are red listed and snipe, curlew and redshank which are amber listed.</i></p> <p><i>There are also several pairs of red kites in the wider area and a pair of osprey, RSPB monitors the red kite population but you would need to contact the Tayside Raptor Study group for records of other raptors.</i></p> <p><i>We would have some concern about a turbine of this size and access track in this location.</i></p>
SNH	No Response Received

Table 2.5: Consultation Response

Records Search

- 3.1.8. The desk study revealed that habitats within 5 kilometres of the site support a suite of species typical of the habitats within the region. No records had been received from the Records Centre or the SRSR at the time of writing therefore only pertinent records from the NBN Gateway are included.
- 3.1.9. The NBN Gateway identified several species considered potentially vulnerable to wind turbine developments (following SNH 2006 guidance) within the 10km square NN92 covering the site. These were; whooper swan, greylag goose, pink-footed goose, barnacle goose *Branta leucopsis*, osprey *Pandion halietus*, peregrine falcon *Falco peregrinus*, black grouse, golden plover *Pluvialis apricaria*, curlew, short-eared owl *Asio flammeus*, Crossbill species(records for *Loxia spp.* only) and capercaillie *Tetrao urogallus*.
- 3.1.10. In relation to the Project site; the agricultural fields, hedgerows, mature trees and coniferous plantation woodland probably support a suite of breeding birds typical of upland farmland and woodland habitats in the region including species of note (i.e. species listed as red or amber species of conservation concern Eaton *et al* 2001).

3.2. FIELD SURVEYS

- 3.2.1. Results for notable species in the context of the development are presented below, along with tabulated breeding bird survey results.
- 3.2.2. Full survey results are presented in Annex 2.

Vantage Point Surveys

- 3.2.3. After commencement of field surveys the turbine specification changed to a smaller turbine with a 50m hub height and 48m rotor diameter; flight lines between band A and B could not be distinguished and therefore a precautionary new Collision Risk Window (CRW) has been applied which includes all species recorded in flight within 200m of the proposed turbine and between ground level and 150m.

Target Species

- 3.2.4. All VP flights recorded are summarised for each target species below. These are illustrated as Figures 2 to 5. Additional species records from terrestrial surveys are also included and the full survey effort/results are presented in Annex 2.

Greylag Goose Anser anser

- 3.2.5. One flight was recorded in April 2011 comprising up to 15 birds outside the CRW.
- 3.2.6. A further two flights were recorded in December 2011 of up to 56 birds, above collision risk height.
- 3.2.7. A flock was recorded in June 2011, outside the wintering period of the greylag goose and is likely to comprise resident birds which are not linked to the South Tayside Goose Roosts SPA (Birds of Scotland, 2007).

Pink-footed Goose Anser brachyrhynchus

- 3.2.8. Two flights of pink-footed geese were recorded in April 2011. One flight comprised up to 245 birds and flew north, through the collision risk window. The second flight comprised only 41 birds and did not pass through the collision risk window.
- 3.2.9. Two pink-footed geese were present within the greylag goose flock recorded in June 2011,. These birds were also considered to be part of a resident population and are not considered to be linked to the SPA.

Grey Heron Ardea cinerea

- 3.2.10. Four flights of single birds were recorded, only one flight entered the CRW.
- 3.2.11. A single bird was recorded to fly south over the site on 01/04/2011, however no flight line was mapped as the bird did not enter the CRW.

Goshawk Accipiter gentilis

- 3.2.12. A total of six goshawk were recorded to fly through the site, which included four males, one female and a single bird of unidentified sex/age. Three flights were recorded to fly through the collision risk window and two flew at collision risk height, just outside the collision risk window.
- 3.2.13. A pair of goshawk was observed on 03/05/2011 outside the 1km buffer. The birds flew in a direct line to a known nest site.

Red Kite *Milvus milvus*

3.2.14. Fifteen red kites were recorded over the survey period, with only three passing through the collision risk window. Nine flights flew at collision risk height but were concentrated to the north east, 500m-1000m from the turbine. Three of the birds recorded had wing tags; a bird with a blue wing tag representing a bird from the Black Isle, North Scotland feeding station; one with the white wing tag representing a bird which was tagged in the East Midlands (England) and one with a red tag from a bird tagged in central Scotland.

3.2.15. Over two dates in August, five flights of single birds were observed outside the survey area.

Peregrine Falcon *Falco peregrinus*

3.2.16. Presence was noted at the beginning of the surveys in January 2011 of an adolescent male flying at collision risk height to the west of the turbine; however the flight did not pass through the CRW.

3.2.17. A second bird was noted in February 2011 just within the 1km buffer flying at collision risk height. This species was not recorded again until December 2011 where a single bird flew east of the site hunting over the conifer plantations; the bird did not pass through the CRW.

Osprey *Pandion haliaetus*

3.2.18. Six osprey flights were recorded throughout April, June and July 2011. All flights comprised single birds at varying height bands.

3.2.19. Four flights were recorded at collision risk height, but none of these passed through the collision risk window. Two of those birds were seen to be carrying fish, and one landed briefly, in the field to the north of the proposed turbine, by the Drummick farm complex.

3.2.20. All osprey activity was recorded to the east of the proposed turbine.

Curlew *Numenius arquata*

3.2.21. Curlew were recorded most frequently in March, May, June and August with a total of 93 individual birds noted within the survey area.

3.2.22. The majority of flights comprised individual birds, however on 28/03/2011 a total of 13 birds were recorded to fly within the survey area and land in the field to the east of the farmland track.

3.2.23. On 01/04/2011 twelve curlew flights were recorded, however due to poor weather conditions encountered after commencement of survey the flight lines have not been mapped. The majority of flights comprised single birds, with a total of 22 individuals recorded over the VP period. Five of those flights were recorded at collision risk height with three expected to have entered the collision risk window.

Lapwing *Vanellus vanellus*

3.2.24. Lapwing were the most commonly recorded species on site with activity generalised to the east of the turbine, with a total of 27 flights comprising 328 birds over the survey period.

3.2.25. Lapwing were recorded within the survey area from February till August 2011. The majority of flights comprised single birds, however five flights in March included up to 42 birds.

3.2.26. One flight of up to 100 individuals was recorded approximately 700m from the turbine on 28/8/2011.

3.2.27. No lapwing were recorded during the autumn/ late winter vantage point surveys.

3.2.28. Fifty-nine flights of lapwing were observed on 1/4/2011 within the survey area which were not mapped due to adverse weather conditions. These flights total 166 individual birds.

Snipe *Gallinago gallinago*

3.2.29. Observed on two dates, with only two flights recorded. A total of three birds passed through the CRW. One flight two birds involved drumming and territorial disputes 10m north of the proposed turbine.

3.2.30. A single 'chipping' snipe was also recorded on 28/03/2011 in the field adjacent to the turbine on the east.

Oystercatcher *Haematopus ostralegus*

3.2.31. Twenty-eight oystercatcher flights comprising a total of up to 41 birds were recorded over the survey season with the majority of activity recorded in July 2011.

3.2.32. Activity was generalised within the improved grassland fields to the east of the turbine however activity of up to two pairs was recorded at the turbine location.

3.2.33. On 01/04/2011 a further 15 flights of a total of 28 birds were recorded within the survey area, but were not mapped due to adverse weather conditions. Four flights were thought to have passed over the turbine location.

Cormorant *Phalacrocorax carbo*

3.2.34. A single bird was observed south west of the 1km buffer on 01/04/2011.

Short-eared Owl *Asio flammeus*

3.2.35. A single bird was observed hunting west of the 1km buffer on 03/05/2011.

Secondary Species

Tawny Owl *Strix aluco*

3.2.36. One bird was heard calling during the afternoon of 15/04/2011 from within the conifer plantation adjacent to the application site.

3.2.37. Another bird was heard calling from a similar position in December 2011.

Mallard *Anas platyrhynchos*

3.2.38. A total of 26 flights consisting of a maximum flock size of 41 birds. The majority of activity was centred on the pond 270m to the east of the turbine location.

Canada Goose *Branta canadensis*

- 3.2.39. Three flights of up to two geese were recorded over the survey period. Two flights were at collision risk height, however these did not enter the CRW.

Common Buzzard *Buteo buteo*

- 3.2.40. Recorded during most vantage point surveys, with birds recorded over the majority of the survey area.
- 3.2.41. In general, single birds were recorded to hunt over the site and up to 5 pairs are presumed to have been breeding nearby. Juveniles were also recorded in July in the plantation to the south of the turbine.
- 3.2.42. Peak activity was recorded on 08/06/2011 when 8 birds were seen simultaneously and 36 flights were recorded.

Kestrel *Falco tinnuculus*

- 3.2.43. Three flights of single hunting birds were recorded in February and March 2011 at collision risk height.
- 3.2.44. A further 22 flights were recorded in the breeding season (June- August 2011) of individual birds. Most birds were observed hunting to the east of the proposed turbine at heights below 20m.
- 3.2.45. A single bird was also noted in November 2011 outside the collision risk window.

Sparrowhawk *Accipiter nisus*

- 3.2.46. One bird flew north over the site while being mobbed by a kestrel in March 2011.
- 3.2.47. Fourteen flights of individual birds were recorded within the survey area. Both males and females were seen, hunting and displaying; it is likely there is a pair breeding close by.

Black-headed Gull *Chroicocephalus ridibundus*

- 3.2.48. Sixty-seven flights were recorded between April- June 2011 totalling 394 birds. The average number of birds per flight was 7, with peak flocks containing up to 84 birds. The majority of activity occurred in the fields closely surrounding the proposed turbine but were generally below collision risk height.

Common Gull *Larus canutus*

- 3.2.49. Recorded only in April and June 2011, 26 flights of individual birds were recorded within the improved grassland fields within the 1km buffer.

'Large' Gulls *Larus spp.*

- 3.2.50. Five flights of a single lesser black backed gull *Larus fuscus* were recorded over the survey season. All flights were below collision risk height.

- 3.2.51. Two flights of up to 6 greater black-backed gull *Larus marinus* were recorded on 08/08/2011. The flocks moved continuously throughout the survey and consequently lost and gained birds over the course of 3 hours.
- 3.2.52. Two flights of herring gull *Larus argentatus* were observed in May. A further two flights in June 2011 and one flight in December, totalling 4 birds were recorded, none of the flights passed through the collision risk window.

Common Raven *Corvus corax*

- 3.2.53. Forty-six flights were recorded during the surveys with a total of 76 birds. The majority of flights were recorded below collision risk height within the survey boundary over the conifer plantations.

Black Grouse Surveys

- 3.2.54. Vantage Point surveys identified the presence of black grouse within the wider area in April 2011. Full survey details are presented in Annex 2.
- 3.2.55. During Vantage Point surveys the following numbers were recorded at grid reference NN930264:
- 01/04/2011- 25 male black grouse at 13.00,
 - 05/04/2011- 16 males and 5 female black grouse at 14.00,
- 3.2.56. The first black grouse survey identified a lek of 33 males and 3 females at grid reference: NN 9338026420 (Lek 1). This lek is the same as identified during the earlier Vantage Point surveys and is located 2.3km from the turbine location. Numbers reached a peak on the second survey totalling 36 males and 5 females within the lek.
- 3.2.57. A second lek was identified 700m north of Lek 1, at grid reference NN 93614 27172 (Lek 2), 1.3km from the turbine location which comprised 18 males and up to 3 females in two separate fields.
- 3.2.58. The locations of both leks are shown on Figure 6.
- 3.2.59. No black grouse were observed within 1.3km of the proposed turbine location.
- 3.2.60. An area of young conifer plantation located 500m from the proposed turbine was identified as suitable habitat for black grouse; comprising young conifers, grassland and scrub. This area provides suitable habitat, however is isolated by up to 1.5km from known lekking areas.

Breeding Raptor Surveys

- 3.2.61. Breeding raptor surveys identified the following species breeding within the wider area:
- A single goshawk nest located outside the 1km survey area.
 - Two pairs of buzzard were confirmed to breed within 1km, within coniferous plantation woodland.

- A single red kite carrying nesting material was observed flying north, to the west of the survey area on 24/04/2011.
- A single osprey was observed flying west, 300m south of the proposed turbine location on 24/04/2011 (Figure 6), however no evidence of breeding nearby was recorded.
- A pair of short-eared owls were recorded frequently near the second black grouse lek. The pair were seen to be displaying and hunting over the moorland on 21/04/2011 (Figure 6).

Breeding Bird Surveys

3.2.62. Table 3.1, below summarises all breeding species recorded within 500m of the proposed turbine location.

Species	Scientific	Status Comments
Mallard	<i>Anas platyrhynchos</i>	Breeding confirmed of one pair at the pond, at the centre of the site.
Common Buzzard	<i>Buteo buteo</i>	Breeding confirmed of one pair within the isolated coniferous woodland stand.
Goshawk	<i>Accipiter gentilis</i>	Seen hunting on one occasion within the isolated coniferous woodland stand.
Lapwing	<i>Vanellus vanellus</i>	Breeding of up to 4 pairs confirmed within the improved grassland field, many more pairs noted outside the 500m survey buffer.
Curlew	<i>Numenius arquata</i>	Up to three pairs confirmed to breed, including one within 20-30m of the proposed turbine.
Oystercatcher	<i>Haematopus ostralegus</i>	Breeding confirmed of two pairs within the improved grassland fields to the east of the turbine.
Snipe	<i>Gallinago gallinago</i>	Breeding of up to 2 pairs likely.
Common Gull	<i>Larus canus</i>	Flock of seven individuals flying over site once.
Black-Headed Gull	<i>Chroicocephalus ridibundus</i>	Small number of individuals noted flying past the site.
Lesser Black-backed Gulls	<i>Larus fuscus</i>	Small numbers noted outside the survey area.
Woodpigeon	<i>Columba palumbus</i>	Numbers in excess of 10 recorded during each survey, breeding likely
Tawny Owl	<i>Strix aluco</i>	Noted within the isolated coniferous woodland stand.
Great Spotted Woodpecker	<i>Dendrocopos major</i>	Breeding likely of one pair.
Skylark	<i>Alauda arvensis</i>	Breeding confirmed of up to 4 pairs within the improved grassland fields.
Sand Martin	<i>Riparia riparia</i>	5 recorded flying over the site, no evidence of breeding.
Meadow Pipits	<i>Anthus pratensis</i>	Numbers in excess of 15 recorded, most likely to have bred.
Pied Wagtail	<i>Motacilla alba</i>	Breeding confirmed of up to 3 pairs in the Drummick farm building complex.

Species	Scientific	Status Comments
Wren	<i>Troglodytes troglodytes</i>	Up to 7 singing birds on site, breeding likely.
Dunnoek	<i>Prunella modularis</i>	Singing male recorded once.
Robin	<i>Erithacus rubecula</i>	Singing male recorded once.
Wheatear	<i>Oenanthe oenanthe</i>	Three individuals noted in April.
Blackbird	<i>Turdus merula</i>	Two singing males.
Song Thrush	<i>Turdus philomelos</i>	Three singing males on site and female seen, breeding likely.
Mistle Thrush	<i>Turdus viscivorus</i>	Recorded just outside the 500m buffer once.
Garden Warbler	<i>Sylvia borin</i>	Breeding confirmed of one pair.
Common Whitethroat	<i>Sylvia communis</i>	Singing male recorded once.
Willow Warbler	<i>Phylloscopus trochilus</i>	Up to 4 pairs likely to have bred.
Goldcrest	<i>Regulus regulus</i>	One pair likely.
Coal Tit	<i>Periparus ater</i>	Two pairs likely within coniferous woodland.
Great Tit	<i>Parus major</i>	Singing males noted in various locations onsite, minimum of two pairs likely to be breeding.
Blue Tit	<i>Cyanistes caeruleus</i>	Up to two pairs likely.
Jay	<i>Garrulus glandarius</i>	Calling males noted, one pair likely within the coniferous woodland to the south.
Rook	<i>Corvus frugilegus</i>	Two individuals recorded, no evidence of breeding.
Raven	<i>Corvus corax</i>	Noted flying over the site once.
Carrion Crow	<i>Corvus corone</i>	Calling birds heard in sections of woodland and large flocks of up to 22 birds recorded over the site.
Hooded Crow	<i>Corvus cornix</i>	Seen within a flock of carrion crow flying over the site.
Starling	<i>Sturnus vulgaris</i>	Flocks of up to 66 birds recorded over the site, with breeding confirmed within the Drummick building complex.
House Sparrow	<i>Passer domesticus</i>	Breeding of one pair confirmed within the Drummick building complex.
Chaffinch	<i>Fringilla coelebs</i>	Numbers in excess of 10 individuals breeding of up to 4 pairs likely.
Linnet	<i>Carduelis cannabina</i>	Two pairs confirmed to have bred, also flocks of up to 20 individuals passing over the site on two occasions.
Yellowhammer	<i>Emberiza citronella</i>	Two singing males recorded.
Reed Bunting	<i>Emberiza schoeniclus</i>	One singing male recorded.

Table 3.1: Breeding Bird Survey Results Summary

3.2.63. The survey area therefore supports a suite of typical farmland and woodland species found in the region, including some passerine species of local conservation value.

3.3. COLLISION RISK MODEL

3.3.1. A Collision Risk Model was undertaken in relation to the proposed Drummick wind energy Project to identify potential impacts upon target species. Full details are provided in Annex 3.

- 3.3.2. Two models were run: for directional flights (geese) and non-directional flights (raptors) through the CRW.
- 3.3.3. The first model predicted that one pink-footed goose would collide with the wind turbine every 20 years, representing 0.002% of the South Tayside Goose Roosts SPA population.
- 3.3.4. The second model predicted that with an avoidance rate of 98% (SNH, 2010) one red kite would collide with the turbine every 27 years and one goshawk every 49 years.

4 SITE EVALUATION

- 4.1.1. All wild birds, their nests and eggs are, with few exceptions, protected under the Wildlife and Countryside Act 1981 (as amended in Scotland). Over eighty species or groups of species are listed under Schedule 1 of the Act, which confers special protection with increased penalties for offences committed. Additional protection is provided to species listed under Annex I of the EC Council Directive on the Conservation of Wild Birds 2009/147/EC (the 'Birds Directive'). In addition, following recent revisions, fifty-nine species are now listed on the UKBAP.
- 4.1.2. The status of all British birds has been analysed by conservation agencies, including the RSPB, and the results are published in 'Birds of Conservation Concern 3' (Eaton et al. 2009). On the basis of ongoing population trends, species are assigned to one of three lists of conservation concern; red, amber or green list (in order of significance). Although the lists confer no legal status in themselves, they are useful in assessing the significance of impacts and appropriate levels of mitigation that may be required when birds are affected by a project or other activity.
- 4.1.3. In general with wind turbine developments, vulnerable species are considered to be scarcer raptors, upland waders and concentrations of waterbirds (Langston and Pullan, 2003 and Percival, 2005). Also, any site supporting large concentrations of commoner birds may be subject to negative impacts.
- 4.1.4. Scottish Natural Heritage (2006) guidance provides a list of species regarded as potentially vulnerable to the impacts of wind turbine projects. This list comprises both widespread species and species of restricted range.
- 4.1.5. The proposed turbine is located within the lowest zone of natural heritage sensitivity (Zone 1, SNH 2009) and within an area of low/ unknown species sensitivity (RPSB, 2005); therefore it is considered that significant impacts on breeding and/ or overwintering birds are considered unlikely overall.
- 4.1.6. In relation to the proposed development, potential impacts on Schedule 1 raptors, wildfowl, waders and black grouse are considered further due to their known presence in the wider area.
- 4.1.7. Vulnerable species have the potential to be impacted by the following;
- Construction and erection of the turbine- disturbance and habitat loss,
 - Operation of the turbine- displacement, disturbance and collision,
 - Cumulative impacts with other wind energy schemes,
 - Decommissioning of the wind turbine.

- 4.1.8. The habitats within the application site support a suite of breeding birds typical of upland farmland and woodland habitats in the region, including some widespread species listed as red or amber species in Birds of Conservation Concern. Such species are not generally considered to be vulnerable to any potential negative effects from operational wind turbines; however it is possible that some displacement of these species may occur, along with occasional collisions.
- 4.1.9. The primary ornithological value of the area is its potential to support passage and wintering waterfowl (associated with the South Tayside Goose Roosts SPA and corresponding statutory designations), black grouse and breeding Schedule 1 raptors.
- 4.1.10. Construction-related activity could lead to increased disturbance and will require a small amount of temporary and permanent habitat loss. Any habitat loss within the breeding season could lead to destruction or disturbance of active nest sites. As land-take will be minimal, such impacts are considered likely to be negligible.
- 4.1.11. Once operational, impacts could potentially arise from collision and/or displacement effects. Collision is unlikely to be a significant issue for waders such as curlew, lapwing and oystercatcher, but these may be subject to minor levels of displacement.
- 4.1.12. Activity of wildfowl, in particular pink-footed goose and greylag goose, was low, with only five flights recorded and no concentrations of wildfowl were recorded within the 1km survey buffer over a 12 month period.
- 4.1.13. The habitats available on site are unlikely to be important for species designated under the composite SPA; however it is possible that these species may occasionally fly over the site or infrequently utilise the arable farmland surrounding the proposed turbine.
- 4.1.14. Only one flight of a pink-footed goose flock was recorded to fly through the collision risk window of the proposed turbine. Based on this single flight, it is predicted (by using the Collision Risk Model) that one bird will be killed over the lifespan of the Drummick wind turbine. This predicted mortality rate is representative of 0.002% of the South Tayside Goose Roosts SPA and therefore potential impacts are not considered to be significant.
- 4.1.15. Disturbance and displacement impacts on geese are not anticipated due to the lack of birds recorded in the study area in 2011.
- 4.1.16. Low levels of grey heron activity was recorded over the survey period. None of these flights fell within the CRW.
- 4.1.17. Raptor activity within the survey area was generally low, although the surrounding area is likely to support commoner species such as the buzzard.
- 4.1.18. Goshawk were confirmed to breed within 2km of the proposed turbine, although relatively low levels of activity was recorded over the proposed turbine throughout the breeding season. All six flights were within 500m of the turbine, one of which entered the collision risk window.
- 4.1.19. Goshawk are considered to be vulnerable to wind turbine developments under current SNH guidance (2010) however the guidance suggests only nests within 1km of the turbine location are to be subject to detailed survey. The identified nest is located at a greater distance and although activity has been recorded over the turbine location, the survey area is unlikely to provide core foraging habitat for this species.

- 4.1.20. The single goshawk flight was entered into a Collision Risk Model. This predicted that one bird may be killed every 49 years; therefore it is unlikely that any birds will be killed during the operational life of the Drummick wind turbine.
- 4.1.21. Red kite are also considered vulnerable to the effects of wind turbines. By using the Collision risk model it is estimated that a bird is likely to collide with the wind turbine once every 27 years. Therefore it is considered likely that there will be no significant impacts on red kites.
- 4.1.22. Peregrine, osprey, short-eared owl and tawny owl may be present within the surrounding habitats; however the survey area is unlikely to support these breeding species due to more suitable habitat existing outside the site boundary.
- 4.1.23. Medium levels of widespread wader species such as curlew, lapwing and oystercatcher were recorded to breed within the survey area; however the majority of activity was generalised 400m to the east of the proposed turbine.
- 4.1.24. Snipe were recorded displaying over the turbine location on two occasions in the breeding season. It is likely they are breeding onsite and are therefore also subject to minor levels of displacement; although not considered vulnerable to collision impacts.
- 4.1.25. Minor levels of disturbance and displacement to breeding upland waders, such as curlew and snipe could be expected to occur during the operation of the wind turbine (Pearce-Higgins *et al* 2009); however recent studies by Natural Research (Whitefield, Green and Fielding, 2010) on various wind farm sites across the UK, found little evidence of displacement of curlew.
- 4.1.26. Two black grouse leks were recorded within 3km of the proposed turbine in the 2011 breeding season, the largest of which contained 36 lekking males.
- 4.1.27. Black grouse numbers in the UK have been declining each year since 1990 and they are shown to be particularly sensitive to collision with man-made structures such as fences and power lines. There have also been reports of collisions with wind turbines in Scotland and Austria (T. Durr in Hotker *et al.*, 2006).
- 4.1.28. However, black grouse populations are considered to be more susceptible to human disturbance than direct collision impacts.
- 4.1.29. The two leks are also isolated from the Drummick wind turbine construction site by an extensive area of conifer plantation of up to 2.4km, therefore no significant impacts on black grouse are anticipated.
- 4.1.30. As with any wind turbine development it is not possible to preclude potential impacts on individual birds. However, due to the limited number of notable species recorded during the field survey, collision incidents for sensitive species (i.e. those listed in SNH guidance) will be rare at worst. Occasional collisions with commoner species cannot be discounted; however no impacts are predicted for any species at population level. Also any potential displacement impacts on commoner wader species are unlikely to be significant.

REFERENCES

- Band et al. (2007) Developing field and analytical methods to assess avian collision risk at wind farms
- Eaton, M.A., Brown, A.F., Noble, D.G., Musgrove, A.J., Hearn, R., Aebischer, N.J., Gibbons, D.W., Evans, A. and Gregory, R.D. (2009). *Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man*. British Birds 102, pp296-341.
- Gilbert et al. (1998). *Bird Monitoring Methods: A manual of techniques for key species*. RSPB/BTO/JNCC/WWT/ITE/The Seabird Group RSPB/BTO, Sandy.
- Natural England Technical Information Note TIN008 (2007). *Assessing ornithological impacts associated with wind farm developments: surveying recommendations*. Natural England, Wakefield.
- Natural England Technical Information Note TIN069 (2010). *Assessing the effects of onshore wind farms on birds*. Natural England, Peterborough
- Pearce-Higgins, J.W. , Stephen, L., Langston, R.H.W., Bainbridge, I.P. and Bullman, R. (2009). *The distribution of breeding birds around upland wind farms*. Journal of Applied Ecology 46: 1323-1331
- Percival, S.M. (2005). *Birds and wind farms: what are the real issues?* British Birds 98: 194-204.
- Scottish Natural Heritage (2005, updated 2010). *Survey Methods To Assess The Impacts Of Proposed Onshore Wind Farms On Bird Communities*. SNH, Edinburgh.
- Scottish Natural Heritage (2006) *Assessing Significance of Impacts from onshore Windfarms on Birds outwith Designated Areas*. SNH Guidance Note, SNH, Edinburgh
- Whitfield, D. P., et al (2010) *Are Breeding Eurasian Curlew displaced by wind energy developments?* Natural Research Projects Ltd. Banchorcy, Scotland

ANNEX 1: VANTAGE POINT SURVEY EFFORT AND CONDITIONS

Table A1.1, below details VP survey effort and weather conditions.

The following codes are used to record weather conditions in Table A1.1.

Wind Speed	Cloud Height
Calm	<150m
Light air	150-500m
Light breeze	>500m
Gentle breeze	
Moderate breeze	
Fresh breeze	
Strong breeze	
Moderate gale	
Fresh gale	
Strong gale	
Whole gale	
Storm	

Wind Direction
16 point compass

Rain	0
None	1
Drizzle/mist	2
Light showers	3
Heavy showers	4
Heavy rain	
Visibility	0
Poor	1
<1km	2
>1km	

Table A1.1. Vantage Point Survey Effort and Conditions

Date	VP	Start Time	Finish Time	No. Hours	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow	Species Comments
07/01/11	1	14.30	16.30	2.00	-	-	-	1	2	2	2	2	
28/01/11	1	07.30	09.30	2.00	1	E	-	7	2	2	-	-	
28/01/11	1	10.00	12.00	2.00	2	E	-	7	2	2	-	-	Great grey shrike flew past VP at 11.59, seen again later in a tree near VP
04/02/11	1	07.55	09.55	2.00	2	E	3	7-8	2	2	-	-	The guy at house beside Drummick says he has seen a red kite from house. He has not seen since Christmas but reckons his highest count is 5, says they appear most in westerlies No geese in area
04/02/11	1	10.15	12.15	2.00	2	NE	3-2	7-6	2	2	-	-	Flock of 270 chaffinches in field next to VP as usual, checked them for brambling - none BZ still in tree No sign of great grey shrike
14/02/11	1	12.50	14.50	2.00	1-2	SE	2-0	7-6	2	2	-	-	No wildfowl in area and no great grey shrike
14/02/11	1	15.10	17.10	2.00	2	SE	-	6-8	2	2	-	-	No priority species, unusual here, usually raptors
27/02/11	1	11.40	13.40	2.00	4-5	W	-	1-3	2	2	-	-	2 KT at 11.44 - displays and territorial flights, interacting, *L. take ages to decide to land again, circle round endlessly! Several times they move within same field as at 12.36 - not mapped each time as flights short and very low. Jumpy and harassed by corvids Probably at least 8 different BZ
27/02/11	1	14.10	16.10	2.00	5	NW-NNW	-	6	2	2	-	-	Male sparrowhawk flew past car during break L. still in field 7
03/03/11	1	13.55	15.55	2.00	-	-	-	8	1-2	2	-	-	
03/03/11	1	16.25	18.25	2.00	-	-	-	8-7	2	2	-	-	No BZ activity at all

Date	VP	Start Time	Finish Time	No. Hours	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow	Species Comments
28/03/11	1	15.50	17.50	2.00	3	SSW	-	8	2	2			
28/03/11	1	18.05	20.05	2.00	3	SSW	-	8-6	2	2			SE displaying pair around NN930/275 18.22 and 18.41-18.53 BK 2 greyhens feeding NN933/272 19.45 onwards After VP checked area - lekking birds heard around NN936/272 (too dark to observe any birds)
01/04/11	1	06.50	08.50	2.00	-	-	1+3	8	0	1	-	-	
01/04/11	1	09.05	11.05	2.00	1-3	S	2-0	8	0-1	1-2	-	-	
15/04/11	1	14.50	17.50	3.00	2-3-3	SW	-	8	2	2	-	-	KT - W to site - Tawny owl hooting 1500 - 1528 - see sheet
15/04/11	1	18.20	21.20	3.00	2-1-1	SW-WSW	-	8-6-4	2	2	-	-	see sheet
21/04/11	1	09.40	11.40	2.00	0-1	E	0-2	8-7	1-2	2	-	-	1 ♂ MA and 1 pair Win (wigeon) in field 7 at * on arrival At least 20 L. on individual territories in south half of field 7 along, probably more as there is plenty of 'dead ground' / Other species of note: TS (2) in hedge at VP, GS, many S. Singing in flight, influx 9 W. in field 7 as above 11.30 ? Migrants CU heard calling intermittently from fields 7, 8 and 9
21/04/11	1	12.10	14.10	2.00	2	E	-	7-4	2	2	-	-	At start MA ♂ still in field 7 near VP, ♀ probably sitting nearby WN gone from field 7, OC pair in field 7 at (A) and also pair in field 5 at (B) foraging GS on posts between fields 2 and 33rd OC pair field 6 at (C) foraging Other species of note: mosst of the W. now gone (moved through), J., S. Generally less L. activity/flights/territorial display 4th OC pair noted 13.30 at top of field 4 at (D)
03/05/11	1	04.20	07.20	3.00	0-1	E	-	8-4-3	2	2	-	-	BH* - regular lights heights 1 & 2, 1-5 individuals from 06.00 onward (not mapped) Short-eared owl hunting west of 1km buffer 06.00 onward Singing passerines not seen on BBS : RB, GH, WH Wader activity summary - see sheet

Date	VP	Start Time	Finish Time	No. Hours	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow	Species Comments
03/05/11	1	08.20	11.20	3.00	1-2-3	E-ESE	-	4-5-3	2	2	-	-	Goshawk observation 09.03 - pair flying in direct line with nest site (♀ returning in direction of nest) Forest rides and location of pluck post suggests that there may be reg flight line along W edge of 1km buffer
08/06/11	1	06.45	09.45	3.00	2-3-2	E	2-0-2	8-7-8	1-2	2			GI Murray's Hill - nest still active (♂♀ alarm), unable to observe nest from distance now due to considerable number of wind-blown trees in immediate vicinity of nest tree
08/06/11	1	10.45	13.45	3.00	3	E	2(3)-0	8-6-5	1-2	2			
14/06/11	1	16.30	19.30	3.00	2	W		7	2	2			A pair of Ospreys moved through the site - one at lower level than the other A couple of movements each involving CU and OC3 flights involving lapwing, 1 bird appeared to be on territory in field 6 Curlew heard but not seen at 18.30 OC heard by not seen at 18.44
14/06/11	1	12.30	15.30	3.00	2	W		6-5	2	2			3 lapwing frequenting field 7 with 1 bird constantly chasing corvids Constant BH and CM activity in fields 1, 4 and 41 Constant BZ activity in buffer zones and across site Lapwing on territory in field 6 Curlew heard but not seen at 15.07
27/06/11	1	09.30	12.30	3.00	1	ESE		8	2	2			4 flights involving oystercatcher and 1 of curlew Curlew also heard on 4 occasions but not located Secondary species were mainly gulls - LB, CU and BH, often loitering on site and favouring fields 7 and 41 Buzzard also noted on a few occasions 2 flights of curlew noted, also heard curlew on 3 occasions without seeing them
27/06/11	1	13.30	16.30	3.00	1-2	ESE		8	2	2			1 flight of oystercatcher noted, also heard OC on 2 occasions without seeing them Secondary species mostly BH and CM, present across site but favouring fields 4, 41, 7 and 6. Some birds also passed through without foraging Buzzards also noted, mostly in buffer zones
11/07/11	1	06.45	09.45	3.00	2	WNW	0-2-0	8-7-6	2	2			Osprey noted carrying unidentified object, flew through buffer at height 33 OC flights, 2 involving single birds and 1 involving a flock of 15 birds, this flock appeared to be located in fields 14-19 and so could be heard more often than see from VP Secondary species were buzzards, kestrel, sparrowhawk and raven Red

Date	VP	Start Time	Finish Time	No. Hours	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow	Species Comments
													squirrel observed at 08.33 in trees between fields 2 and 5, see X on map
11/07/11	1	10.15	13.15	3.00	2-1	NE-E	0-3	7-8	2	2			2 oystercatcher flights noted, also appeared to be an injured OC in field 7 throughout survey
													Secondary species included buzzard, LB and raven
21/07/11	1	13.20	16.20	3.00	1	NNW-W	2	8-7	2	2			Very quiet ornithologically, very little bird activity of any species
21/07/11	1	17.20	20.20	3.00	1-0	W	0-3	8	2	2			2 OC (ads) foraging in field 7, probably the pair seen earlier from start of watch to end 20.02 ♀ mallard and 4 young ducklings walked across W of field 7, next to VP
08/08/11	1	12.45	15.45	3.00	5	N		6-7	2	2			Curlw noted with 3 flights involving a total of 4 birds2 oystercatchers observed on the ground in field 7 throughout survey but no flights recorded Secondary species; raven, kestrel, buzzard, LB and GB flock in field 7 throughout survey
08/08/11	1	16.45	19.45	3.00	5	N		8-5-3	2	2			A wing-tagged adult red kite spent 8 minutes passing through site and buffer zone6 curlw flights were noted involving a total of 7 birds1 mallard flight2 oystercatcher flights were noted Secondary species; buzzard, raven, LB and GB
28/08/11	1	09.10	12.10	3.00	6	W-WNW		8	2	2			2 OC foraging in field 7 throughout watch
28/08/11	1	13.10	16.10	3.00	6-5-6	WNW		8	2	2			2 OC foraging in field 7 throughout watch
16/09/11	1	07.00	10.00	3.00	2	SW		4	2	2			No target species, only BZ and SH seen
16/09/11	1	14.00	17.00	3.00	2	SW		6	2	2			No target species, only BZ seen.
12/10/11	1	08.10	11.10	3.00	1	E		1	2	2			No Target species

Date	VP	Start Time	Finish Time	No. Hours	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow	Species Comments
12/10/11	1	12.30	15.30	3.00	2	NE-E		2	2	2			No target species. 2 BZ and 10 L. off site to the NE.
16/11/11	1	07.30	10.30	3.00	2-3	NW		2	2	2			No Target species, BZ and K. seen
16/11/11	1	14.30	17.30	3.00	1	N		4	2	2			No Target species, BZ only.
10/12/11	1	09.40	12.40	3.00	1	nw	0	7/8	2	2	2	1	no target species, buzzard, raven recorded. Also shooting heard to the NW of the application site.
10/12/11	1	13.40	16.40	3.00	1	nw	0	6/8	2	2	2	1	grey heron, greylag goose and peregrine. Secondary: raven and buzzard. Shooting to NW and tawny owl heard at 16.30 near fields 3 and 5
11/12/11	1	07.40	10.40	3.00	2	ssw	2	8/8	2	2	0	1	no target species. Secondary: buzzard, raven and herring gull. Tawny owl also heard at 7.40 near field 4
11/12/11	1	11.40	14.40	3.00	2	ssw	0	6/8	2	2	0	1	greylag goose, buzzard. Occasional gunshot to NW

Total: 118 hours

ANNEX 2: SURVEY RESULTS

The following Tables are presented in Annex 2:

Table A2.1	All Target Species Flights Recorded.
Table A2.2	Target Species with no Mapped Flightlines.
Table A2.3	Secondary Species Data
Table A2.4	Raptor Survey Data
Table A2.5	Breeding Bird Survey Data
Table A2.6	Black Grouse Survey Data

Table A2.1 All Target Species Flights Recorded

Flights within the CRW are highlighted.

Species are listed alphabetically

Species	Number of Birds	Date	Start Time	Duration	CRM	Comments
Eurasian Curlew	8	03/03/2011	16.59	104	FALSE	
Eurasian Curlew	1	28/03/2011	15.51	22	TRUE	
Eurasian Curlew	2	28/03/2011	16.06	18	TRUE	Display
Eurasian Curlew	1	28/03/2011	17.08	18	TRUE	
Eurasian Curlew	1	28/03/2011	17.30	15	TRUE	Not observed in full followed GI
Eurasian Curlew	4	28/03/2011	17.39	78	TRUE	Landed field 7
Eurasian Curlew	1	28/03/2011	18.09	16	TRUE	Display
Eurasian Curlew	1	28/03/2011	18.11	22	TRUE	
Eurasian Curlew	4	28/03/2011	18.29	15	TRUE	
Eurasian Curlew	2	28/03/2011	18.35	26	TRUE	Display
Eurasian Curlew	1	28/03/2011	19.12	21	TRUE	

Species	Number of Birds	Date	Start Time	Duration	CRM	Comments
Eurasian Curlew	13	28/03/2011	19.25	33	TRUE	Landed in field 7
Eurasian Curlew	2	15/04/2011	16.04	18	TRUE	DISPLAYING
Eurasian Curlew	2	15/04/2011	17.10	157	TRUE	landed f 4
Eurasian Curlew	2	15/04/2011	18.22	51	TRUE	DISPLAY LANDED IN F4
Eurasian Curlew	1	21/04/2011	10.36	22	TRUE	SLOW UNDULATING DISPLAY
Eurasian Curlew	1	21/04/2011	11.00	32	TRUE	slow undulating display
Eurasian Curlew	1	21/04/2011	11.25	25	TRUE	
Eurasian Curlew	1	03/05/2011	05.28	115	TRUE	Landed F7
Eurasian Curlew	1	03/05/2011	06.18	134	TRUE	Landed F7
Eurasian Curlew	1	03/05/2011	09.09	101	TRUE	
Eurasian Curlew	1	03/05/2011	06.29	132	TRUE	
Eurasian Curlew	1	03/05/2011	07.01	113	TRUE	Landed F4
Eurasian Curlew	1	03/05/2011	07.12	105	TRUE	
Eurasian Curlew	1	08/06/2011	07.34	8	FALSE	Display
Eurasian Curlew	1	08/06/2011	11.47	80	TRUE	
Eurasian Curlew	4	14/06/2011	18.14	90	TRUE	Flew through in a group calling occasionally
Eurasian Curlew	3	14/06/2011	18.44	120	FALSE	Flew through calling
Eurasian Curlew	1	27/06/2011	10.30	60	TRUE	Flew through calling
Eurasian Curlew	1	27/06/2011	13.40	30	TRUE	Cirled then landed in field 4 calling
Eurasian Curlew	6	27/06/2011	16.12	30	FALSE	Flew over calling in small flock
Eurasian Curlew	2	08/08/2011	13.33	10	TRUE	Flew into field 7 and began to forage, 2 more birds then appeared from a dip in field to join them
Eurasian Curlew	4	08/08/2011	13.56	10	TRUE	Flew short distance across field 7 calling then landed together
Eurasian Curlew	3	08/08/2011	14.27	90	TRUE	Flew off calling
Eurasian Curlew	1	08/08/2011	17.11	10	TRUE	Flew briefly calling
Eurasian Curlew	3	08/08/2011	17.31	15	TRUE	Flew across field 7 calling
Eurasian Curlew	3	08/08/2011	17.41	45	TRUE	Flew off south calling
Eurasian Curlew	1	08/08/2011	17.50	10	TRUE	Flew across field 7 and landed again
Eurasian Curlew	1	08/08/2011	18.07	10	TRUE	Flew across field 7
Eurasian Curlew	4	08/08/2011	19.44	20	TRUE	Flew across field 7
Northern Goshawk	1	07/01/2011	15.03	10	TRUE	Probable male, flew low across treetops
Northern Goshawk	1	28/03/2011	17.29	26	FALSE	Female mobbed at distance by 8 CU

Species	Number of Birds	Date	Start Time	Duration	CRM	Comments
Northern Goshawk	1	15/04/2011	15.05	38	TRUE	Probable male
Northern Goshawk	1	15/04/2011	19.34	72	FALSE	Probable male
Northern Goshawk	1	21/04/2011	09.41	96	FALSE	GI seen almost immediately - harrassed by RN briefly
Northern Goshawk	1	03/05/2011	08.28	213	TRUE	Male circling soaring flight, gaining height, lost as flew NW
Greylag Goose	15	01/04/2011	07.16	8	FALSE	Flew F7 - F8
Greylag Goose	14	08/06/2011	09.21	154	TRUE	GJ (PG) 14 (2)
Greylag Goose	44	10/12/2011	14.03	75	FALSE	DIFFICULT TO LOCATE FLIGHTLINE
Greylag Goose	12	11/12/2011	13.49	80	FALSE	
Grey Heron	1	28/01/2011	10.58	4	FALSE	
Grey Heron	1	10/12/2011	13.53	45	TRUE	LANDED ONSITE IN FIELD 5
Grey Heron	1	10/12/2011	15.19	23	FALSE	LANDED IN FIELD 5
Grey Heron	1	10/12/2011	15.21	56	TRUE	
Red Kite	2	27/02/2011	11.44	186	TRUE	Drifted E
Red Kite	2	28/03/2011	19.15	275	TRUE	
Red Kite	1	01/04/2011	07.45	12	FALSE	Landed in conifer. tagged RHS = red tag, green base, number 8
Red Kite	1	01/04/2011	07.58	5	FALSE	Flew SSW over trees - lost from view
Red Kite	1	01/04/2011	09.54	39	FALSE	Landed field 1 obscured from VP
Red Kite	1	01/04/2011	10.05	99	TRUE	
Red Kite	1	15/04/2011	15.30	103	TRUE	Lost as dropped height
Red Kite	1	15/04/2011	19.04	118	TRUE	Pale blue tags
Red Kite	1	15/04/2011	19.15	134	TRUE	Drifted E at height, 2nd KT north of buffer
Red Kite	2	03/05/2011	07.15	360	FALSE	Circling area marked in 1km buffer, gaining great height
Red Kite	1	03/05/2011	08.51	234	FALSE	Circling/soaring at great height
Red Kite	1	08/06/2011	12.32	148	FALSE	Lost against hillside
Red Kite	1	08/08/2011	16.48	480	TRUE	Slowly drifted through circling & rising & dropping in height, bird had white tag on r.wing
Red Kite	1	28/08/2011	10.04	71	TRUE	Keeping fairly low in wind
Red Kite	2	28/08/2011	13.25	89	TRUE	Drifting east, 1 bird stayed higher (2/3), lower bird followed
Northern Lapwing	1	27/02/2011	11.42	84	TRUE	Came off ground
Northern Lapwing	26	27/02/2011	12.00	248	TRUE	See above
Northern Lapwing	26	27/02/2011	12.35	25	TRUE	Moved within field
Northern Lapwing	42	03/03/2011	14.46	98	TRUE	Landed in field

Species	Number of Birds	Date	Start Time	Duration	CRM	Comments
Northern Lapwing	42	03/03/2011	15.10	299	TRUE	Take ages to settle again
Northern Lapwing	42	03/03/2011	15.51	248	TRUE	Flock apparently moving off N
Northern Lapwing	24	03/03/2011	15.42	212	TRUE	
Northern Lapwing	3	03/03/2011	16.29	164	TRUE	Landed in field
Northern Lapwing	2	28/03/2011	18.32	22	FALSE	Display
Northern Lapwing	2	03/05/2011	06.12	112	TRUE	Outward flight, displayed/chased L. in field 4
Northern Lapwing	2	03/05/2011	06.12	73	TRUE	Return flight
Northern Lapwing	1	03/05/2011	06.52	153	TRUE	
Northern Lapwing	1	08/06/2011	06.59	11	TRUE	
Northern Lapwing	1	08/06/2011	07.02	8	TRUE	
Northern Lapwing	2	08/06/2011	07.33	152	TRUE	
Northern Lapwing	1	08/06/2011	08.44	81	TRUE	
Northern Lapwing	1	08/06/2011	12.14	22	TRUE	Display, alternative height 1/2
Northern Lapwing	1	14/06/2011	17.36	30	TRUE	Flew from field 41 to field 7
Northern Lapwing	1	14/06/2011	18.02	45	TRUE	Flew off from field 7 calling and heading south
Northern Lapwing	1	14/06/2011	18.18	360	TRUE	Chased off crow then flew around at height calling for several minutes before landing in field 6
Northern Lapwing	1	14/06/2011	19.02	30	TRUE	Flew from field 7 to 41
Northern Lapwing	1	14/06/2011	14.14	60	TRUE	
Northern Lapwing	1	14/06/2011	14.37	15	TRUE	Brief flight
Northern Lapwing	1	14/06/2011	15.25	30	TRUE	Chased off rook
Northern Lapwing	1	14/06/2011	15.29	30	TRUE	Alarm calling in response to SH
Northern Lapwing	1	14/06/2011	12.30	30	FALSE	1 bird in field 7 made up to 12 flights in response to corvids, flying for short periods of 30 seconds
Northern Lapwing	100	28/08/2011	14.36	10	TRUE	Seen briefly a long way away to east
Oystercatcher	2	28/03/2011	16.15	23	FALSE	
Oystercatcher	2	28/03/2011	16.20	35	TRUE	
Oystercatcher	1	28/03/2011	18.23	31	TRUE	
Oystercatcher	2	28/03/2011	18.25	55	TRUE	Alarming
Oystercatcher	2	28/03/2011	19.09	31	TRUE	
Oystercatcher	2	21/04/2011	11.05	9	TRUE	
Oystercatcher	1	21/04/2011	11.29	42	TRUE	One of PR from 6 above - other still sitting in field 9

Species	Number of Birds	Date	Start Time	Duration	CRM	Comments
Oystercatcher	2	08/06/2011	11.52	40	TRUE	Landed field 1
Oystercatcher	1	14/06/2011	18.53	60	TRUE	Flew through calling
Oystercatcher	2	14/06/2011	19.28	30	FALSE	Flew across field 5 to 41 calling
Oystercatcher	2	14/06/2011	15.14	30	TRUE	Dropped down calling
Oystercatcher	1	14/06/2011	15.28	45	FALSE	Flew around calling then dropped out of view
Oystercatcher	2	27/06/2011	09.51	30	TRUE	Flew from field 7 to field 39
Oystercatcher	1	27/06/2011	10.29	30	TRUE	Flew around calling then lost to view
Oystercatcher	1	27/06/2011	11.05	60	TRUE	
Oystercatcher	1	27/06/2011	11.35	30	TRUE	
Oystercatcher	4	27/06/2011	16.26	180	TRUE	Chasing each other and calling
Oystercatcher	1	11/07/2011	06.46	25	TRUE	Flew up calling from field 4
Oystercatcher	1	11/07/2011	07.05	15	TRUE	Flew low over site
Oystercatcher	15	11/07/2011	07.21	10	FALSE	Flock calling rose up then dropped back out of view
Oystercatcher	1	11/07/2011	10.47	20	TRUE	Flew from field 41 to field 5 calling
Oystercatcher	1	11/07/2011	10.47	30	TRUE	Circled field 41 calling then landed out of sight
Oystercatcher	1	21/07/2011	14.10	10	TRUE	Had been roosting in field, woke up and flew to field edge to forage
Oystercatcher	1	21/07/2011	14.14	15	TRUE	2nd bird, flew within field <1m height
Oystercatcher	1	21/07/2011	15.14	21	TRUE	Disturbed by shooting
Oystercatcher	1	21/07/2011	15.15	46	TRUE	Disturbed by shooting
Oystercatcher	1	21/07/2011	15.25	41	TRUE	Probably no. 4 returning
Oystercatcher	1	21/07/2011	18.40	9	TRUE	Very low, changing field position
Oystercatcher	2	08/08/2011	18.31	30	FALSE	Flew from field 7 to field 8 calling
Oystercatcher	1	08/08/2011	18.40	45	TRUE	Flew off high to east
Oystercatcher	2	28/08/2011	09.14	14	FALSE	Changing position in field
Osprey	1	15/04/2011	15.31	128	TRUE	Carrying large fish (perch?)
Osprey	1	15/04/2011	19.38	25	FALSE	Carrying fish, lost behind trees
Osprey	1	08/06/2011	11.27	138	TRUE	Lost against hillside
Osprey	1	14/06/2011	16.57	180	TRUE	Flew in, circled, dropped into field 4 then took off again
Osprey	1	14/06/2011	16.57	240	TRUE	2nd bird high up calling before drifting off west
Osprey	1	11/07/2011	09.19	60	FALSE	Flew through buffer carrying item (not fish)
Peregrine Falcon	1	28/01/2011	10.10	34	TRUE	Ad male

Species	Number of Birds	Date	Start Time	Duration	CRM	Comments
Peregrine Falcon	1	27/02/2011	14.50	109	FALSE	Ended with massive stoop
Peregrine Falcon	1	10/12/2011	15.00	50	TRUE	Appeared to drop into trees, hunting?
Pink-footed Goose	245	15/04/2011	19.50	120	TRUE	
Pink-footed Goose	41	21/04/2011	11.07	75	FALSE	Heading North probably migrants
Snipe	1	01/04/2011	09.48	38	TRUE	Mainly at height B, dived to height A
Snipe	2	03/05/2011	06.34	296	TRUE	Chasing and drumming flight in area

Table A2.2 Target Species with no flight lines

Species Code	Species	Species Code	Species
CU	Eurasian Curlew	SN	Snipe
L.	Lapwing	OC	Oystercatcher
GI	Northern Goshawk	KT	Red Kite
OP	Osprey		

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
28/03/2011	17.35	17.50	SN	1					1 heard chipping field 5 duration <5s
01/04/2011	06.50	07.05	CU	1	1				F7 S
01/04/2011	07.05	07.20	OC	2	1				
01/04/2011	07.05	07.20	L.	1	1				F7 S
01/04/2011	07.05	07.20	OC	1	1				
01/04/2011	07.05	07.20	CU	1	1-2				
01/04/2011	07.05	07.20	H.	1	1				Flew S
01/04/2011	07.05	07.20	L.	1	1				F7 S
01/04/2011	07.05	07.20	OC	1	1-2				F7 S " F7 N
01/04/2011	07.05	07.20	CU	1	1				F7 S
01/04/2011	07.05	07.20	L.	2	1				F7 S

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
01/04/2011	07.05	07.20	L.	4	1				F7 S
01/04/2011	07.05	07.20	L.	2	1-2				Occasionally rising ³ 30m
01/04/2011	07.20	07.35	CU	1	1-2				Flew from F7 S
01/04/2011	07.20	07.35	L.	1	1				F7 S
01/04/2011	07.20	07.35	L.	2	1				F7 S
01/04/2011	07.20	07.35	L.	1	1-2				Display then flew N from F7 S
01/04/2011	07.20	07.35	L.	2	1				F7 S
01/04/2011	07.20	07.35	L.	1	1				F7 S
01/04/2011	07.20	07.35	L.	1	1				F4
01/04/2011	07.35	07.50	L.	1	1				Mobbed crow F75
01/04/2011	07.35	07.50	L.	2	1-2				Mobbed crow - occasional rise to 2 before dive at crow F75
01/04/2011	07.35	07.50	L.	1	1				Field 4 " 5
01/04/2011	07.35	07.50	L.	1	1				Mobbed crow F7 s
01/04/2011	07.50	08.05	L.	4	1				Mobbed crow F7 s
01/04/2011	07.50	08.05	L.	1	1				F7 S
01/04/2011	07.50	08.05	L.	8	1				F7 S
01/04/2011	07.50	08.05	L.	1	1-2				F7 S
01/04/2011	07.50	08.05	L.	3	1				F4
01/04/2011	07.50	08.05	OC	3	1-2				Chasing flight over F4, 5 and 7
01/04/2011	08.05	08.20	L.	1	1				F7 N " F7 S
01/04/2011	08.05	08.20	L.	1	1				F7 S
01/04/2011	08.05	08.20	OC	2	1				F7 S
01/04/2011	08.05	08.20	OC	1	1-2				Flew W from F7 S
01/04/2011	08.05	08.20	L.	1	1				F7 S
01/04/2011	08.20	08.35	L.	3	1-2				F4 - occasionally rising > 30m
01/04/2011	08.20	08.35	L.	8	1-2				F7 S 5 birds > 30m for c. 20s
01/04/2011	08.20	08.35	L.	1	1				F4
01/04/2011	08.20	08.35	OC	1	1-2				F7 S
01/04/2011	08.20	08.35	L.	1	1				F7 S
01/04/2011	08.20	08.35	L.	3	1				F7 S
01/04/2011	08.20	08.35	L.	1	1				F7 N

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
01/04/2011	08.20	08.35	L.	2	1				F7 S
01/04/2011	08.20	08.35	L.	1	1				F7 S
01/04/2011	08.35	08.50	L.	1	1-2				F7 S " F7 N
01/04/2011	08.35	08.50	L.	5	1				Mob crow F7 N
01/04/2011	08.35	08.50	L.	6	1-2				F4 and F7 N, 3 birds at 2
01/04/2011	08.35	08.50	CU	1	1-2				Flew W from F7 N
01/04/2011	09.05	09.20	L.	1	1				F4
01/04/2011	09.05	09.20	L.	2	1-2				F4
01/04/2011	09.05	09.20	L.	3	1-2				Briefly at height 2 F7 S
01/04/2011	09.05	09.20	L.	1	1-2				Briefly at height 2 F4
01/04/2011	09.05	09.20	L.	3	1				F4
01/04/2011	09.05	09.20	L.	1	1				F7 S
01/04/2011	09.05	09.20	CO	1	2				Flew SW over F5 and F41
01/04/2011	09.05	09.20	L.	1	1				F4
01/04/2011	09.05	09.20	L.	1	1				F4
01/04/2011	09.05	09.20	OC	1	1				Flew NW across VP
01/04/2011	09.05	09.20	CU	1	1				Flew from NW landed F7 S
01/04/2011	09.20	09.35	L.	10	1-2				F7 S and F7 N, 2 birds displaying at height 2 for 40s
01/04/2011	09.20	09.35	OC	2	2				East over F4 and F7 N
01/04/2011	09.20	09.35	L.	2	1				F4
01/04/2011	09.20	09.35	L.	1	1				F7 S
01/04/2011	09.20	09.35	L.	5	1-2				F7 S and F7 n, 2 at height 2 for 20s
01/04/2011	09.20	09.35	L.	5	1-2				Continuous activity 2 birds at height 2 for c. 50s
01/04/2011	09.20	09.35	OC	2	1				F4
01/04/2011	09.35	09.50	L.	2	2				Continuous display
01/04/2011	09.35	09.50	OC	4	4				Chasing flight over F11 near fields
01/04/2011	09.35	09.50	L.	8	8				Up to 8 birds
01/04/2011	09.35	09.50	L.	2	2				F4
01/04/2011	09.35	09.50	L.	2	2				F7 S
01/04/2011	09.35	09.50	OC	1	1				SW over F7 S
01/04/2011	09.50	10.05	L.	4	1-2				F4

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
01/04/2011	09.50	10.05	L.	4	1-2				Up to 4 display F7S, often at height 2
01/04/2011	10.05	10.20	CU	2	1				F7 S display
01/04/2011	10.05	10.20	CU	2	1				Display F4
01/04/2011	10.20	10.35	OC	4	1				F5 " F7 N
01/04/2011	10.20	10.35	L.	9	1-2				Up to 9 birds in air displaying, often height 2
01/04/2011	10.20	10.35	OC	2	2				Over F7 S
01/04/2011	10.20	10.35	L.	6	1-2				Almost continuous activity, up to 6 birds at height 1 and 2
01/04/2011	10.35	10.50	CU	4	2				Display F4
01/04/2011	10.35	10.50	L.	4	2-1				
01/04/2011	10.50	11.05	CU	2	1				SW over VP
01/04/2011	10.50	11.05	CU	2	1				Display F4
01/04/2011	10.50	11.05	L.	2	2-1				F4
01/04/2011	10.50	11.05	L.	8	1-2				F7 S up to 8 birds continually displaying at height 1 and 2
01/04/2011	10.50	11.05	L.	4	1-2				F4 up to 4 birds continually displaying at height 1 and 2
01/04/2011	10.50	11.05	CU	4	2				West over VP
15/04/2011	14.50	15.05	L.	7					Displaying F7
15/04/2011	14.50	15.05	L.	2					Displaying F4/5
15/04/2011	15.50	16.05	OC	2	1				Flew E chased feral pigeon d<2s
15/04/2011	15.50	16.05	CU	2	1				Displaying
15/04/2011	17.05	17.20	CU	2	2-1				Landed F4
15/04/2011	17.05	17.20	CU	2	1				Same pair as above, display, landed F7
15/04/2011	17.20	17.35	OC	2	1				
15/04/2011	18.20	18.35	CU	2	1				Display, landed F4
15/04/2011	18.20	18.35	OC	1	1-2				Alarming over F6
15/04/2011	18.35	18.50	CU	1	2-1				Display, landed F5
15/04/2011	20.50	21.05	SN	1					Heard drumming SW corner field 7
21/04/2011	10.25	10.40	CU	1	1				Slow undulating display
21/04/2011	10.55	11.10	CU	1	1				Slow undulating display
21/04/2011	11.25	11.40	CU	1	1				
03/05/2011	04.20	04.35	OC						See wader summary

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
03/05/2011	04.20	04.35	L.						See wader summary
03/05/2011	08.50	09.05	GI	2	2				Soaring ♂ imm W of 1km buffer. ♂ diving
03/05/2011	09.05	09.20	CU	3	1				Flew field 1 → land field 6 (not mapped)
08/06/2011	06.55	07.00	L.	1	1	Yes			Flew into field 7 from S : note : 5 ad and 3 brood in field (probably more chicks) 06.59 11s flight 1
08/06/2011	07.00	07.05	L.	1	1	Yes			Into field 7 from W duration 85 flight 2
08/06/2011	07.05	07.10	OC	1	1-2	Yes			Height 12 and 5s then ht2 landed 26s calling excitedly F7
08/06/2011	07.30	07.35	L.	(1)+2	1-2	Yes			1, then 2, L. leave F7 to SW start ht1 quickly to ht 2, duration 1=1m 13s, 2 (2 birds) = 1m32s (circled field 7 ht 2) (3) - flight of 2 birds recorded on VP form
08/06/2011	07.30	07.35	CU	1	1	Yes			Display flight, field 4, duration 8s (4)
08/06/2011	07.35	07.40	OC	2	2(1)	Yes			Pair chasing flight - over fields 5, 6, 7 (not mapped) mainly ht2 occ ht1, left site N end F6
08/06/2011	08.30	08.35	KT	1	3			Yes	Soaring W of 1km buffer (South Buchanty) moved S duration 2m 38 s 08.31
08/06/2011	08.40	08.45	L.	1	2	Yes			Flew N duration 1m21s 08.44
08/06/2011	09.05	09.10	L.	1	1	Yes			Over F7 duration 12s (not mapped) 09.07
08/06/2011	09.20	09.25	OC	2	1-2	Yes			Pair chasing display duration 1m03 - alt ht1 and 2 over F4, 5, 7 not mapped
08/06/2011	09.30	09.35	L.	1	1-2	Yes			Mobbed BH over F7, duration 27s
08/06/2011	11.15	11.20	L.	1	2	Yes			Over F7, alarming (not mapped) duration 17s
08/06/2011	11.25	11.30	OP	1	3-2		Yes	Yes	Duration 2m18s flying NW - shallow glide descent ht3 to ht 2, toward end, lost against hillside
08/06/2011	11.25	11.30	OC	2	1-2	Yes			Chasing flight over F4, 5 and 7 not mapped
08/06/2011	11.45	11.50	CU	1	2	Yes			Duration 1m20s, E flight (9)
08/06/2011	11.50	11.55	OC	2	2	Yes			Duration 40s, flight (10)
08/06/2011	12.10	12.15	L.	1	1,2				F7 duration 22s (display flight - mapped flight (11))
08/06/2011	12.25	12.30	KT	1	3		Yes		NW 1km buffer, duration 2m28s (lost against hillside) flight 12
08/06/2011	13.00	13.05	L.	1	1,2	Yes			F7 duration 13s (not mapped)
21/07/2011	14.10	14.15	OC	1	1	Yes			Field 7
21/07/2011	14.10	14.15	OC	1	1	Yes			Field 7, different bird (probable pair)

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
21/07/2011	15.10	15.15	OC	1	1	Yes			
21/07/2011	15.15	15.20	OC	1	1,2	Yes			Probable pair, possibly same birds as above
21/07/2011	15.25	15.30	OC	1	2	Yes			Probably same as 15.15 bird
21/07/2011	18.40	18.45	OC	1	1	Yes			Field 7
28/08/2011	09.10	09.15	OC	2	1	Yes			

Table A2.3 Secondary Species

Species Code	Species	Species Code	Species
BZ	Common Buzzard	SH	Sparrowhawk
K.	Kestrel	BH	Black Headed Gull
CM	Common Gull	GB	Greater Black-backed Gull
LB	Lesser Black-backed Gull	HG	Herring Gull
MA	Mallard	CG	Canada Goose

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
28/01/2011	08.00	08.15	BZ	1	2				
28/01/2011	09.00	09.15	BZ	1	3				
28/01/2011	11.45	12.00	RN	3	2				
04/02/2011	10.30	10.45	BZ	1	2				Landed on usual tree
14/02/2011	14.35	14.50	BZ	1	2				
27/02/2011	11.40	11.55	BZ	1	1				Harassed by crow
27/02/2011	11.40	11.55	BZ	1	2-3				Display to N of site
27/02/2011	12.10	12.25	BZ	1	2-3-2				In S of site
27/02/2011	12.10	12.25	BZ	1	2-3				In W of site, hanging on wind
27/02/2011	12.40	12.55	K.	1	1-2-3-2-1				

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
27/02/2011	12.40	12.55	BZ	1	2				To perch on pylon
27/02/2011	12.55	13.10	BZ	1	1				Same bird, flew off
27/02/2011	12.55	13.10	BZ	1	3				Different bird
27/02/2011	13.10	13.25	BZ	4	3				Territorial dispute 2 pairs W
27/02/2011	13.25	13.40	BZ	1	3-2				Southerly bird
27/02/2011	14.10	14.25	BZ	1	2-1-2-3				In east of site
27/02/2011	14.25	14.40	BZ	2	3				Displaying to 3rd bird at lower band
27/02/2011	14.25	14.40	BZ	1	2				
27/02/2011	14.40	14.55	BZ	2	3				East pair
27/02/2011	14.55	13.10	BZ	2	2				South pair
27/02/2011	14.55	13.10	BZ	1	2-1				Hunting
27/02/2011	14.55	13.10	BZ	1	1-2-1				Hunting - different bird
27/02/2011	15.10	15.25	BZ	2	2-1				NE pair
27/02/2011	15.25	15.40	BZ	1	2-3-2				S bird
27/02/2011	15.40	15.55	BZ	2	3				E pair
27/02/2011	15.40	15.55	BZ	2	2-3				W pair
27/02/2011	15.55	16.10	BZ	3	2-3-2				W pair + 1 prob intruder
03/03/2011	14.10	14.25	BZ	1	1				In E
03/03/2011	14.55	15.10	BZ	1	1				in W
03/03/2011	14.55	15.10	BZ	1	1-2				Same bird as above
03/03/2011	15.10	15.25	BZ	1	1				Flew to perch to join second bird E
28/03/2011	16.05	16.20	BZ	1	2				
28/03/2011	16.20	16.35	BZ	1	1				
28/03/2011	16.50	17.05	BZ	2	2-1				1 bird landed in field 7
28/03/2011	16.50	17.05	BZ	1	3				
28/03/2011	17.35	17.50	RN	1	1-2				Landed on pylon
28/03/2011	18.05	18.20	K.	1	2-1				Hovering at A
28/03/2011	18.35	18.50	SH	1	2				Flew N over site - mobbed by K.
28/03/2011	18.35	18.50	K.	1	2				Mobbed SH
01/04/2011	06.50	07.05	MA	2	1				
01/04/2011	07.05	07.20	MA	3	1				

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
01/04/2011	07.20	07.35	BH	1	1				Landed F7 N
01/04/2011	07.20	07.35	MA	2	1				Landed F7 S
01/04/2011	07.35	07.50	MA	1	1				Landed F7 S
01/04/2011	07.35	07.50	MA	2	1				Flight across F7 " F5
01/04/2011	07.50	08.05	MA	4	1-2				F7 S " F4
01/04/2011	08.05	08.20	MA	1	1				Landed F7 S
01/04/2011	08.05	08.20	MA	1	1				Landed F7 S
01/04/2011	08.05	08.20	BH	9	2				Flew NW
01/04/2011	08.05	08.20	MA	1	1-2				Flew W from field 5
01/04/2011	08.35	08.50	MA	1	1				
01/04/2011	09.05	09.20	MA	4	2				
01/04/2011	09.20	09.35	MA	1	1				N over F8
01/04/2011	09.20	09.35	MA	1	1				Flew from wetland in F7 S
01/04/2011	09.35	09.50	LB	1	1				Flew W over site
01/04/2011	09.35	09.50	BZ	1	1				Flew W from plantation F2
01/04/2011	09.35	09.50	BH	5	5				Flying E over site
01/04/2011	09.50	10.05	BZ	1	1				Over plantation S of F7
01/04/2011	09.50	10.05	MA	1	2				West over F2
01/04/2011	10.05	10.20	BZ	1	1				Flew into conifers W of VP
01/04/2011	10.05	10.20	MA	2	1				NW over F5
01/04/2011	10.20	10.35	RN	1	2				Over F10
01/04/2011	10.20	10.35	MA	1	1				East over F7 S
01/04/2011	10.50	11.05	MA	1	2-1				SW over F4
27/02/2011	15.50	15.55	RN	2	1		Yes		
15/04/2011	14.50	15.05	RN	1	1				Landed field 6
15/04/2011	14.50	15.05	BZ		1-2				W to SW over site
15/04/2011	14.50	15.05	SH		2				Followed until dived at GI below
15/04/2011	15.35	15.50	SH	1	1				♀ chasing Lapwing - perched on post at N of F4 for 37 minutes
15/04/2011	16.05	16.20	SH	1					♀ back on fencepost N side F4
15/04/2011	16.50	17.05	BZ	1	1				N over core site
15/04/2011			CM		1				Landed F4

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
15/04/2011	17.20	17.35	BH	2	2				S across site
15/04/2011	18.20	18.35	BZ	1	1				Flew SW
15/04/2011	18.20	18.35	BH	8	2				S over site
15/04/2011	18.20	18.35	RN	1	1				W across site
15/04/2011	18.35	18.50	CM	1	1				Flew short distance and landed F4
15/04/2011	18.35	18.50	RN	2	2				E across site
15/04/2011	18.50	19.05	LB	2	1				W across site
15/04/2011	18.50	19.05	BH	1	1				S over
15/04/2011	19.35	19.50	BH	2	2				N over site
15/04/2011	19.50	20.05	BZ	1	1				Low over F10, landed in tree
15/04/2011	20.20	20.35	BZ	1	1				S over F6 and F7
21/04/2011	09.40	09.55	RN	1	1				Briefly harassed GI
21/04/2011	10.10	10.25	CG	2	1				Seen briefly, disappeared behind trees
21/04/2011	12.10	12.25	RN	1	3				Very high display calling
21/04/2011	12.10	12.25	BZ	1	3				In far SW
21/04/2011	12.25	12.40	BZ	1	1				Flew off to trees from feeding on ground
21/04/2011	13.10	13.25	BZ	1	3				Very high sky-diving display over centre of site
									Very high sky-diving display over centre of site, series of massive dives at end
21/04/2011	13.25	13.40	BZ	1	1-2-3				Pair in far W
21/04/2011	13.40	13.55	BZ	2	3				One of a pair
21/04/2011	13.40	13.55	BZ	1	1-2				Feeding F6 (mainly) and F7
03/05/2011	04.20	04.35	BH	84					Drumming and chipping, heard F5
03/05/2011	04.20	04.35	SN	1					Flew W to S to VP (1km buffer)
03/05/2011	04.50	05.05	H.	1	2				Flying SW over site
03/05/2011	05.35	05.50	HG	1	2				Flying E, S of VP, 1km buffer
03/05/2011	05.50	06.05	SH	1	1				East over 1km buffer
03/05/2011	06.20	06.35	LG	2	2				E over site, circled N 1km buffer
03/05/2011	06.50	07.05	LG	3	3-2				Soaring and gaining height, lost at great height
03/05/2011	07.05	07.20	BZ	1	3				Flew NW - soaring seen when following GI
03/05/2011	08.20	08.35	BZ	1	3				Soaring at height, occasionally undulating display flight
03/05/2011	08.35	08.50	BZ	2	3				

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
03/05/2011			BZ	1					
03/05/2011	09.05	09.20	BH	4	2				Flying W over N 1km buffer
03/05/2011	09.50	10.05	BZ	1	2				West edge 1km buffer
03/05/2011	09.50	10.05	BZ	1	2				S of VP, 500m buffer
03/05/2011	10.05	10.20	BZ	1	2-3				
03/05/2011	10.05	10.20	BZ	2	2-3				Bird displaying / soaring - 2nd bird present also displaying
03/05/2011	10.20	10.35	BZ	1	2				Soaring/displaying to E of VP
03/05/2011	10.35	10.50	BZ	3	2-3				Soaring NW 1km buffer drifted NW
03/05/2011	10.35	10.50	BZ	2	2				Soaring height 3 E of VP 500m buffer
03/05/2011	11.05	11.20	BH	45	2-3				Disturbed by microlite - circled at height drifted W
									Feeding over ploughed fields - low 'gleaning' flight and landing (fields 4 & 41)
08/06/2011	06.45	06.50	BH	4	1	Yes			
08/06/2011	07.05	07.10	BH	3	1	Yes			Now 3 BH field 4
08/06/2011	07.30	07.35	BH	3	1	Yes			Left site towards E duration 58s
08/06/2011	07.35	07.40	BH	4	1	Yes			4 on to F4 from N, forage ht 1/ground
08/06/2011	07.50	07.55	MA	1	1	Yes			Flew field 7 to F5 duration 5s (5)
08/06/2011	07.50	07.55	BZ	1	2		Yes		SE of VP over Gorthy Wood dur 2m 28s
08/06/2011	08.00	08.05	KT	1	2		Yes	Yes	Soaring N of 1km buffer, dur 58s moving E
08/06/2011	08.00	08.05	BZ	1	0-2	Yes			Perched edge field 4 08.16 flew S ht2 dur 42s
08/06/2011	08.05	08.10	BH	6	0-1	Yes			6 foraging plough F4 and F5
08/06/2011	08.20	08.25	BZ	1	1	Yes			S across site carrying prey dur 32s
08/06/2011	08.30	08.35	K.	1	2			Yes	Hovering W of 1km buffer not timed
08/06/2011	08.40	08.45	BZ	2	2		Yes		2 soaring E of VP (500m buffer) 1 BZ from 3m39 to total 4m21s
08/06/2011	08.40	08.45	BH	5	1	Yes			5 field 4
08/06/2011	09.00	09.05	BZ	2	2		Yes		Soaring over wester 1km buffer 09.00 dur 1m04
08/06/2011	09.00	09.05	BZ	1	2	Yes			N over site 09.03 duration 2m47s
									12 over ploughed fields - now continual movement BS to/from W - mainly ht 1m, occ ht2
08/06/2011	09.10	09.15	BH	12	1	Yes			
08/06/2011	09.30	09.35	BZ	1	2		Yes		Over W buffer (500m) dur 1m31s

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
08/06/2011	10.45	10.50	BH	14	1	Yes			14 feeding on ploughed areas (field 4 and 5) - continual BH movement to/from W throughout (not timed)
08/06/2011	10.45	10.50	LG	3	2	Yes			W over site, dur 2m12s
08/06/2011	10.50	10.55	BH	8	1	Yes			Feeding over fields 4 and 5
08/06/2011	10.55	11.00	BH	8	1	Yes			Feeding over fields 4 and 5
08/06/2011	11.00	11.05	BH	10	1	Yes			Feeding over fields 4 and 5
08/06/2011	11.05	11.10	BH	11	1	Yes			Feeding over fields 4 and 5
08/06/2011	11.10	11.15	BZ	1	2		Yes		Over Gorthy Wood, S of VP (500m buffer) Dur 2m32s
08/06/2011	11.10	11.15	BZ	1	2		Yes		W of VP (500m buffer) joined by 2nd bird + 6m20s, total 11m27s
08/06/2011	11.10	11.15	BH	6		Yes			F4 and 5
08/06/2011	11.15	11.20	BZ	1	2		Yes		Gorthy Wood, dur 1m20s (circa)
08/06/2011	11.15	11.20	BH	7	1	Yes			F4 and 5
08/06/2011	11.20	11.25	BH	7	1	Yes			F4 and 5
08/06/2011	11.25	11.30	LG	1	2	Yes			W not timed
08/06/2011	11.40	11.45	RN	3	3		Yes		W over 1km buffer N 3m12s
08/06/2011	11.40	11.45	BH	10	1	Yes			F4 and 5
08/06/2011	11.50	11.55	BZ	2	3-2		Yes		Dur 5m24s ht 3 to 2, 4m40s N 1km buffer
08/06/2011	11.50	11.55	BH	3	1	Yes			F4 and 5
08/06/2011	12.00	12.05	BZ	1	2		Yes		SE of VP 500m buffer duration 4m40s
08/06/2011	12.00	12.05	BH	5	1	Yes			F4 and 5
08/06/2011	12.05	12.10	LG	2	2	Yes			W over site dur 2m20s
08/06/2011	12.05	12.10	BZ	1	3		Yes		N 1km - 500m buffer, dur 6m45s - moved E
08/06/2011	12.10	12.15	BH	7	1	Yes			F4
08/06/2011	12.10	12.15	RN	3	3		Yes		SE 1km buffer dur 57s
08/06/2011	12.20	12.25	CM	1	1	Yes			Flew field 4 from 4 dur 7s
08/06/2011	12.20	12.25	BH	10	1	Yes			F4 and F5 (2F5)
08/06/2011	12.25	12.30	BZ	2	3		Yes		Soaring N 1km buffer, dur 2m20s
08/06/2011	12.25	12.30	BZ	8				Yes	4 soaring to N and 4 soaring to N (not timed)
08/06/2011	12.35	12.40	BH	13	1	Yes			F4 and F5 (2F5)
08/06/2011	12.35	12.40	CM	3	1	Yes			F4
08/06/2011	12.40	12.45							Gulls as above

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
08/06/2011	12.45	12.50							Gulls as above
08/06/2011	12.50	12.55	BZ	1	1	Yes			S over site, dur 28s
08/06/2011	13.00	13.05	BH	15	1	Yes			F4
08/06/2011	13.00	13.05	CM	2	1	Yes			F4
08/06/2011	13.05	13.10	BZ	1	2	Yes			E of VP 500m buffer and F10 dur 1m
08/06/2011	13.10	13.15	BZ	2	3		Yes		E of VP 500m buffer dur 3m13s - drifted E
08/06/2011	13.10	13.15	BZ	1	2		Yes		S of VP 500m buffer dur 30s
08/06/2011	13.20	13.25	BZ	1	1				S of VP 500m buffer dur 41s
08/06/2011	13.20	13.25	BZ	1	3	Yes	Yes		Over F7 - east to 500m buffer dur 5m14s
08/06/2011	13.20	13.25	BH	1	1	Yes			F5
08/06/2011	13.25	13.30	BZ	1	2		Yes		At W of 500m buffer - 1km buffer dur 59s
08/06/2011	13.35	13.40	CU	1	2	Yes			W over site landed F1 dur 48s
08/06/2011	13.35	13.40	BZ	1	1	Yes			S over F5 to Gorthy Wood dur 22s
08/06/2011	13.40	13.45	BH	8	1	Yes			F4 and 1 F5
08/06/2011	13.40	13.45	CM	1	1	Yes			F5
08/06/2011	13.40	13.45	BZ	1	3		Yes		Soaring NW 1km buffer > 5mins
									Constant movement of single birds and flocks of up to 4 birds moving across site from E to W. They occasionally would drop to the ground to forage as they passed.
14/06/2011	16.30		BH	1	1	Yes	Yes	Yes	An average of 1 flight every 10 minutes. In addition, a small flock of varying numbers was foraging in field 4 throughout survey
14/06/2011	16.30		CM	1	1	Yes			Constant presence of at least 4 birds in field 4 throughout survey
14/06/2011	16.30		BZ	1	2	Yes	Yes		Constant activity involving up to 6 birds, mainly hunting over buffer zones to S and E of the site but also over fields 6 and 7 regularly
14/06/2011	18.10	18.15	SH	1	2	Yes			Came out of trees in buffer zone mobbed by hirundines then crossed site gaining height and circling as it went
14/06/2011	18.30	18.35	LB	1	3	Yes	Yes	Yes	Circling slowing across the site then lost to view
14/06/2011	19.25	19.30	CM	1	1	Yes			Flew through field 7 to field 4
14/06/2011	12.30	12.50	BH	1	1	Yes			Foraging in field 5

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
14/06/2011	12.30	13.30	BZ	1	2	Yes	Yes		Up to 3 birds hunting on the site and in buffer zones, occasionally alighting on trees and pylons
14/06/2011	12.30	13.30	BH	1	1	Yes			Up to 8 birds foraging in field 4 and field 1
14/06/2011	12.30	13.30	CM	1	1	Yes			Up to 4 birds foraging in field 4 and field 1
14/06/2011	12.40	12.45	BH	1	2	Yes	Yes	Yes	Flew through site
14/06/2011	13.20	13.25	BH	4	3	Yes	Yes	Yes	Flew through site calling
14/06/2011	13.35	13.40	BZ	1	1	Yes	Yes	Yes	Flew through being mobbed by crows
14/06/2011	13.45	13.50	CM	1	1	Yes			Foraging in field 7
14/06/2011	13.50	13.55	BZ	1	1	Yes	Yes		Flew into site and then into plantation in buffer zone
14/06/2011	14.00	14.05	BH	1	3	Yes	Yes	Yes	Flew through high up calling
14/06/2011	14.10	14.15	BZ	1	2	Yes			Hovering and soaring
14/06/2011	14.50	14.55	LB	1	3	Yes	Yes	Yes	Flew over site then soared up and out of view
14/06/2011	15.05	15.10	BH	3	2	Yes	Yes	Yes	Flew through calling
14/06/2011	15.10	15.15	LB	1	1	Yes			Dropped into field 6
14/06/2011	15.25	15.30	SH	1	3	Yes			Soaring and being mobbed by hirundines
14/06/2011	13.30	15.30	BH	1	1	Yes			Continuous presence of up to 8 birds in field 4
14/06/2011	13.30	15.30	CM	1	1	Yes			Continuous presence of up to 4 birds in field 4
									Hunting and soaring activity throughout survey involving up to 6 birds, particularly active in S and E buffer zones and field 6
14/06/2011	13.30	15.30	BZ	1	2	Yes	Yes		Flew in and landed in field 7
27/06/2011	09.35	09.40	BH	2	1	Yes			Flew through
27/06/2011	09.40	09.45	HG	2	1	Yes	Yes		Flew from field 6 to field 7 and landed
27/06/2011	09.45	09.50	CM	1	1	Yes			Flew from field 7 to field 41 and foraged there
27/06/2011	10.00	10.05	BH	1	1	Yes			Birds in field 7 flew off
27/06/2011	10.20	10.25	BH	2	1	Yes	Yes		Flew through then returned to forage various fields
27/06/2011	10.25	10.30	CM	2	1	Yes	Yes		Flew from field 7 to field 6
27/06/2011	10.35	10.40	CM	1	1	Yes			Foraging in field 41 then landed
27/06/2011	11.00	11.05	BH	1	1	Yes			Flew through
27/06/2011	11.05	11.10	CM	1	1	Yes	Yes		Landed in tree in E buffer zone
27/06/2011	11.10	11.15	BZ	1	1	Yes	Yes		Flew to tree at far end of field 7
27/06/2011	11.15	11.20	BZ	1	1	Yes	Yes		Flew over
27/06/2011	11.20	11.25	BZ	1	1		Yes		

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
27/06/2011	11.25	11.30	BZ	1	1	Yes			Flew into field 7 and landed on a fencepost
27/06/2011	11.35	11.40	CM	1	2	Yes	Yes		Flew through
27/06/2011	11.35	11.40	BH	1	1	Yes			Flew into field 41
27/06/2011	11.45	11.50	LB	1	1	Yes	Yes		Flew through
27/06/2011	11.50	11.55	BH	1	1	Yes			Flew into field 7 and landed (juv)
27/06/2011	13.30	13.35	CM	1	1	Yes			Flew in and landed in field 7
27/06/2011	13.35	13.40	BZ	2	1		Yes		Flew off calling
27/06/2011	13.45	13.50	BH	1	1	Yes			Flew from field 7 to 41
27/06/2011	13.55	14.00	BZ	1	1		Yes		Hunting
27/06/2011	13.55	14.00	CM	1	1	Yes			Flew around field 7 then landed
27/06/2011	14.00	14.05	CM	1	1	Yes			Flew from field 41 to field 4
27/06/2011	14.00	14.05	BZ	1	1		Yes		Flew onto pylon
27/06/2011	14.05	14.10	CM	1	1	Yes			Flew from field 4 to field 7
27/06/2011	14.10	14.15	CM	1	1	Yes			Flew from field 7 to field 6
27/06/2011	14.20	14.25	BH	1	1	Yes			Flew from field 4 to field 41
27/06/2011	14.20	14.25	BH	1	2	Yes	Yes		Flew from field 41 to field 7 then off to distance
27/06/2011	14.40	14.45	BZ	1	1		Yes		Soaring then flew off
27/06/2011	14.40	14.45	BH	1	1	Yes			Flew through field 41 to 7 and back again
27/06/2011	14.40	14.45	BH	6	1	Yes			Small flock foraging in field 4
27/06/2011	14.45	15.00	BH	3	1	Yes			Flew from field 4 to field 7
27/06/2011	14.45	15.00	CM	1	1	Yes	Yes		Flew through
27/06/2011	14.45	15.00	BH	4	1	Yes			Flew from field 4 to field 7
27/06/2011	14.45	15.00	BH	7	1	Yes	Yes		Foraging in field 7 then flew off
27/06/2011	14.55	15.00	BH	1	1	Yes	Yes		Flew through
27/06/2011	14.55	15.00	BZ	1	2		Yes		Hunting
27/06/2011	14.55	15.00	BH	1	1	Yes			Flew from field 7 to field 41 and foraged there
27/06/2011	15.00	15.05	LB	1	1	Yes			Landed in field 6
27/06/2011	15.15	15.20	CM	1	1	Yes			Foraging in field 7 then flew off
27/06/2011	15.20	15.25	BH	1	1	Yes	Yes		Flew through and ligned in field 41 on way
27/06/2011	15.35	15.40	BH	2	2	Yes	Yes		Flew through
27/06/2011	15.40	15.45	BH	1	1	Yes			Flew from field 4 to 41

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
27/06/2011	15.45	15.50	CM	1	1	Yes			Foraging in field 41
27/06/2011	15.45	15.50	CM	1	1	Yes			Flew in and landed in field 7
27/06/2011	15.45	15.50	CM	1	1	Yes			Flew from field 7 to 41 to forage
27/06/2011	15.50	15.55	BH	1	1	Yes			Flew from field 41 to 7 and then 6
27/06/2011	16.00	16.05	LB	1	1	Yes	Yes		Flew from field 6 to 7 then off to distance
27/06/2011	16.05	16.10	BH	1	1	Yes			Flew from field 41 to 7 and back again
27/06/2011	16.05	16.10	BH	1	1	Yes			Flew from field 7 to 41
27/06/2011	16.10	16.15	LB	1	1	Yes			Flew in and landed in field 4
27/06/2011	16.20	16.25	BH	1	1	Yes			Foraging in field 7
11/07/2011	06.45	06.50	BZ	2	1	Yes			Very vocal pair of birds calling back and forth to each other, one perched briefly in trees between fields 2 and 5
11/07/2011	07.10	07.15	K.	1	2	Yes	Yes		Flew across field 7 and 6 and on towards 20
11/07/2011	07.20	07.25	BZ	1	1	Yes	Yes		Feeding in field 7 then flew and perched in buffer zone
11/07/2011	09.00	09.05	BZ	1	2	Yes			Briefly over wood between fields 2 and 5, then drifted off
11/07/2011	09.05	09.10	BZ	1	3		Yes		Hunting
11/07/2011	09.25	09.30	BZ	1	1	Yes			Briefly circled over wood between fields 2 and 5
11/07/2011	09.25	09.30	RN	1	3		Yes	Yes	Circling then flew off
11/07/2011	09.35	09.40	BZ	2	1	Yes			Chased out of wood between 2 and 5 by corvids
11/07/2011	09.40	09.45	SH	1	1	Yes	Yes		Flew past VP up to farm, perched on fence then flew off ♀
11/07/2011	10.20	10.25	RN	4	3	Yes	Yes		Flew over calling
11/07/2011	10.25	10.30	LB	1	3	Yes	Yes		Flew over calling
11/07/2011	10.35	10.40	BZ	1	1	Yes	Yes		Flew low and then out of sight
11/07/2011	10.40	10.45	LB	1	1	Yes	Yes	Yes	Flew from field 7 to field 6 then off to distance
11/07/2011	11.00	11.05	BZ	1	1		Yes		Mobbed by corvids and landed in a tree
11/07/2011	11.05	11.10	BZ	1	2		Yes		Hunting
11/07/2011	11.10	11.15	RN	2	3		Yes		Flew through
11/07/2011	11.35	11.40	SH	1	1	Yes	Yes		Flew into field 5 where it foraged then continued on to commute between 7 and 5 before flying off west
11/07/2011	12.30	12.35	BZ	1	1		Yes		Low over forestry

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
11/07/2011	12.45	12.50	RN	2	1	Yes			Adult and juvenile foraging in field 6, then flew to pylon in field 7, then flew to ground and killed a rook. Juvenile was chased off by other rooks for a time then rejoined adult at site of kill in field 7
21/07/2011	15.15	15.20	BZ	1	1	Yes			Plantation B
21/07/2011	15.45	15.50	BZ	1	1,2	Yes			Plantation A
21/07/2011	18.50	18.55	BZ	1	1,2	Yes			Plantation 3
08/08/2011	12.45	15.45	LB	30	1	Yes			Flock of c. 40 LB in field 7 consisting of adults and juveniles. Frequent short flights took place at height 1 across field 7
08/08/2011	12.45	15.45	GB	4	1	Yes			Up to 6 GB with LB flock with similar behaviour
08/08/2011	13.00	13.05	RN	2	1	Yes			3 flew into back of field 7 and gradually moved along fence line tumbling then landed in trees in eastern buffer zone, probably family party, repeated behaviour 3 times
08/08/2011	13.15	13.20	RN	4	2		Yes		
08/08/2011	13.20	13.25	K.	1	1	Yes			Low over back of field 7, harried by gulls and corvids ♀
08/08/2011	13.25	13.30	K.	1	1	Yes	Yes		♀ again tried to hunt edge of field 7 but drove off north by corvids
08/08/2011	13.30	13.35	BZ	1	3		Yes		Hunting
08/08/2011	13.30	13.35	RN	1	2		Yes		Tumbling and flying over plantation in buffer zone again
08/08/2011	13.45	13.50	RN	1	1		Yes		Tumbling and flying over plantation in buffer zone again
08/08/2011	13.50	13.55	RN	2	2	Yes	Yes		Flew up over field 7 to buffer zone on douth of site, perched then dropped into field 7 to forage
08/08/2011	14.05	14.10	BZ	1	1		Yes		Brief flight
08/08/2011	14.15	14.20	BZ	1	1	Yes	Yes		Hunting edge of field 7 then off south
08/08/2011	14.20	14.25	RN	4	1	Yes	Yes		Flew from corner of field 7 out towards plantation in eastern buffer zone
08/08/2011	14.20	14.25	BZ	1	3		Yes		Hunting
08/08/2011	14.30	14.35	BZ	1	1	Yes			Juvenile being mobbed by raven and calling between field 5 and 2
08/08/2011	14.30	14.35	RN	1	1	Yes	Yes		Mobbing juvenile BZ before flying off west
08/08/2011	14.35	14.40	K.	1	1	Yes			Hunting on edge of field 6
08/08/2011	14.45	14.50	BZ	1	3		Yes		Hunting
08/08/2011	15.05	15.10	RN	1	3	Yes	Yes	Yes	Flew across field 1 and off to north
08/08/2011	15.15	15.20	RN	4	2		Yes		Flew up from plantation in eastern buffer zone then landed again

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
08/08/2011	15.25	15.30	K.	1	2		Yes		Hunting on north of field 6
08/08/2011	16.45	19.45	LB	30	1	Yes	Yes		Flock of c. 40 birds foraging and loafing in field 7, frequent short flights across field at low level
08/08/2011	16.45	19.45	GB	4	1	Yes	Yes		Up to 6 birds mixed in with above flock with similar behaviour. Both flocks lost and gained birds throughout survey.
08/08/2011	16.45	16.50	BZ	1	3		Yes		Hunting
08/08/2011	17.05	17.10	RN	2	2		Yes		Flying over plantation in eastern buffer zone
08/08/2011	17.20	17.25	BZ	1	1	Yes	Yes		Flew into field 7 and landed on the ground
08/08/2011	17.40	17.45	BZ	1	1	Yes			Flew short distance across field 7
08/08/2011	17.45	17.50	BZ	1	3		Yes		Hunting
08/08/2011	18.30	18.35	RN	1	1	Yes			Landed on fence in field 7
28/08/2011	09.45	09.50	K.	1	1,2	Yes			
28/08/2011	09.50	09.55	K.	1	2	Yes			
28/08/2011	09.50	09.55	BZ	1	1,2	Yes			
28/08/2011	09.50	09.55	RN	1	1,2	Yes			
28/08/2011	10.10	10.15	RN	1	2		yes		
28/08/2011	10.25	10.30	MA	1	2	Yes			
28/08/2011	09.50	09.55	RN	1	2		Yes		BZ and Rn fighting up and down behind conifers, RN quickly gave up
28/08/2011	13.10	13.15	RN	2	2		yes		
28/08/2011	10.40	10.45	K.	1	1,2	Yes			
28/08/2011	10.40	10.45	K.	1	1,2	Yes			
28/08/2011	10.45	10.50	BZ	2	2	Yes			
28/08/2011	10.45	10.50	BZ	2	2,3	Yes			
28/08/2011	11.20	11.25	K.	1	1,2	Yes			
28/08/2011	11.45	11.50	BZ	1	1,2,3	Yes			
28/08/2011	13.10	13.15	RN	2	1,2	Yes			
28/08/2011	13.20	13.25	BZ	1	1		Yes		
28/08/2011	13.20	13.25	BZ	1	1		Yes		
28/08/2011	13.25	13.30	RN	1	1,2	Yes			

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
28/08/2011	13.35	13.40	K.	1	1,2	Yes			
28/08/2011	13.50	13.55	CG	8	2	Yes			
28/08/2011	14.55	14.40	K.	1	1,2	Yes			
28/08/2011	15.25	15.30	BZ	1	1	Yes			
28/08/2011	15.45	15.50	K.	1	1	Yes			
21/07/2011	15.45	15.50	BZ	1	3	YES			in trees, Plantation A
21/07/2011	15.10	15.15	BZ	1	2	YES			Juv moving from tree to tree in plantation B
21/07/2011	18.50	18.55	BZ	1	3	YES			Juvenile - plantation B
28/08/2011	13.50	13.55	CG	1	2	yes			
28/08/2011	9.45	09.50	K.	1	2	yes			Hunting/hovering
28/08/2011	9.50	09.55	K.	1	2	yes			Probably same bird as 2.
28/08/2011	10.40	10.45	K.	1	2	yes			Hunting low in wind
28/08/2011	10.40	10.45	K.	1	2	yes			
28/08/2011	11.20	11.25	K.	1	2	yes			Keeping low
28/08/2011	13.35	13.40	K.	1	2	yes			Hunting/hovering
28/08/2011	14.55	15.00	K.	1	2	yes			Hovering frequently at fairly low levels
28/08/2011	15.45	15.50	K.	1	1	yes			
03/05/2011	4.35	04.40	MA	2	1				
03/05/2011	5.05	05.10	MA	1	1	yes			Female
03/05/2011	6.30	06.35	MA	2	2	yes			Height 1 at end (landing)
08/06/2011	7.50	07.55	MA	1	1	yes			
14/06/2011	13.00	13.05	MA	2	1	yes			Landed in field 7 in damp area
08/08/2011	18.20	18.25	MA	1	1	yes			Female flew across field 7
28/08/2011	10.25	10.30	MA	1	2	yes			Fast direct flight
04/02/2011	11.20	11.25	SH	1	1	yes			Female
04/02/2011	11.40	11.45	SH	1	2	yes			Female
04/02/2011	11.50	11.55	SH	1	1	yes			Female
14/02/2011	12.55	13.00	SH	1	1	yes			Male
03/03/2011	14.50	14.55	SH	1	1	yes			Landed on fencepost/hunting low
03/03/2011	16.55	17.00	SH	1	2	yes			
10/12/2011	10.30	10.35	BZ	1	1	YES			LANDED IN TREE IN BUFFER BY FIELDS

Date	Start Time	End Time	Species	Min. no	Height	On-site	Buffer	Beyond	Notes
10/12/2011	10.40	10.45	BZ	1	2	YES			SAME BIRD AS ABOVE
10/12/2011	11.30	11.35	BZ	1	1	YES			
10/12/2011	11.45	11.50	BZ	1	1	YES			LANDED IN TREE IN BUFFER
10/12/2011	12.25	12.30	RN	1	2	YES			
10/12/2011	12.25	12.30	RN	1	1	YES			LANDED ON SITE, FIELD 7
10/12/2011	12.25	12.30	RN	1	1	YES			SAME BIRD AS ABOVE
10/12/2011	13.40	13.45	RN	1	1	YES			
10/12/2011	13.50	13.55	RN	1	2	YES			
10/12/2011	14.25	14.25	BZ	1	1	YES	YES		LANDED IN BUFFER
10/12/2011	15.00	15.05	RN	2	2	YES	YES		
10/12/2011	15.45	15.55	RN	2	2	YES	YES		
10/12/2011	15.50	15.55	RN	2	1	YES	YES		
10/12/2011	15.55	16.00	RN	1	1	YES	YES		LANDED ON PYLON
10/12/2011	15.55	16.00	RN	1	1	YES	YES		SAME BIRD AS ABOVE
11/12/2011	08.10	08.15	BZ	2	2		YES		
11/12/2011	08.15	08.20	RN	1	2	YES	YES		
11/12/2011	10.05	10.10	RN	1	1		YES		
11/12/2011	10.05	10.10	RN	1	1		YES		
11/12/2011	10.10	10.15	RN	1	1		YES		
11/12/2011	10.25	10.30	HG	1	2	YES	YES		
11/12/2011	12.05	12.10	BZ	1	1	YES	YES		LANDED IN PLANTATION
11/12/2011	12.25	12.30	BZ	1	1		YES		
11/12/2011	13.35	13.40	BZ	1	1	YES	YES		LANDED IN PLANTATION

Table A2.4 Raptor Survey Data

Date	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow	Notes
24/04/2011	05.10	09.00	2-3	WSW	0	0		2			

Table A2.5 Breeding Bird Survey Data

Date	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow	Notes
13/04/2011	06.00	11.00	0-3-5	SSW	1-0	8					Generally overcast and quite cold Lapwing nests fields 4 and 7
26/05/2011	04.10	09.05	1	W-SW		7-6-5-4	2	2			
16/06/2011	04.50	09.35				6-7-8	2	2			
05/07/2011	04.35	08.40	2	W		7-6-5	2	2			No disturbance

Table A2.6 Black Grouse Survey Data

Date	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow	Notes
21/04/2011	04.45	06.30	1	S	1	8	2	2			Total of 33 lekking ♂ black grouse and 3 ♀ Watched from road, lek around 500m to NW from VP 2 short-eared owls seen c. 600m to N of lek, close to road

ANNEX 3: COLLISION RISK MODEL

Introduction

The following Collision Risk Model has been undertaken in relation to the single turbine wind energy Project proposed at Drummick and potential impacts on target species considered vulnerable to collision impacts.

Methodology

Two separate models based on the SNH Collision Risk Model (CRM), as described in Band *et al* (2007), are used to calculate the potential Collision Risk of target species based on flight data. Each model incorporates details bird biometrics, bird behaviour and turbine specifications.

Model 1- Directional: Model used to calculate the Collision Risk of greylag geese and pink-footed geese within the survey area.

Model 2- Non- directional: Model used to calculate the Collision Risk of all sensitive raptor species identified including: red kite and goshawk within the survey area.

Natural and Physical Parameters

Model 1

The dimensions of the proposed turbine are 50m hub height with a 48m rotor diameter; however, this may be subject to change. Therefore a precautionary Collision Risk Window (CRW) was applied to incorporate 200m either side of the turbine and between ground level and 150m.

The cross sectional area	W = width x height
	W = 400m x 150m
	W = 60,000m²

It is then necessary to calculate the area presented by the wind turbine rotors (A). The following equation is used.

$A = N \times \pi R^2$ (where N is the number of rotors and R is the rotor radius)

$$A = 3 \times \pi 24^2$$

$$A = 3 \times 1809.8$$

$$\mathbf{A = 5429.4}$$

This is then expressed as the total rotor area as a proportion A / W of the CRW:

$$\mathbf{5,429.4 / 60,000 = 0.09}$$

The total available number of daylight hours from the period September to April (inclusive) was calculated. This was then increased by 25% to allow for any flights which may take place in the hours of darkness (Lucas *et al* 2007). A reduction of 15% was then applied for turbine downtime (i.e. when the rotor blades are not operational).

Month	Daylight Hours	+25% (Night flights)	- 15% turbine down time
January 2011	236	295.00	250.75
February 2011	266	332.50	282.63
March 2011	367	458.75	389.94
April 2011	427	533.75	453.69
September 2011	383	478.75	406.94
October 2011	322	402.50	342.13
November 2011	246	307.50	261.38
December 2011	216	270.00	229.50

Table A1 Number of Estimated Flight Hours January 2011 to December 2011

Number of hours geese are potentially active during 2011 (T) = **2616.94**

Model 2: All Raptor species used in Model 2 are generally diurnal and are therefore not considered to fly at night, therefore; the total available daylight hours for all 12 months in 2011 (inclusive) was calculated. A reduction of 15% was then applied for turbine downtime (i.e. when the rotor blades are not operational).

Month	Daylight Hours	-15% turbine down time
January 2011	236	200.6
February 2011	266	226.1
March 2011	367	311.95
April 2011	427	362.95
May 2011	508	431.8
June 2011	528	448.8
July 2011	528	448.8
August 2011	467	396.95
September 2011	383	325.55
October 2011	322	273.7
November 2011	246	209.1
December 2011	216	183.6

Table A2 Number of estimated flight hours January 2011 to December 2011

Number of hours raptor species are potentially active during 2011 (T) = **3819.9 hours**

Calculating the Probability of a Collision

Model 1

Using a combination of the natural parameters within Table A2 along with recorded data of target species flights over the course of the survey period it is possible to predict the probability of a collision occurring and thus provide an estimation of mortality rate per annum as a result of the proposed Project.

This model is based on the assumption that geese fly in a defined direction through the turbine envelope on their daily flights between foraging areas and the South Tayside Goose Roosts Special Protection Area (SPA).

Details on the biometrics of pink-footed geese presented in Table A3 have been adapted from the following sources:

- British Trust for Ornithology Bird Facts (available at www.bto.org/birdfacts/)
- The Birds of Scotland (2007) Forrester, R. *et al.*

	Pink-footed Goose
Body Length (L)	0.68m
Wing Length (W)	1.52m
Flight speed (V)	17m/sec

Table A3: Bird Biometrics used for Collision Model.

The turbine parameters used in the CRM are detailed in Table A4 below.

	Value	Comments
Total Survey area (a)	400m ²	Precautionary survey area used
Height of turbines (h)	74m	Enercon 48 Wind turbine
Number of turbines (N)	1	
Rotor blade radius (R)	24m	
Depth of blade (d)	2.45m	
Rotation Period (sec)	2.55	
Pitch (degrees)	10	

Table A4: Turbine Specifications used for Collision Model.

The number of individual goose flights passing through the Collision Risk Window per observation hour for each month surveyed was calculated.

Month	No. hours VP observation	No. of goose flights through 'W'	No. of goose flights per hr of observation
January	6	0	0
February	12	0	0
March	8	0	0
April	14	245	17.50
September	6	0	0
October	6	0	0
November	6	0	0
December	12	0	0
		Mean	2.19

Table A5 Number of geese recorded within Collision Risk Window per observation hours for each month

	All data
Mean number of geese per hour (m)	2.19
Number of active hours (h)	2616.94
Total number of geese passing through the risk window (N=m x h)	5724.56

Table A6: Number of geese potentially passing through the CRW.

Table A7 shows the estimated number of birds likely to collide with the turbine blades each year at a 12.6% probability (P), with and without an avoidance factor.

	All data
Proportion of geese passing through the rotors likely to collide (SNH Model) ($=N \times (A/W)$)	515.21
Estimated number of collisions per year, in the absence of avoidance using P	64.9
Estimated number of collisions per year, assuming 99% (SNH) avoidance	0.6
Estimated number of collisions per year, assuming 99.91% (BTO) avoidance	0.06
Estimated number of collisions, assuming 99.93% (Fearnly et al) avoidance	0.04
Years to collision- 99%	25

Table A7 Collision Risk Model for Pink-footed Geese.

Model 2

Model 2 is based on non-directional flights through the collision risk window, which is characteristic of raptor species.

The difference in Model 2, is that the calculation uses a collision risk window which is three dimensional (volume) rather than the two dimensional Model 1 (height and width only).

Collision Risk Modelling was undertaken on four raptor species recorded within a collision risk height of 150m from ground level. Each recorded flight time was multiplied by the number of birds recorded and the total time was used in the following calculations for the 12 month period.

Firstly the amount of time each species was present within the collision risk volume throughout the survey season must be estimated (Table A8).

	Red Kite	Goshawk
Total Flight time within Collision Risk Window (sec)	232	171
Total flight time within Collision Risk Window (hours)	0.06	0.05
Flight time per survey hour (Total flight time/ survey time- 0.52/118)	0.0005	0.0004

Table A8: Flight time per survey hour of target species.

	Red Kite	Goshawk
Flight time per survey hour (as above)	0.0005	0.0004
Time period of study (Potential active hours within 1 year)	3819.9	3819.9
Predicted occupancy time within survey area at collision risk height (Recorded flight time/hours surveyed x time of study)	2.09	1.54
Predicted occupancy in seconds	7510.31	5535.62

Table A9: Predicted occupancy of the CRW for each target species.

The number of transits through the rotor swept volume is then estimated using the average flight time calculated per species.

Details on the biometrics of raptor species provided in table A10 have been adapted from the following sources:

- British Trust for Ornithology Bird Facts (available at www.bto.org/birdfacts/)
- The Birds of Scotland (2007) Forrester, R. *et al.*

	Red Kite	Goshawk
Body Length (L)	0.63	0.55
Wing Length (W)	1.85	1.50
Flight speed (V)	11.8	10

Table A10: Species biometric data.

Flight speed of the peregrine falcon is highly variable and depending on behavioural activity and for the purpose of this assessment has been based on Provan and Whitefield (2006).

The turbine parameters used in the CRM are detailed in Table A11 below;

	Value	Comments
Total Survey area (a)	400m ²	Precautionary survey area used
Height of turbines (h)	76m	Enercon 48 Wind turbine
Flight risk Volume (axh) V _w	12160000m ³	
Number of turbines (N)	1	
Rotor blade radius (R)	24m	
Depth of blade (d)	2.45	
Rotation Period	2.55	
Pitch (degrees)	10	

Table A11: Enercon Wind Turbine specification.

The volume directly covered by a single rotor = $\pi R^2 d$, where d is the depth of the blade; given that the bird will be vulnerable to a strike once its midpoint comes within a distance of $l(\text{length of bird})/2$.

	Formula	Red Kite	Goshawk
Combined Volume swept out by rotors (Vr)	$V_r = N \times \pi R^2 \times (d(\text{blade depth}) + l(\text{bird length}))$	5573.44	5428.67
Bird Occupancy within flight risk volume	Flight time per hour/ Time period of study	7510.31	5535.62
Bird occupancy (sec) of the volume swept by rotors	$= N \times (V_r / V_w)$	3.54	2.54
Bird flight speed m/sec		11.8	10
Time taken for bird to make a transit through the rotor (t) $(d+l)/V$	$T = (d + l) / v$ (speed of the bird through the rotor)	0.26	0.3
Number of bird transits through the rotor each year	$= n \times (V_r / V_w) / t$	13.54	8.46

Table A12: number of transits through the rotor swept volume each year per species.

The final stage calculates the probability of a bird colliding with the turbine when passing through the rotors. This calculation must take into account the size and flight speed of the bird and the breadth, pitch and the rotation speed of the turbine blades.

The calculation has been made using the Excel spread sheet provided by Scottish Natural Heritage as Probability = $p(r,j)$ (Tables A14- A16).

Table A15 below details the final collision risk calculation including the number of birds likely to collide with and without an avoidance factor. Avoidance rates used for each species are adapted from figures given by SNH (2010).

A 99% avoidance rate of red kite (Natural Research 2006) and goshawk is likely to be the realistic value; however SNH have taken a precautionary approach and 98% has been applied in the CRM calculation.

	Red Kite	Goshawk
Average Probability $p(r,j)$	14.3%	13.8%
Estimated number of collisions during study period (no avoidance)	1.94	1.17
Avoidance rate	98%	98%
Estimated number of collisions per year with avoidance	0.04	0.02
Years to collision	27	43
Years to collision with an avoidance rate of 99%	54	85

Table A13: Estimated mortality rate for red kite and goshawk.

Summary and conclusions

A Collision Risk Model was undertaken in relation to the proposed single turbine Project at Drummick and potential impacts upon target species.

Two models were run for directional flights (geese) and non-directional flights (raptors) through the CRW.

The first model predicted that one pink-footed goose would collide with the wind turbine every 25 years, representing 0.002% of the South Tayside Goose Roosts SPA population.

The second model predicted that with an avoidance rate of 98% (SNH 2010) one red kite would collide with the turbine every 27 years and one goshawk every 49 years.

The predicted lifespan of the proposed turbine is 25 years, therefore no birds are predicted to collide with the Drummick wind turbine based on this model.

The model predicts that no sensitive raptor species will be killed over the lifespan of the proposed wind turbine and no impacts are anticipated on the South Tayside Goose Roosts SPA.

References

Scottish Natural Heritage (2010) *Use of Avoidance Rates in the SNH Wind Farm Collision Risk Model*. Scottish Natural Heritage.

Scottish Natural Heritage (2000) *Windfarm and Birds calculating a theoretical collision risk assuming no avoidance action*. Scottish Natural Heritage.

CALCULATION OF COLLISION RISK FOR BIRD PASSING THROUGH ROTOR AREA

W Band 17/01/2012

1155

Red Kite Table A15

CALCULATION OF COLLISION RISK FOR BIRD PASSING THROUGH ROTOR AREA

Only enter input parameters in
blue

W Band 17/01/2012

Calculation of alpha and p(collision) as a function of radius										
K: [1D or [3D] (0 or 1) NoBlades MaxChord Pitch (degrees) BirdLength Wingspan F: Flapping (0) or gliding (+1) Bird speed RotorDiam RotationPeriod Bird aspect ratio: β	1 3 2.55 10 0.63 1.85 0 11.8 48 2.55 0.34	m <								

Goshawk Table A16

CALCULATION OF COLLISION RISK FOR BIRD PASSING THROUGH ROTOR AREA

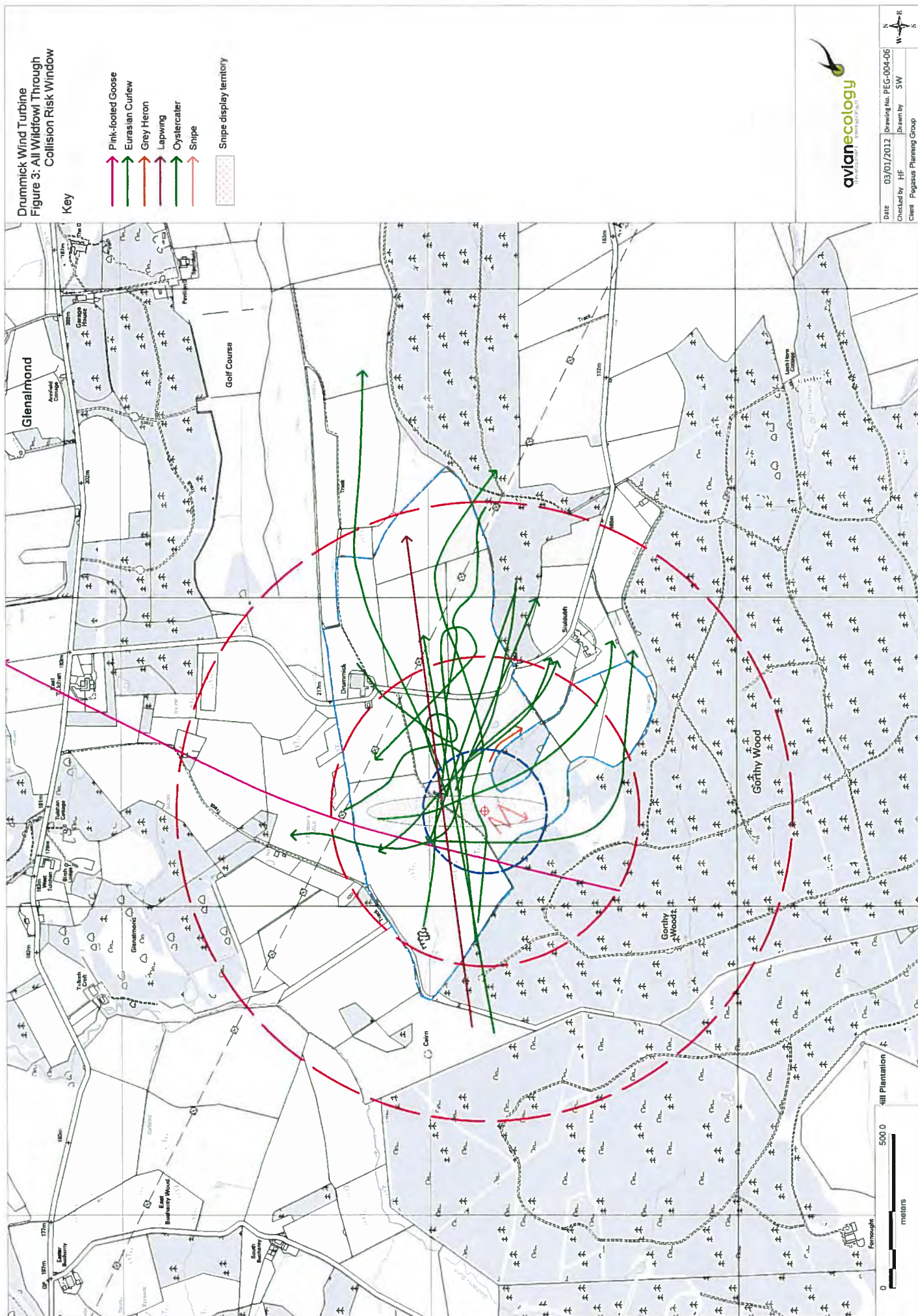
Only enter input parameters in
blue

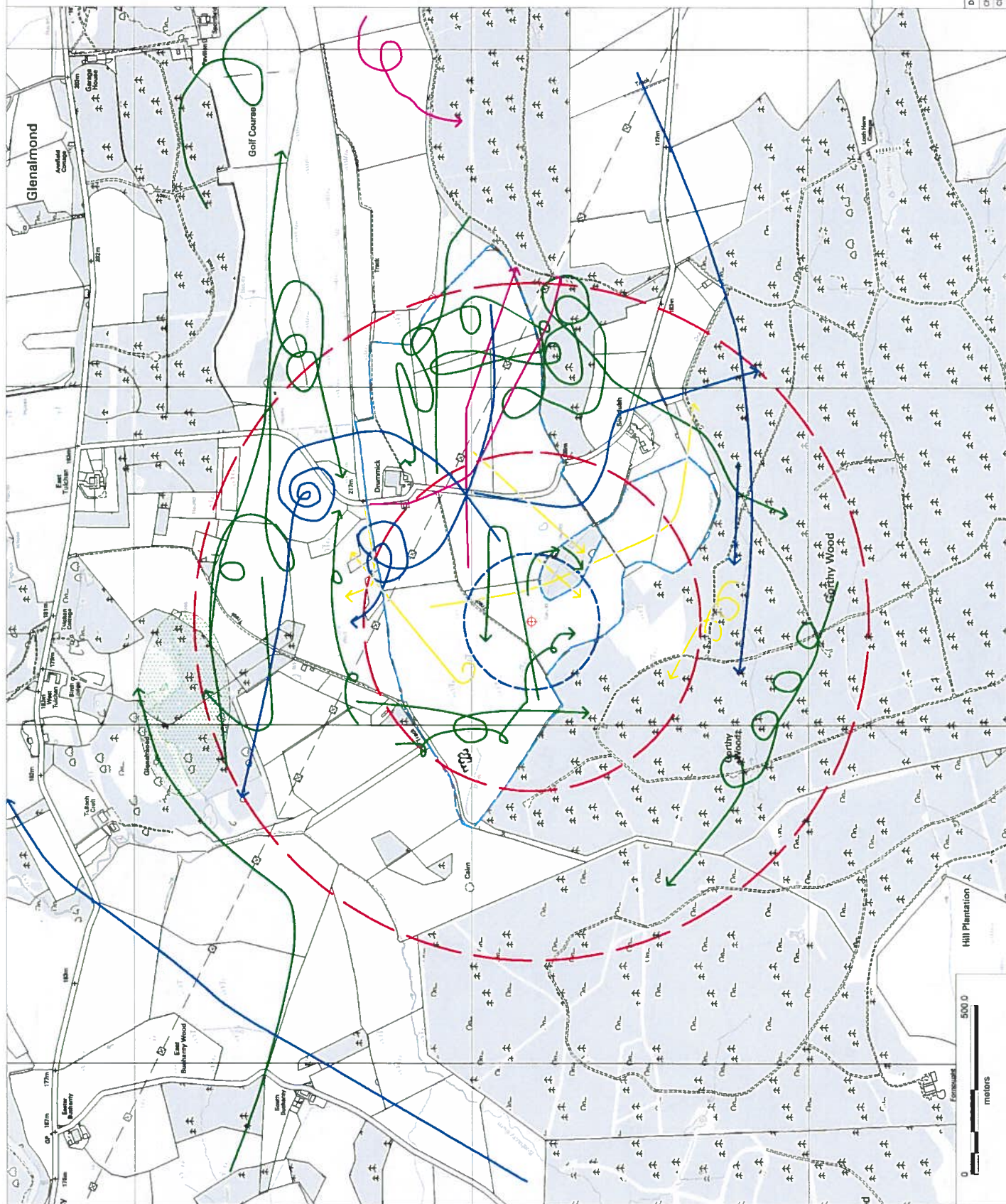
W Band 17/01/2012

Calculation of alpha and p(collision) as a function of radius														
K: [1D or [3D] (0 or 1)	NoBlades	MaxChord	Pitch (degrees)	1 3	r/R	c/C	α	Upwind:			Downwind:			
								collide length	p(collision)	contribution from radius r	collide length	p(collision)	contribution from radius r	
F: Flapping (0) or gliding (+1)	0	10		2.55	m	0.025	0.575	6.76	20.17	1.00	0.00125	19.66	1.00	0.00125
				1.5	m	0.075	0.575	2.25	6.89	0.81	0.00608	6.38	0.75	0.00563
				0		0.125	0.702	1.35	4.72	0.56	0.00695	4.10	0.48	0.00603
						0.175	0.860	0.97	3.92	0.46	0.00807	3.16	0.37	0.00650
				10	m/sec	0.225	0.994	0.75	3.44	0.41	0.00912	2.56	0.30	0.00679
				48	m	0.275	0.947	0.61	2.80	0.33	0.00907	1.97	0.23	0.00636
RotationPeriod	2.55	sec				0.325	0.899	0.52	2.35	0.28	0.00900	1.56	0.18	0.00595
						0.375	0.851	0.45	2.02	0.24	0.00890	1.26	0.15	0.00557
						0.425	0.804	0.40	1.76	0.21	0.00878	1.04	0.12	0.00522
Bird aspect ratioo: β	0.37					0.475	0.756	0.36	1.56	0.18	0.00872	0.89	0.10	0.00498
						0.525	0.708	0.32	1.44	0.17	0.00887	0.81	0.10	0.00500
						0.575	0.660	0.29	1.33	0.16	0.00900	0.75	0.09	0.00504
						0.625	0.613	0.27	1.24	0.15	0.00910	0.70	0.08	0.00511
						0.675	0.565	0.25	1.16	0.14	0.00918	0.66	0.08	0.00520
						0.725	0.517	0.23	1.08	0.13	0.00923	0.62	0.07	0.00532
						0.775	0.470	0.22	1.02	0.12	0.00926	0.60	0.07	0.00546
						0.825	0.422	0.20	0.95	0.11	0.00926	0.58	0.07	0.00563
						0.875	0.374	0.19	0.90	0.11	0.00924	0.57	0.07	0.00583
						0.925	0.327	0.18	0.84	0.10	0.00919	0.56	0.07	0.00604
						0.975	0.279	0.17	0.79	0.09	0.00912	0.55	0.06	0.00633
Overall p(collision) =										Upwind		Downwind		10.9%
										16.7%				
Average										13.8%				

Figure 2: All Wildfowl Flights

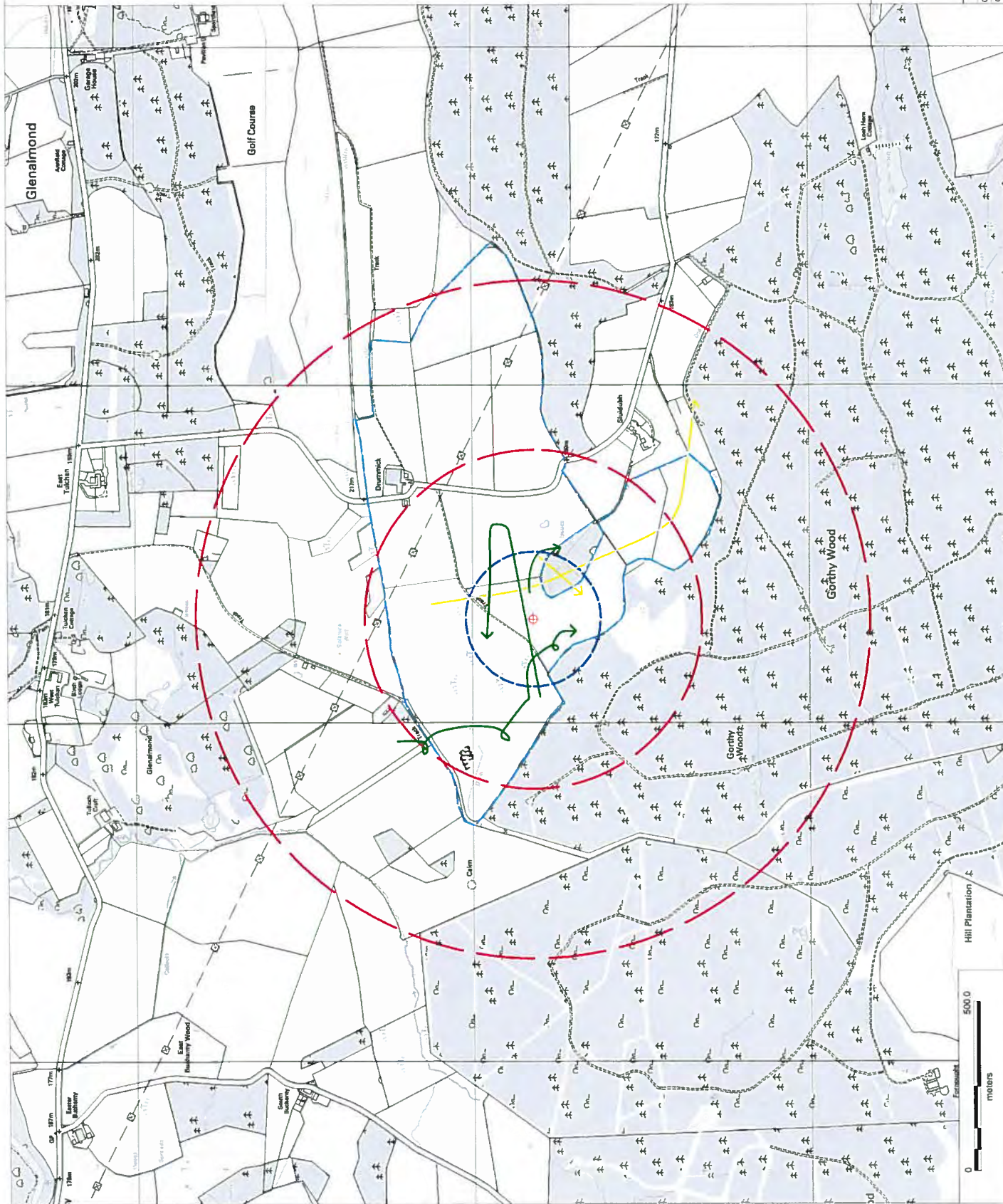




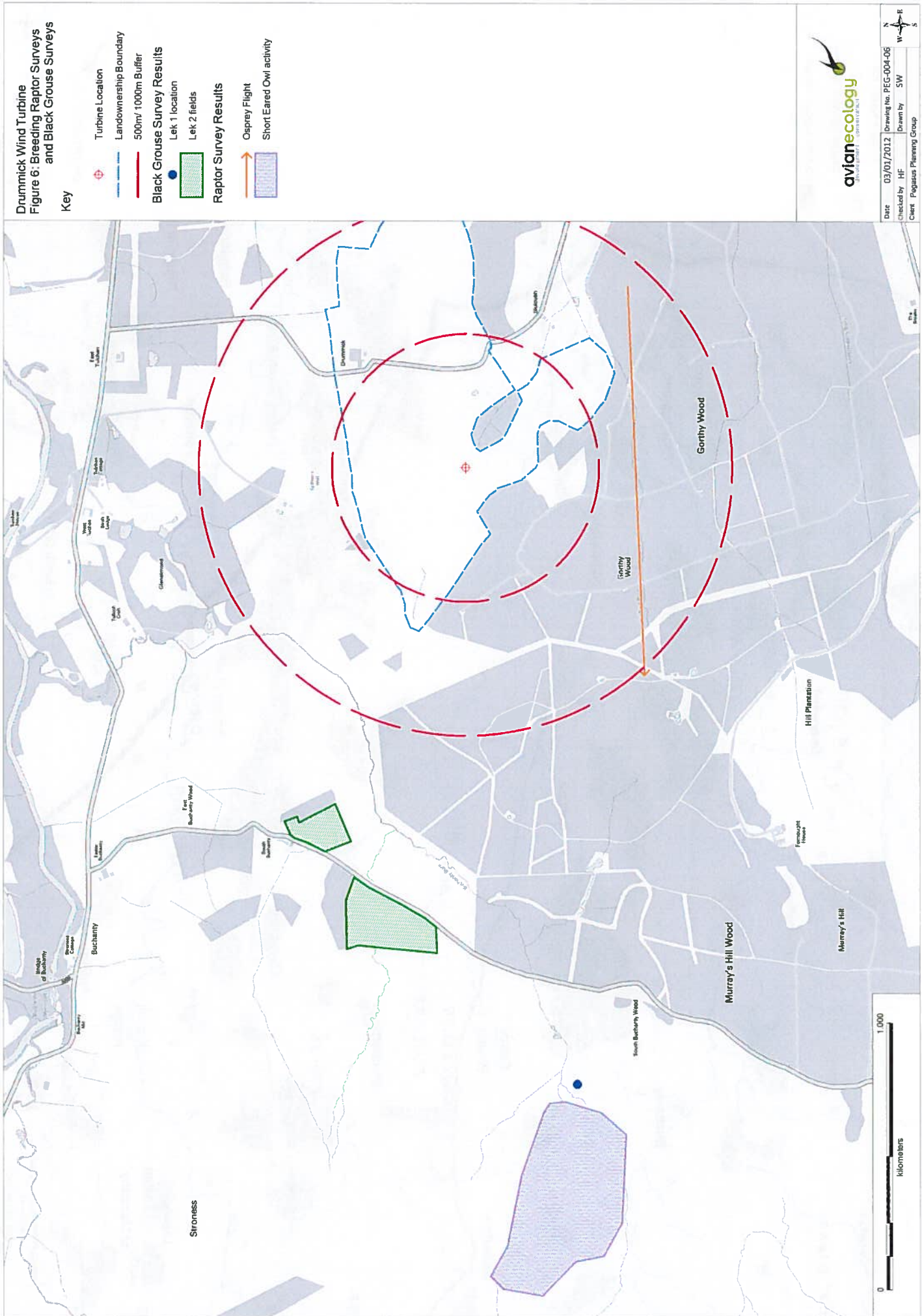


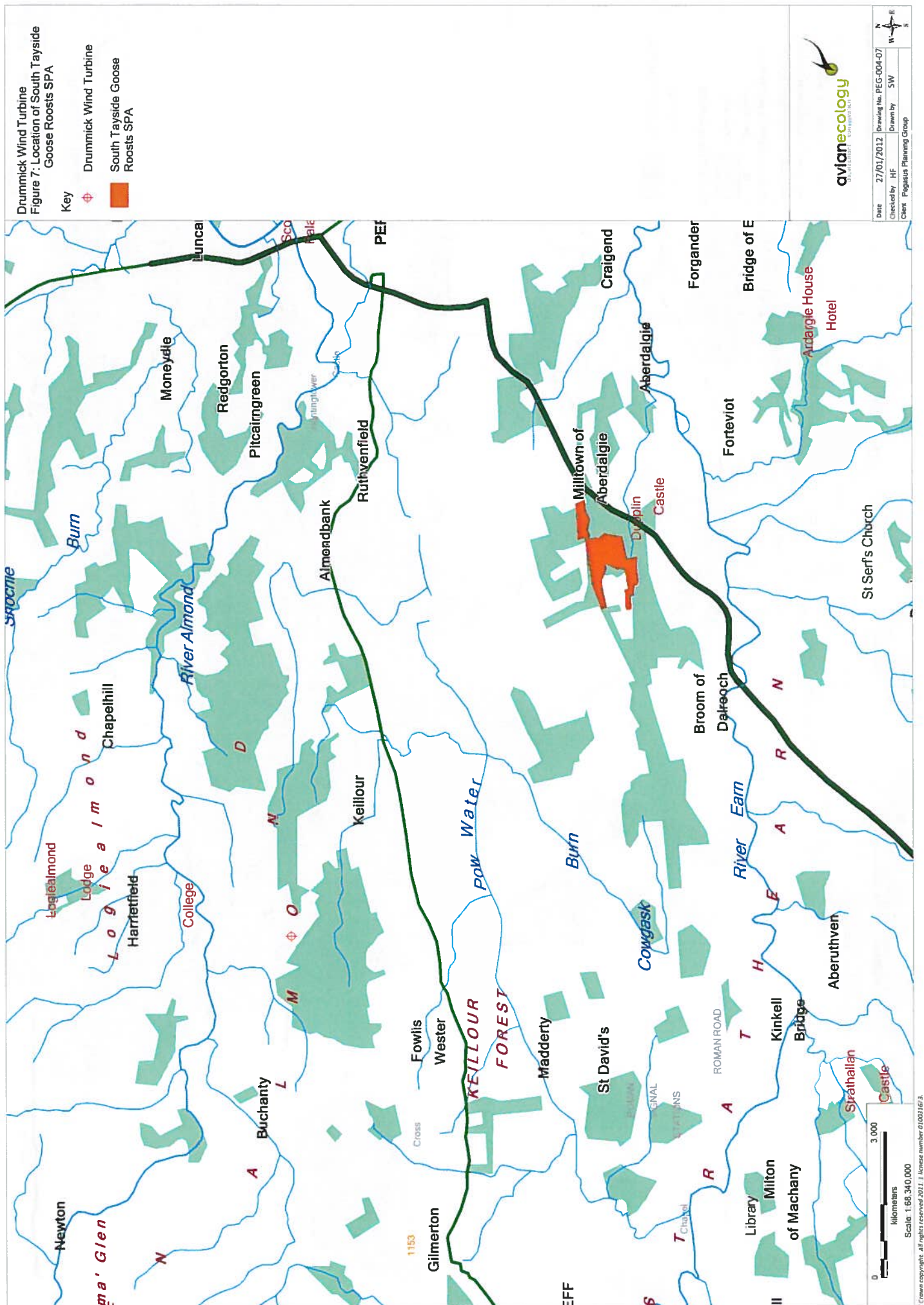
Drumstick Wind Turbine
Figure 5: All Raptor Species
Through Collision Risk
Window

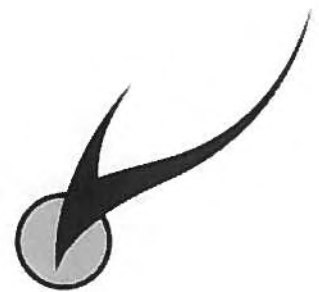
Key
→ Red Kite
→ Goshawk



Date	03/03/2012	Drawing No.	PEG-004-06
Checked by	HF	Drawn by	SW
Client	Pegasus Planning Group		







Drummick, Perth

for Pegasus Planning Group on behalf of
Clearwinds Ltd

Report number: 11-PEG-002

Author:

C Baldock

Date: 7th December 2011

Approved:

R Leigh

This report has been prepared for the Pegasus Planning Group in accordance with the terms and conditions of appointment for Bat Activity Surveys. Avian Ecology Ltd (6839201) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

Bat Activity Surveys 2011

CONTENTS

1	Introduction	3
	1.1. Background	3
	1.2. Legislative Framework	3
2	Methodology	4
	2.1. Field Surveys	4
	2.2. Survey Limitations.....	6
3	Results	7
	3.1. Habitats.....	7
	3.2. Field Surveys	8
4	Summary.....	14

1 INTRODUCTION

1.1. BACKGROUND

1.1.1. This report presents the findings of an assessment of bat presence and activity undertaken at Drummick, near Glenalmond, Perth for Pegasus Planning Group on behalf of Clearwinds Ltd. The surveys were commissioned in relation to a proposed single wind turbine development.

1.1.2. Habitats on site were identified as having the potential to support bats and consequently bat activity surveys were commissioned. The aims of the survey were to;

- Establish an understanding of the bat assemblage and utilisation of the site;
- Identify the importance of the site for bats at a local regional and national level; and,
- Determine any potential impacts the proposed turbine may have on bats.

1.2. LEGISLATIVE FRAMEWORK

1.2.1. All species of British bat are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and are therefore afforded special protection. It is an offence to:

- Intentionally kill, injure or take any wild bat;
- Intentionally damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection;
- Intentionally or recklessly disturb any wild bat while it is occupying a structure or place that it uses for shelter or protection.

1.2.2. Bats are further protected under the Conservation (Natural Habitats & conservation Regulations 1994 as amended which make it an offence to:

- Capture or kill a bat;
- Significantly disturb a bat (in any location); and
- Damage or destroy a breeding site or resting place of any bat.

1.2.3. If bats are present on a development site and, as a result of the development there is a likelihood that a roost may be damaged or destroyed, or where there is considered to be a reasonable possibility that bats occupying a roost may be significantly disturbed, or where there would be a requirement to significantly disturb a bat irrespective of its location, the development can only proceed if a European Protected Species (EPS) licence is issued by Natural England.

2 METHODOLOGY

2.1. FIELD SURVEYS

Relevant guidance

2.1.1. The survey methodology and subsequent interpretation of results made reference to the following guidance documents;

- Bat Conservation Trust (2007). 'Bat Surveys - Good Practice Guidelines.' Bat Conservation Trust, London.
- Bat Conservation Trust (2011). 'Bat Surveys - Good Practice Guidelines, Surveying for Onshore Wind Farms.' Bat Conservation Trust, London.
- Cool, J., McCarthy, A., Holloway, S., Oliver, G. (2008). 'Survey Guidance for Assessing Bat Activity at Proposed On Shore Wind Farms.' In Practice, journal of the Institute of Ecology and Environmental Management. Issue No 62, December 2008.
- Natural England (2009). Technical Information Note TIN051 'Bats and onshore wind turbines Interim guidance.' Natural England. Peterborough.
- Natural England (2009). Technical Information Note TIN059 'Bats and Single large wind turbines: Joint Agencies interim guidance.' Natural England. Peterborough.

Survey methods

2.1.2. All bat surveys were overseen by Mr Roy Leigh (MIEEM) who is a licensed bat worker and who specialises in survey and assessment for wind energy projects. Bat surveys were undertaken by Andy Carroll, Mick Carroll and Caroline Carroll. The Extended Phase 1 Survey was undertaken by Andrew Logan (MSc MIEEM).

2.1.3. All personnel engaged in bat sound analysis have received specific training in Analook software in either 2010 or 2011 (training by Sandie Sowler PhD MIEEM).

2.1.4. The following survey methodologies were employed:

- Extended Phase 1 Habitat Survey
- Manual activity surveys
- Static automated monitoring at turbine locations

2.1.5. Bat registrations were recorded onto digital media for subsequent analysis using 'Analook' and 'BatScan' software.

2.1.6. Bat data is presented following the Bat Conservation Trust (BCT) recent guidance (2011), whereby activity is expressed as an index (i.e. bat passes per unit of time, in this case per hour).

2.1.7. A bat pass was defined as an automatically triggered bat call registration from the microphone. For analysis purposes, one bat pass is defined as a bat registration with

a gap of more than 5 seconds between further registrations. Where less than 5 seconds is noted, passes were grouped together and classified as 'constant feeding' activity, whereby it is assumed a single bat is foraging within range of the microphone.

Extended Phase 1 Habitat Survey

- 2.1.8. The Extended Phase 1 Habitat survey employed a methodology based-upon that outlined in the 'Handbook for Phase 1 Habitat Survey' (JNCC, 2003) whereby all habitats within 500m of the proposed turbine are mapped onto an appropriately scaled field plan.
- 2.1.9. Full results of this survey are not presented in this report; however findings are discussed in relation to their significance for bats. For the complete Extended Phase 1 Survey, see Avian Ecology Report 11-PEG-004.

Manual activity surveys

- 2.1.10. Manual bat activity surveys comprised a single transect, designed to sample bat activity and provide representative data for all habitat types within 500m of the proposed turbine location. Habitats of both high and low value for bats were incorporated within the transect (see Figure 1 for layout).
- 2.1.11. The transect methodology followed that detailed in best practice guidance (BCT, 2007). A route was walked, interspersed with 10 Listening Points (LPs), and activity was recorded on an Anabat SD2 bat detector. At each listening point, recordings were made over a 5 minute period.
- 2.1.12. Manual activity surveys were undertaken at this site on 3rd July, 8th August and 20th September 2011. Table 2.1 provides further details of dates and timings.

Manual bat activity survey details		
Date	Start time	End time
03/07/2011	22:00	23:55
08/08/2011	21:16	23:11
20/09/2011	20:15	22:05

Table 2.1 Manual bat activity survey timing.

Static automated monitoring

- 2.1.13. A single automated monitoring station was established within an area of improved grassland, beside a small section of stone wall, the site of the original proposal, however this is 260m from the current proposed turbine location (see Figure 1).
- 2.1.14. The monitoring station is set in similar habitat conditions to the proposal site.
- 2.1.15. The automated bat monitoring station comprised a 10m high mast fitted with either two Anabat SD2 detectors (during July and August surveys) or an SM2 attached to two microphones (during September surveys).
- 2.1.16. The two Anabat SD2 detectors were positioned as follows:

- One detector attached to a microphone fitted with a deflector and secured to the top of the mast to record bat activity above 10m in height.
 - One detector was attached at approximately 1.5m in height to record bat activity below 10m in height.
- 2.1.17. The SM2 bat detector was fitted with two omnidirectional microphones, one secured at 10m height and one secured at 1.5m height.
- 2.1.18. Monitoring stations were left in-situ over two to three consecutive nights and detectors were programmed to survey over night-time hours. Discrepancies between survey start and finish times and sunset and sunrise timings were taken into account when calculating bat passes per hour. During the two nights in September, equipment problems meant that recording timings were irregular. For details of dates and timings and sunrise and sunset timings see Appendix 1, Tables A1 and A2.

Timing and weather conditions

- 2.1.19. Field surveys were undertaken in July, August and September 2011, timed to coincide with peak bat activity periods and provide data for the summer and autumn seasons. As far as possible, surveys were completed in periods with weather conditions conducive for bat surveys i.e. relatively mild, dry and with low wind speeds.

2.2. SURVEY LIMITATIONS

- 2.2.1. All bat surveys provide only a snapshot of bat activity and are intended to inform a planning application only. Bat activity is likely to vary over time and in differing conditions and, as such, a negative result does not prove a lack of all bat activity, but does provide a strong indication of activity levels.
- 2.2.2. Surveys for bat activity at the height of the proposed turbine 'rotor swept area' were not possible due to a lack of suitable structures to install a microphone at height. However, an attempt to differentiate between bat activity above and below 10m was made using a temporary mast (see paragraph 2.1.14 to 2.1.16). It is acknowledged that bat activity at height is likely to differ between the turbine rotor sweep and ground level.
- 2.2.3. The static monitoring station was established approximately 260m from the proposed turbine location. Therefore it is not likely to be fully representative of bat activity levels at the turbine location.
- 2.2.4. Although the use of bat detectors is the most widely used method for undertaking activity surveys and automated monitoring, it is naturally biased: bats that echolocate relatively loudly are more easily detected than those that echolocate relatively quietly, or those that focus their calls within a relatively narrow 'beam' (e.g. horseshoe bats). This can lead to the quieter bats being under-recorded during bat detector surveys.
- 2.2.5. All bats have been identified by their echolocation calls. This requires professional judgement and in many cases it is not possible to safely assign an individual bat call to a

species. To this end, species have been grouped where appropriate, in-keeping with normal protocols. It should be noted that identification of those calls assigned to individual species is done on the basis of judgement and experience.

2.2.6. Results

2.3. HABITATS

Habitat appraisal – Extended Phase 1 Habitat Survey

- 2.3.1. Habitats within 500m of the proposed turbine location predominantly consist of improved and semi-improved grassland with scattered rush *Juncus spp.*. Other habitats include marshy grassland, a small area of coniferous plantation woodland and tracts of scrub. Gorthy Wood, a large block of coniferous plantation woodland located to the south west, and an area of rush heath are located to the east of the site, just outside the land-ownership boundary.
- 2.3.2. Field boundaries predominantly comprised post and wire fences, with small sections of stone wall. Several small burns and partially dry drainage channels are also present on site.
- 2.3.3. The open and exposed nature of the site and lack of vegetative field boundaries limits the potential of the site to support bats. A block of coniferous woodland plantation 80m to the south-east of turbine offers shelter and foraging opportunities; however it is poorly connected to the wider landscape. Coniferous and plantation edge, rush heath and fringes of scrub provide bat interest features towards the edges of the land ownership boundary.
- 2.3.4. No bat roost sites or potential roost sites were identified within 500m of the proposed turbine location.

Manual activity survey route

- 2.3.5. Table 3.1 below provides a summary of habitats on site in relation to manual activity surveys, giving details of available habitats and features at select Listening Points along the transect route (see Figure 1 for listening point locations).

Listening Point	Habitat Features
LP1	Corner of field, near end of hedge
LP2	Corner of field by fence
LP3	Corner of field by scattered scrub
LP4	Edge of field between scattered scrub and line of trees
LP5	Within field, near to drainage channel
LP6	Edge of field/corner of plantation
LP7	Corner of field bounding area of felled plantation
LP8	Edge of field beside block of coniferous plantation
LP9	Edge of field beside fence
LP10	Edge of field beside fence

Table 3.1 Listening point locations and habitat features on the activity transect.

2.4. FIELD SURVEYS

- 2.4.1. No evidence of roosting bats was determined during the bat activity surveys.
- 2.4.2. Bat data is presented following the Bat Conservation Trust (BCT) recent guidance (2011), whereby activity is expressed as an index (i.e. bat registrations per unit of time, in this case per hour).
- 2.4.3. Bat calls are analysed to species level where possible, however in some cases it was only possible to identify calls to species group. The following terms are used:
 - Pipistrellus species – refers to bats from the Pipistrelle family. Three species occur in the UK: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and Nathusius' pipistrelle *Pipistrellus nathusii*. For the purposes of this report the term refers to either soprano or common pipistrelle, due to calls with characteristics that made it difficult to distinguish between the two species.

- **Myotis species** – refers to bats from the Myotis family. There are 5 species from this family occurring in the UK: Natterer’s *Myotis nattereri*, Daubentons *Myotis daubentonii*, whiskered *Myotis mystacinus*, Brandts *Myotis brandtii*, Bechsteins *Myotis bechsteinii* and Alcathe’s *Myotis alcathoe*.

Manual activity surveys

- 2.4.4. Calls with the characteristics of the following species were recorded during the manual activity surveys: common pipistrelle, soprano pipistrelle, and pipistrellus species.
- 2.4.5. Table 3.2 below details the number of bat registrations of species recorded during the manual bat activity survey (combining data from the walking parts of the transect and specific LPs). The table details the total number of bat registrations recorded with results factored to provide a bat activity index (bat registrations / per unit time) as recommended in recent guidance surveying for onshore wind farms (BCT 2011).
- 2.4.6. For details of weather conditions see Appendix 1, Table A3.

	Summary of bat transect survey data (2011)					
	03 rd July		8 th August		20 th September	
	Total passes	Passes per hr	Total Passes	Passes per hr	Total passes	Passes per hr
C.pipistrelle	3	1.57	1	0.52	-	-
S.pipistrelle	1	0.52	57	29.74	21	11.45
Pipistrellus species	4	2.09	7	3.65	-	-
All bats	8	4.17	65	33.91	21	11.45
Survey Length	1 hour 55 minutes		1 hour 55 minutes		1 hour 50 minutes	

Table 3.2 Summary of bat survey results for manual activity surveys (transects & LPs) undertaken in July, August and September 2011. The table shows survey duration (in hrs/mins); actual number of bat registrations recorded and bat activity index (registrations per hour).

- 2.4.7. Medium activity levels were recorded during the manual activity surveys. The highest activity was observed on the 8th August and the lowest on the 3rd July, and during all surveys activity was highly concentrated near bat habitat features such as the edge of coniferous plantation.
- 2.4.8. Figure 2 displays the spatial distribution of bat activity recorded at listening points along the transect route. Bat calls were recorded at 3 of the 10 listening points: LP5, LP6 and LP7. All 3 of these are located on the eastern edge of the transect, relatively close to Gorthy Wood, a large area of coniferous plantation. 92.9% of listening point activity was recorded at LP's 6 and 7, with LP6 located in a field corner bounded by coniferous woodland, and LP7 beside sheltered heath.
- 2.4.9. No bat activity was recorded in more open habitats such as along field edges beside fence lines. There was also no activity recorded in association with less extensive and more isolated areas of woodland and scrub, including the coniferous plantation beside LP8.
- 2.4.10. Clusters of activity are often linked to habitat features associated with high invertebrate availability, which are favoured for foraging and commuting activity. At such locations high levels of bat activity can be recorded as a result of multiple recordings of the same individuals whilst foraging.
- 2.4.11. The two listening points that are closest to the proposed turbine location (LP's 8 and 9) did not record any bat activity during the manual activity surveys.

Static automated monitoring surveys at turbine location

- 2.4.12. The automated monitoring surveys exhausted 65.9 hours of recording time in total, over 2-3 nights during each period of survey and in suitable weather conditions.
- 2.4.13. Analysis of data recorded during the automated bat activity surveys identified calls with the characteristics of common pipistrelle, soprano pipistrelle, pipistrellus

species and *Myotis* species. It was not possible to identify some registrations to a specific species or risk group and these are classified as 'unknown'.

2.4.14. Tables 3.3 and 3.4 present total bat passes per night for each of the three monitoring periods, broken down by night. Activity is differentiated between that recorded at height ('high' microphone set at the top of the 10m mast), that recorded above ground level, labelled ('low' microphone set at approximately 1.5m in height), and activity that was simultaneously recorded on both 'high' and 'low' positioned microphones.

	June/July									
	Night 1			Night 2			Night 3			Total
	Low	High	Low/High	Low	High	Low/High	Low	High	Low/High	
Myotis	-	-	-	-	-	-	-	-	-	-
Pipistrellus spp.		1	-	5	-	-	4	1	1	12
C. Pipistrelle	1	1	-	75	-	-	58	1	7	143
S. Pipistrelle	-	1	-	1	1	-	3	-	1	7
Unidentified	-	-	-	-	-	-	-	-	-	-
Total	1	3	-	81	1	1	65	2	9	162

Table 3.3 Summary of bat activity recorded at the automated monitoring station between the periods 30th June and 3rd July 2011.

	August									
	Night 1			Night 2			Night 3			Total
	Low	High	Low/ High	Low	High	Low/ High	Low	High	Low/ High	
Myotis	1	-	-	1	-	-	-	-	-	2
Pipistrellus spp.	11	1	-	4	2		1	1	-	20
C. Pipistrelle	9	2	-	3	2	4	13	-	-	33
S. Pipistrelle	44	15	2	52	3	1	12	-	1	130
Unidentified	-	-	-	-	-	-	-	-	-	-
Total	65	18	2	60	7	5	26	1	1	185

Table 3.4 Summary of bat activity recorded at the automated monitoring station between the periods 17th August to 20th August 2011.

	September									
	Night 1			Night 2			Night 3			Total
	Low	High	Low/High	Low	High	Low/High	Low	High	Low/High	
Myotis	-	-	-	-	-	-	-	-	-	
Pipistrellus spp.	-	-	-	-	-	-	-	-	-	
C. Pipistrelle	-	-	-	-	-	-	-	-	-	
S. Pipistrelle	6	-	1	4	-	2	6	-	2	21
Unidentified	-	-	-	-	-	-	-	-	-	-
Total	6		1	4		2	6		2	

Table 3.5 Summary of bat activity recorded at the automated monitoring station between the periods 19th -21st September 2011.

2.4.17. Chart 3.1 shows the proportion of calls registered on either the 'high' microphone, the 'low' microphone, or simultaneously on both the 'low' and 'high' microphones.

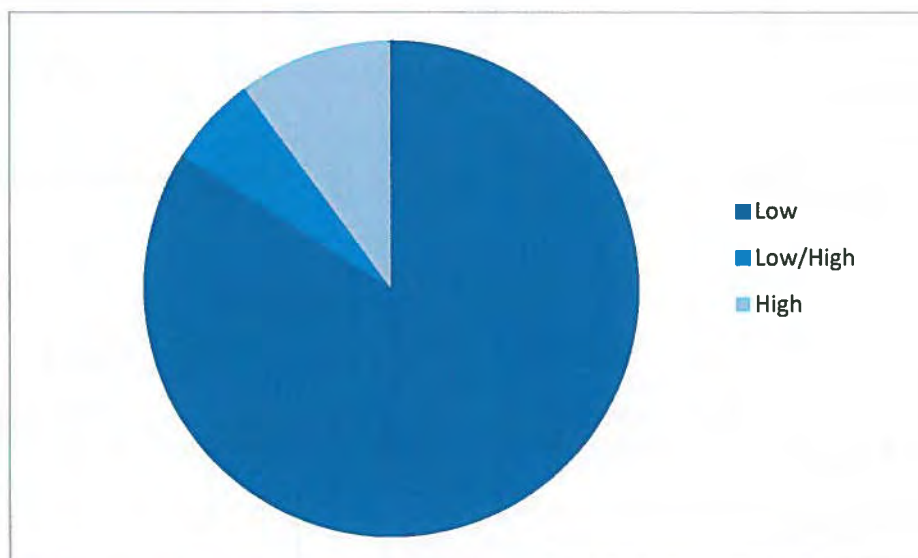


Chart 3.1 Proportion of calls registered per height.

2.4.18. 84% of calls were registered on the 'low' microphone, 10.1% on the 'high' microphone, and 5.9% of activity was recorded at both 'low' and 'high' microphones simultaneously.

2.4.19. Table 3.6 summarises the results of the static bat activity surveys, factoring results in-line with latest guidance (BCT 2011) to provide a bat activity index (bat passes / per unit time). The survey timing calculations accounted for differences in sunset and sunrise timings on the respective survey dates.

Bat Species / Species group	Static Monitoring Station			
	June/July	August	September	All months
Myotis	-	0.07	0.13	0.06
Pipistrellus spp.	0.51	0.74	-	0.49
C. Pipistrelle	6.11	1.22	-	2.67
S. Pipistrelle	0.30	4.81	0.32	2.15
Unidentified	-	-	0.13	0.03
All bats	6.92	6.85	0.58	5.40

Table 3.6 Summary of bat survey activity during the static automated monitoring surveys undertaken for the periods 30th June to 3rd July, 17th August to 20th August and 19th 19th September to 21st September. The table shows bat passes per hour (in line with BCT guidance 2011), broken down by species/species group.

2.4.20. Surveys in late June/early July comprised a total of 23.4 hours of recording time over 3 nights. During this period a total of 162 bat passes were registered at the static monitoring station. Surveys in August comprised 27 hours of recording time over 3 nights, with a total of 185 bat passes registered. Finally, September surveys comprised a total of 15.5 hours of recording time over 2 nights, with 9 bat passes recorded.

2.4.21. Overall, bat activity was much lower during the September surveys compared to the other months.

2.4.22. Chart 3.2 shows the composition of bat species/species groups at the static monitoring station for all survey periods combined.

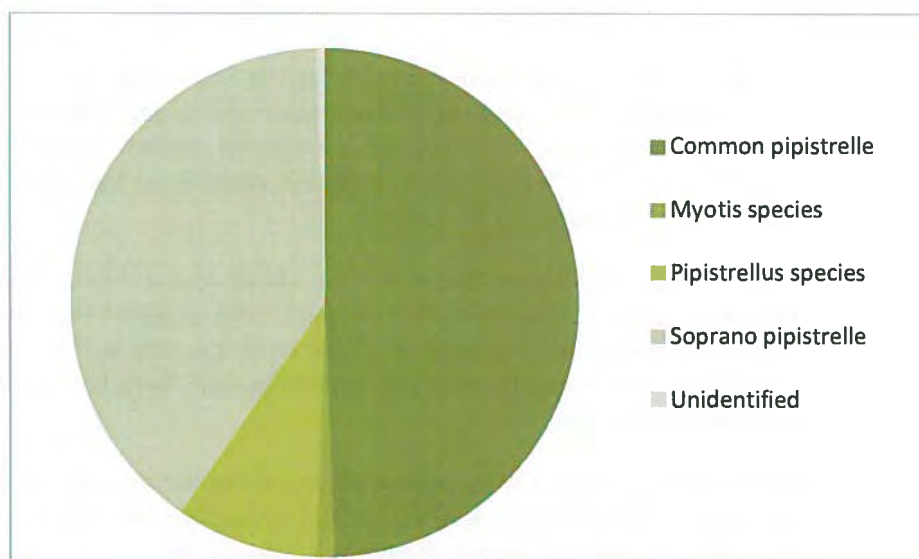


Chart 3.2 Composition of bat species/species groups at static monitoring station 1.

2.4.23. Surveys during each period registered bats on every night of survey, with the vast majority of registrations (98.3%) relating to common pipistrelle and soprano

pipistrelle bats. Myotis species and unidentified bat species were also recorded at very low levels.

3 SUMMARY

- 3.1.1. Habitats within 500m of the proposed turbine are generally of low to medium quality for bats, due to their open and exposed nature. A number of habitats towards the edges of the land ownership boundary, including coniferous plantation edge, rush heath and scrub, provide some foraging and commuting opportunities for bats.
- 3.1.2. Analysis of data collected from the bat activity surveys (manual and automated) at the application site identified several species, with call characterises indicating the presence of common pipistrelle, soprano pipistrelle, pipistrellus species, Myotis species and unidentified species.
- 3.1.3. Manual activity surveys identified large clusters of activity in association with Gorthy Wood coniferous plantation and an area of sheltered heath on the eastern edge of the transect route. These habitats are likely to provide sheltered commuting and foraging potential for bats.
- 3.1.4. During the static surveys the most commonly encountered species was common pipistrelle, closely followed by soprano pipistrelle. Myotis and 'unknown' species were also recorded, but at level low activity levels (0.06 and 0.03 calls per hour, respectively).
- 3.1.5. Overall, bat activity during the static surveys was low, with the odd night of medium-level activity, probably reflecting the open and exposed nature of the landscape as a whole. The overall bat activity index (passes per unit hour) during static surveys was 5.4.
- 3.1.6. Bat activity levels were much lower during the September surveys comparative to July and August. This may result from this month being relatively late in the bat survey season; however bat activity will also be strongly influenced by transient factors such as weather conditions, especially considering that monitoring only took place over 2 to 3 nights on each month.
- 3.1.7. 84% of bat activity was recorded at 1.5m above ground level, whereas 10.1% was recorded by the microphone at 10m high. This suggests that the recorded bat activity was predominantly close to ground level; however as the mast was only 10m high, there is the possibility that calls emitted by high-flying bats were not registered on either microphone.
- 3.1.8. During the static monitoring surveys all registered bat activity was associated with bat species considered at low risk at the population level in the context of this development (Natural England Guidance TIN051 (2009).
- 3.1.9. No bat roosts were identified within 500m of the proposed turbine.

- 3.1.10. The proposed turbine location is more than 50m from the nearest important bat habitat feature (coniferous plantation woodland) and therefore conforms with Natural England Guidance TIN059 (2009).
- 3.1.11. The site is considered to be of low importance for bats, with low to moderate activity levels attributed to relatively common UK species.
- 3.1.12. Activity is highly clustered around specific bat habitat features, such as the edge of the coniferous woodland at Gorthy Wood, which is likely to provide a foraging and commuting corridor of moderate local importance for bats; however the proposed development is not anticipated to impact upon these areas.
- 3.1.13. No constraints relating to bats are foreseen in relation to the proposed single wind turbine development.

REFERENCES

Bat Conservation Trust (2007). 'Bat Surveys – Good Practice Guidelines.' Bat Conservation Trust, London.

Bat Conservation Trust (2011). 'Good Practice Guidelines – Surveying for Onshore Wind farms.' Bat Conservation Trust, London.

Cool, J., McCarthy, A., Holloway, S., Oliver, G. (2008). 'Survey Guidance for Assessing Bat Activity at Proposed On Shore Wind Farms.' In Practice, journal of the Institute of Ecology and Environmental Management. Issue No 62, December 2008.

Natural England (2009). Technical Information Note TIN059 'Bats and single large wind turbines: Joint Agencies Interim guidance'. HMSO

Natural England (2009). Technical Information Note TIN051 'Bats and onshore wind turbines Interim guidance.' HMSO

FIGURE 1: BAT SURVEY LAYOUT

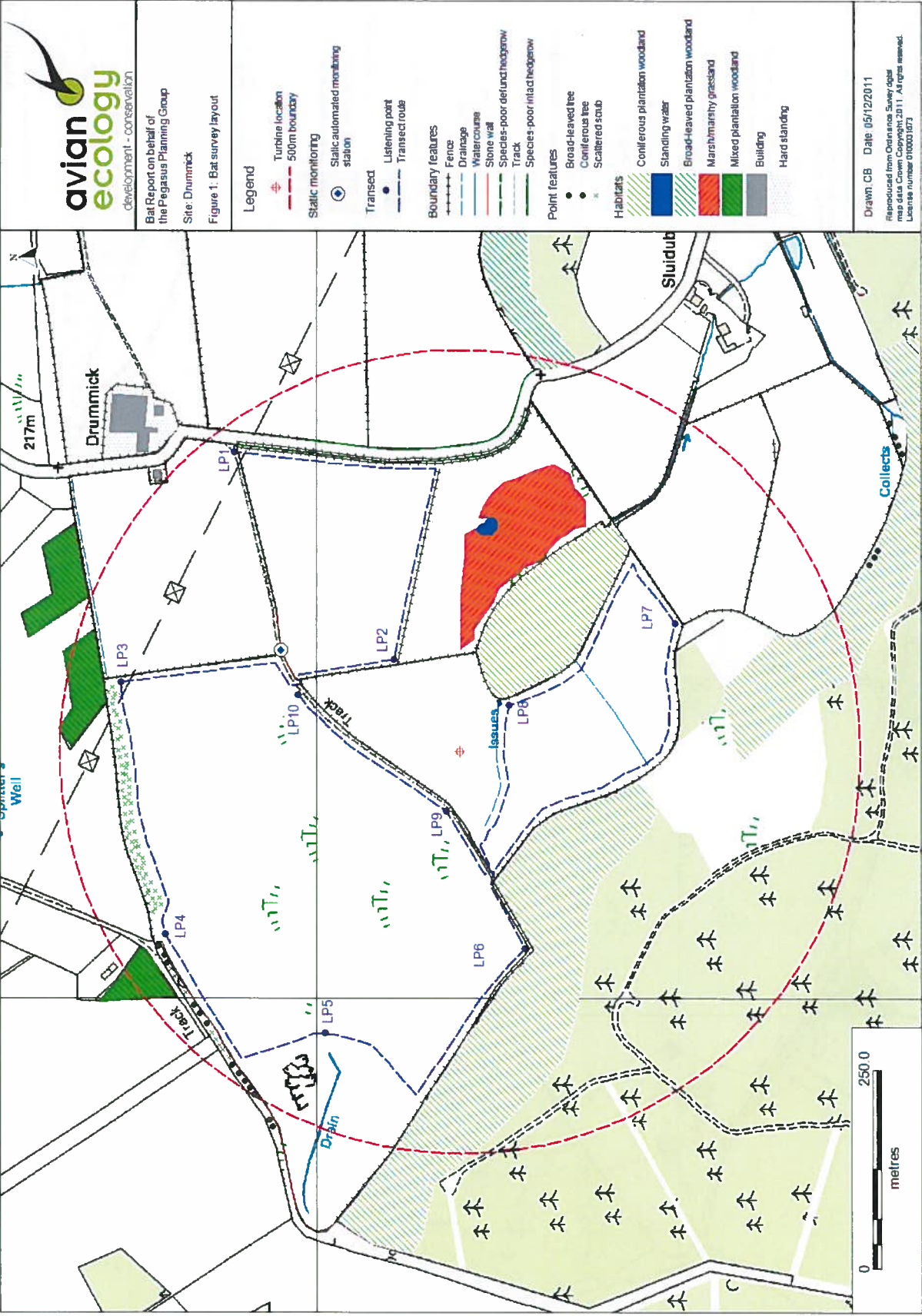
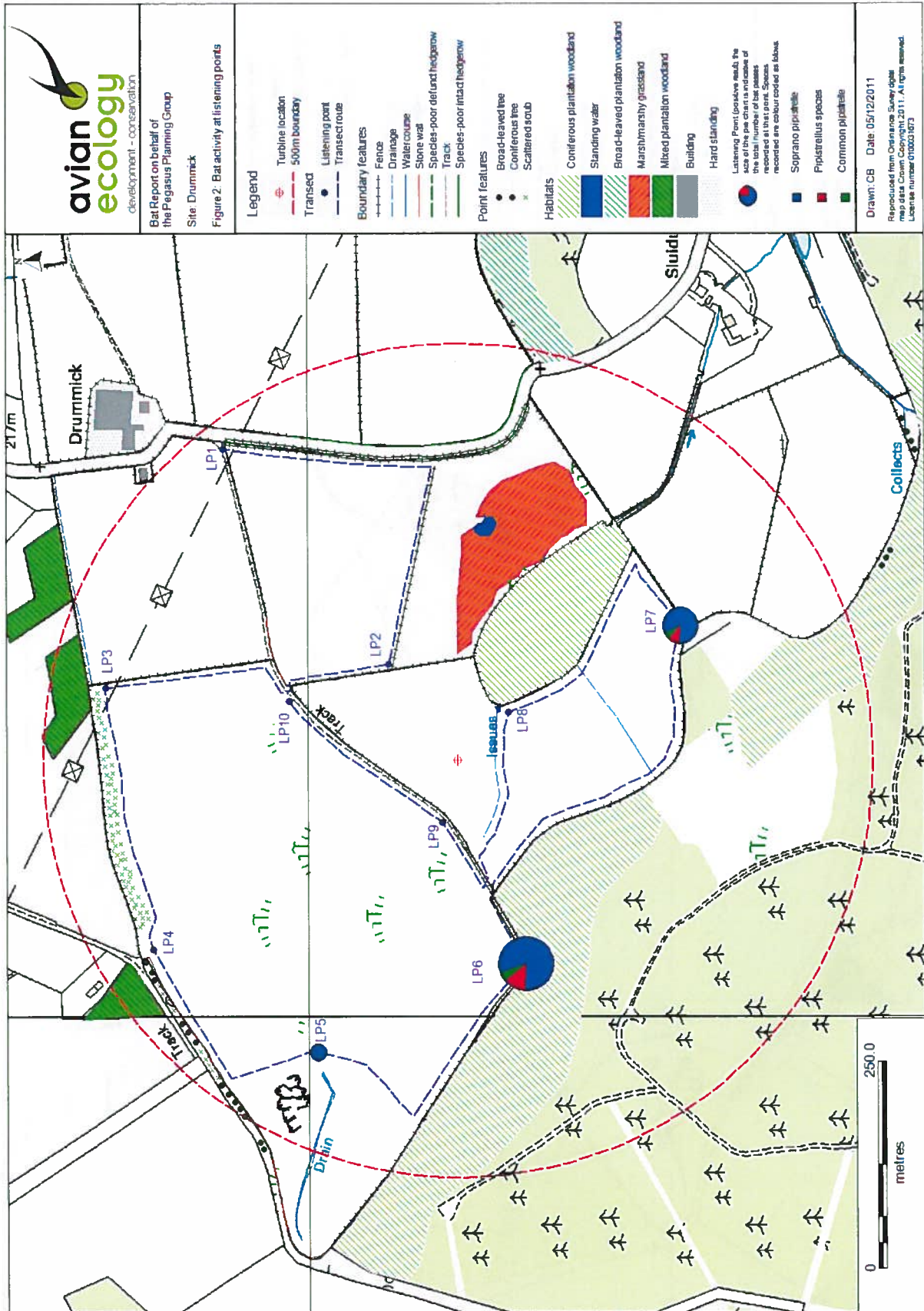


FIGURE 2: BAT ACTIVITY AT LISTENING POINTS



APPENDIX 1

Automated bat activity - survey timings		
Survey dates	Night	Survey period per night (start time – end time)
30/06/2011 – 03/07/2011	1	21:30 – 06:00
	2	21:30 – 06:00
	3	21:30 – 06:00
17/08/2011 – 20/08/2011	1	21:00 – 06:00
	2	21:00 – 06:00
	3	21:00 – 06:00
20/09/2011 – 21/09/2011	1	00:10 – 06:54
	2	18:21 – 03:20

Table A1 Automated bat activity survey timing.

Sunset and sunrise timings (30 minutes before and after)		
Survey dates	Night	30 mins before sunset – 30 mins after sunrise
30/06/2011 – 03/07/2011	1	20:51 - 05:17
	2	20:51 - 05:18
	3	20:51 - 05:19
17/08/2011 – 20/08/2011	1	19:50 - 06:20
	2	19:48 - 06:22
	3	19:46 - 06:23
19/09/2011 – 21/09/2011	1	18:37 - 07:13
	2	18:34 - 07:14
	3	18.30-07.15

Table A2 Timings 30 minutes before sunset and 30 minutes after sunrise for the nights of static survey. Timings were calculated from sunset and sunrise times, obtained from www.dateandtime.com

Date	Wind speed	Wind direction	Rain	Cloud cover	Temperature (°C)
03/07/2011	0		0	2/8	15
08/08/2011	3	NW	0	3/8	11
20/09/2011	2	SW	2	4/8	8-10

Table A3 Weather conditions during transect surveys.

**LANDSCAPE AND VISUAL IMPACT
ASSESSMENT (LVIA)**

PROPOSED WIND TURBINE

**DRUMMICK
GLENALMOND**

Pegasus Planning Group
Pegasus House,
Querns Business Centre
Whitworth Road
Cirencester
Glos
GL7 1RT

Telephone: (01285) 641717 Facsimile: (01285) 642348

PPG Ref: DB/CIR.C.0362

Date: 26th January 2012

COPYRIGHT

The contents of this document must not be copied or reproduced in whole or in part without the written consent of **Pegasus Planning Group Ltd**

CONTENTS:

Page No:

1.	INTRODUCTION	3
2.	METHODOLOGY	4
3.	BASELINE CONDITIONS	4
	Statutory Landscape and Conservation Designations and Landscape Policies	5
	Loch Lomond and the Trossachs National Park	5
	Scheduled Monuments	6
	National Scenic Areas	6
	Conservation Areas	7
	Listed Buildings	7
	Historic Gardens and Designed Landscapes	7
	Non-statutory Classifications	8
	Public Access	8
4.	DESCRIPTION OF THE PROPOSALS	10
5.	PLANNING POLICY CONTEXT	11
	National Planning Policy	11
	Regional Planning Policy	12
6.	EFFECT ON LANDSCAPE CHARACTER	17
7.	EFFECT ON VISUAL AMENITY	22
	Loch Lomond and the Trossachs National Park	24
	Historic Gardens and Designed Landscapes	25
	Photoview 1 – View looking south west from Birnam Hill	26
	Photoview 2 – View looking west from Scone Palace Historic Garden	27
	Photoview 3 – View looking west from Kinnoul Hill, Perth	27
	Photoview 4 – View looking north west from Dunning	28
	Photoview 6 – View looking north north east from Tullibardine Collegiate Church, Auchterarder	29
	Nature and Sensitivity of Baseline View	29
	Photoview 7 – View looking north east from The Knock of Crieff	30
	Nature and Sensitivity of Baseline View	30
	Photoview 8 – View looking north west from residential properties at Sluidubh	30
	Sensitivity of Baseline View	30
	Photoview 9 – View looking south west from residential properties at Drummick	31
	Sensitivity of Baseline View	31
	Photoview 10 – View looking south east from the B8063	32
	Sensitivity of Baseline View	32
	Photoview 11 – View looking south east from residential properties at Harrietfield	32
	Sensitivity of Baseline View	33
	Photoview 12 – View looking north west from Roman Road at the A9	33
	Sensitivity of Baseline View	33
8.	EFFECT UPON LANDSCAPE FEATURES	36
9.	CUMULATIVE LANDSCAPE AND VISUAL EFFECTS	37
	Viewpoint 1 – View looking south west from Birnam Hill	40
	Viewpoint 2 – View looking west from Scone Palace Historic Garden	40
	Viewpoint 3 – View looking west from Kinnoul Hill, Perth	41
	Viewpoint 4 – View looking north west from Dunning	43

Viewpoint 5 – View looking north west from access track at base of Simpleside Hill	43
Viewpoint 6 – View looking north north east from Tullibardine Collegiate Church, Auchterarder	43
Viewpoint 7 – View looking north west from access track at base of Simpleside Hill	44
Viewpoint 8 – View looking north west from residential properties at Sluidubh	44
Viewpoint 9 – View looking south west from residential properties at Drummick	45
Viewpoint 10 – View looking south east from the B8063	46
Viewpoint 11 – View looking south east from residential properties at Harrietfield	46
Viewpoint 12 – View looking north west from Roman Road at the A9	47
10. CONCLUSIONS	49

APPENDICES

APPENDIX A	Site Layout and Location Plan
APPENDIX B	Detailed Assessment Methodology
APPENDIX C	Zone of Theoretical Visibility (ZTV) to Wind Turbine Blade Tip and Photoview Locations
APPENDIX D	Environmental Designations
APPENDIX E	National Character Areas (NCAs) and Local Landscape Character Area (LCA) Extracts
APPENDIX F	Photoview Wireframes and Photomontages
APPENDIX G	Cumulative ZTV and Wireframes
APPENDIX H	Landscape Mitigation Plan

1. INTRODUCTION

1.1 This Landscape and Visual Impact Assessment (LVIA) has been prepared by Pegasus Environmental; part of the Pegasus Planning Group. The report relates to a proposal for one wind turbine located in Drummick, Glenalmond (refer to Appendix A - Site Layout and Location Plan). This LVIA has been undertaken by a Chartered Member of the Landscape Institute (CMLI) and considers the potential effects of the proposed wind turbines upon:

- Landscape character
- Visual amenity
- Landscape elements such as vegetation, topography and watercourses

1.2 The main objectives of the LVIA are as follows:

- To identify, evaluate and describe the current landscape character of the site and its surroundings and also any notable individual landscape features within the site.
- To determine the sensitivity of the landscape to the type of development proposed.
- To identify potential visual receptors (i.e. people who would be able to see the development) and evaluate their sensitivity to the type of changes proposed.
- To identify and describe any effects of the development on the landscape and/or views and to evaluate the magnitude of change due to these effects.

Mitigation and Residual Effects

1.3 Best practice in the assessment of the effects requires that the significance of potential effects be assessed, mitigation proposals identified and the residual effect (with mitigation in place) then reassessed. As wind turbines are tall structures that require an open location, it is neither possible nor desirable to screen them with vegetation, as may be the case with other types of development such as industrial units. As a result there would be no difference between assessed potential effects and residual effects.

1.4 It is considered that the construction works would be short term in duration and that there would be no additional effects on the views.

1.5 It is also considered that there would be no residual effects once the wind turbine has been decommissioned and removed.

2. METHODOLOGY

- 2.1 This Landscape and Visual Impact Assessment (LVIA) has been undertaken in accordance with best practice guidelines (refer to Appendix B - Detailed Assessment Methodology).

3. BASELINE CONDITIONS

Description of the site

- 3.2 The proposed wind turbine is located on land known as Drummick situated approximately 1km south of the B8063 near Glenalmond. The Local Planning Authority is Perth and Kinross Council (PKC).
- 3.1 The proposed wind turbine with would be 50 metres to hub height and 77 metres to blade tip. The turbine blades and hub will be to standard manufacturer white finish. The tower would be a monopole constructed from galvanised metal.
- 3.2 Vehicular access to the wind turbines from the A822 would be via Buchanty onto the B8063 and then onto C classified Roads and the access track onto the site.
- 3.3 The proposed wind turbine would be located within fields currently used for grazing. The fields exhibit few perceptible high points and are distinctly level at approximately 200 metres Above Ordnance Datum (AOD).
- 3.4 Overhead pylon and transmission lines cross the fields and access track to the east of the proposed wind turbine forming a visually prominent vertical and horizontal element within the surrounding landscape.

Description of the surrounding area

- 3.5 The study area covers a 25 kilometre radius, measured from the turbine of the proposed development. The site including access tracks totals an area of 0.8ha. The study area falls within Perth and Kinross Council.
- 3.6 The site falls within an area of lowland between upland hills. The area is a mixture of pastoral and rough grazing landscape with a well developed network of hedgerows. Tree vegetation is predominantly limited to valleys and slopes with uplands and plateau being open and exposed with little if no vegetation.
- 3.7 The majority of the study area can be characterised as rural landscape with Perth and Crieff being the largest settlements with various scattered villages and hamlets

and many individual farmsteads. The biggest settlement, Perth is located approximately 10km east of the proposed development site, Crieff, the second largest settlement is located approximately 10km south west of the development site. Villages of Auchterarder, Dunning and Methven form part of the settlement pattern and are located respectively 12km to the south, 12km to the south south east and 7km to the east. Settlements are mostly located on the rolling uplands and in valley bottoms.

- 3.8 The study area is separated into north and south by the A85 which connects Crieff with Perth approximately 3km south of the development site and is dissected by a number of main roads and narrow rural roads often screened by hedgerows and trees. The B8063, approximately 1 kilometre north from the site, connects Methven with the A822 north of Crieff. The A9 flows from the M90 south west to north east and provides links between Stirling and Perth and then on to the north, at its closest point it is 10km south east from the development site. Other minor and rural roads pass across the study area.

Statutory Landscape and Conservation Designations and Landscape Policies

- 3.9 A review of relevant key statutory and non-statutory landscape classifications has been carried out as part of this LVIA. Landscape designations are one of the criteria that are considered when assessing the significance of an effect on the landscape resource and visual amenity. All landscapes have some importance, particularly to those people who live and work in them or use them for leisure activities so the qualitative evaluation of landscape is essentially a subjective matter. Landscapes can be designated by statute and are included in policies within developments plans, usually following a consultation process (which seeks to reach a consensus of opinion, thereby reducing the subjective element), in order to protect them from any development that may be to their detriment. Landscape classifications identify landscapes or elements within the landscape that are still recognised as being important by virtue of being marketed as attractions, or identified in non-statutory documentation in the public realm but have no protection in law. Within the study area there are few national and local designations that have been identified as the key designations relevant to the landscape and visual character of this study area. These are described below and are illustrated in Appendix D.

Loch Lomond and the Trossachs National Park

- 3.10 Loch Lomond and the Trossachs national park was established in July 2002 under the National Parks (Scotland) Act 2000 to safeguard an area of outstanding and diverse landscapes, habitats and communities, parts of which were coming under severe visitor and recreational pressures.
- 3.11 The National Park is located approximately 25km west from the centre of the proposed development at its closest. This designation contains many munros and corbetts, however only a very small portion of the eastern tip is included in the study area.

Scheduled Monuments

- 3.12 A scheduled monument is a monument of national importance that Scottish Ministers have given legal protection under the Ancient Monuments and Archaeological Areas Act 1979.
- 3.13 It is considered that only close proximity to a Scheduled Monument may potentially effect upon the designation or its settings. There are no Scheduled Monuments within a 2km radius of the development site.

National Scenic Areas

- 3.14 National Scenic Areas (NSAs) were designated in 1980 in recognition of their outstanding scenery and there are currently 40 in Scotland. Along with Scotland's two National Parks, they represent Scotlands finest landscapes.
- 3.15 There are two NSA's within the 25km study area, The closest being River Tay (Dunkeld) located 15km northeast of the site. At 20km to the west lies River Earn (Comrie to St Fillans).
- 3.16 The beauty of the River Tay (Dunkeld) area derives from the presence of the river between the rugged hills of the highland edge, which are clothed with a variety of different kinds of woodland, and the presence of a small and ancient ecclesiastical settlement. The area is peppered with lochans of varying size, many of which have been harnessed to human use and surrounded by broadleaved plantations.
- 3.17 River Earn (Comrie to St Fillans) lies in the upper part of Strathearn at the conjunction of highland and lowland scenery and the variety of landscape elements that derive from this combination result in a very distinctive character of pleasing appearance. There is a strong textured pattern resulting from the variety of

vegetation and landform. The hillsides are punctuated by rocky outcrops and patterned with heather, bracken, grass or plantation.

Conservation Areas

- 3.18 In Scotland, conservation areas are designated by local councils. They are designated for their special architectural and historic interest.
- 3.19 There are no conservation areas within close proximity to the proposed development. The only conservation area falling within 5km of the site is Fowlis Wester 4km to the southwest.

Listed Buildings

- 3.20 The authority for listing is granted by the Planning (Listed Buildings and Conservation Areas) Act 1997. LPA have primary responsibility for much of the work referred to, and Historic Scotland supports them in fulfilling that role.
- 3.21 Similarly to scheduled monuments, it is considered that only close proximity to a listed building may potentially affect the designation or its settings. There are two Grade A and 10 Grade B listed buildings within 5 kilometres of the proposed development. Listed buildings identified through desktop studies were Grade A and B only and those located within the 2 kilometre zone were likely to be affected by the proposed development due to screening effect of nearby vegetation.

Historic Gardens and Designed Landscapes

- 3.22 The inclusion of an historic park or garden on the Register in itself brings no additional statutory controls. However, local authorities are required by central government to make provision for the protection of the historic environment in their policies and their allocation of resources. Any proposals are referred to the Scottish Ministers (through Historic Scotland) and Scottish Natural Heritage.
- 3.23 There are 21 such designations within the study area however due to landform; vegetation; and distance from the site 15 of these are not thought to be effected by the development.
- 3.24 Keillour Castle is the closest registered park and garden (RPG) and is located approximately 3km from the site. The present Keillour Castle was built in about 1850 on the site of the earlier castle and incorporates in its basement remains of the latter. There are no other remains of the earlier structure. Keillour Castle is a predominantly

- woodland garden landscape, dominated by the steep gorge-side setting, and containing an important plant collection.
- 3.25 Abercairny (RPG) is located 5km south west of the site and the structure of the late-18th-century and early-19th-century designed landscape at Abercairny remains largely intact. There is parkland with specimen trees, a restocked early-19th-century flower garden and a mid-19th-century arboretum. Statuary and other ornamentation is a feature of the gardens.
- 3.26 Methven Castle (RPG) is located 6km to the east of the site and the designed landscape at Methven Castle consists largely of late-18th- and 19th-century parkland, woodland and shrubbery. The 19th-century shrubbery contains some surviving specimens from the pinetum which was planted in 1830 and is thought to be the earliest pinetum in Scotland. The late-18th-century walled garden is in separate ownership and part of the parkland is used for mineral extraction.
- 3.27 Scone Palace (RPG) is situated 14km east of the site. The extensive late-18th and early-19th century parkland at Scone Palace is well-preserved. Remnants of early-19th-century woodland survive along the burns in the policies. Formal terraced gardens, a pinetum and pleasure grounds with shrubberies and mature conifers date from the 19th century.
- 3.28 Monzie Castle is located 7km south west of the site and is an attractive 18th-century picturesque landscape overlaying an earlier more formal layout. There is a modified mid 19th-century revival formal garden attached to the tower house, and what is likely to be an early 18th-century mount.

Non-statutory Classifications

- 3.29 The following classifications have no legal weight but may be taken into consideration when formulating planning policy or considering proposed developments.

Public Access

- 3.30 Under Part 1 of the Land Reform (Scotland) Act 2003 there is a right of responsible non-motorised access, for recreational and other purposes, to land and inland water throughout Scotland with few exceptions.

- 3.31 There are no designated long distance recreational paths that fall within the study area. The closest one, Fife Coastal Path lies just outside the 25 kilometre radius. Therefore it was judged that any potential effects would not be significant and were not included in this report.
- 3.32 The Knock Walk part of the Crieff network of walks is located approximately 9km south west from the development site and offers users opportunities of panoramic views over mountain, moor and strath.
- 3.33 No public footpaths cross the site, however many public footpaths and bridleways cross the study area, forming a network of Public Rights of Way. This, in conjunction with Access Land and National Cycle Network offers great opportunities to enjoy the countryside.

Cycle Routes

- 3.34 Sustrans National Cycle Network Route 77 runs between Dundee and Pitlochry via Perth and at its closest point lies approximately 11km to the east of the site. North of Dunkeld it forks and Route 7 travels west to Aberfeldy 24km north of the site at its closest point.

4. DESCRIPTION OF THE PROPOSALS

- 4.1 The proposed development is for a single turbine located near Drummick, Perth and Kinross.
- 4.2 The proposed wind turbine 77m to blade tip is located to the west (295306, 726818) of Drummick (refer to Appendix A - Site Layout and Location Plan).
- 4.3 The height of the proposed turbine would be 77 metres to blade tip with a hub height of 50 metres and rotary diameter of 54 metres.
- 4.4 The wind turbine tower would be a tubular monopole galvanised metal, off-white in colour.
- 4.5 The generator (nacelle) and rotor blades would also be off-white in colour with a matt finish to reduce potential reflection.
- 4.6 Vehicular access to the wind turbines from the A822 would be via Buchanty onto the B8063 and then onto C classified Roads and the access track onto the site.
- 4.7 Spoil arising from the wind turbine foundations would be spread on adjacent ground and sown with grass seed.
- 4.8 Vehicular access to the wind turbines would be via the Buchanty to Fowlis Wester road and a proposed access track running from the road into the site.
- 4.9 No trees or hedgerows would be removed to accommodate the proposed wind turbine.
- 4.10 The wind turbine tower has been located 50 metres away from the nearest vegetation to provide a buffer for Bats.
- 4.11 The proposed wind turbine would have an intended 25-year lifespan and thereafter the land would return to agricultural use.

5. PLANNING POLICY CONTEXT

National Planning Policy

- 5.1 The National Planning Framework 2 (NPF2) was published in June 2009 and is a strategy for the long term development of Scotland's towns, cities and rural areas. It is very supportive of renewable energy, highlighting the important role that onshore windfarms have played, and will continue to play, in the roll out of renewables across Scotland. It outlines the renewable energy generation targets set by the Scottish Government (which have since been increased further) and acknowledges the importance of onshore wind farms in meeting this and future targets (of NPF2).
- 5.2 The Climate Change (Scotland) Act 2009 introduced ambitious legislation to reduce emission by at least 80 % by 2050. It also includes targets to generate 80% of Scotland's electricity from renewable sources by 2020 and an interim target of 31% by 2011.
- 5.3 The development is proposed as part of the response to targets by the Scottish Government to increase the proportion of electricity generated from renewable sources and hence reduce Scotland's contribution to climate change.
- 5.4 Scottish Planning Policy (SPP), Parts 1 and 2, outline the Scottish Government's vision of the purpose of planning and reflect the current Scottish Government targets for renewable energy generation. The full series of thematic SPPs were replaced in February 2010 by Scottish Planning Policy, which maintains a strong commitment towards renewable energy generation and supports the use of a mix of renewable energy generating techniques, including onshore windfarms.
- 5.5 The SPP Renewable Energy paragraph 184 states that planning authorities should *"support a diverse range of renewable energy projects"*.
- 5.6 Planning Policies recently consulted on by the Scottish Government are likely to require local authorities to determine what contribution they will make to meeting Scotland's renewable energy targets. Current proposals would also require them to identify broad areas of search, as well as pinpointing the areas that should be off-limits.
- 5.7 The Manifesto 2011 by the Scottish National Party brings the targets further and states that the renewable targets are to be raised to 100% by 2020.

Regional Planning Policy

Adopted Perth and Kinross Structure Plan (June 2003)

- 5.8 The Adopted Structure Plan (2003) provides a broad strategic land use planning guidance to 2020. The planning policies relevant to the development proposals are as follows:

Strategy 2: The Lowland Area

- 5.9 The strategy encourages, amongst other things, the economic use of minerals, renewable energy and forestry in support of rural diversification.

Environment and Resources Policy 1

- 5.10 The Council will seek to safeguard the long-term diversity and sustainability of species and natural and semi-natural habitats in Perth and Kinross.

Environment and Resources Policy 3

- 5.11 Proposed developments should not compromise the conservation objectives and overall integrity of National Scenic Areas unless there is a proven public interest where social or economic considerations outweigh the scenic quality and integrity of the area and development cannot be met in other less damaging locations.

Environment and Resources Policy 14

- 5.12 The policy states that Proposals for the development of renewable energy schemes will be supported where they are considered environmentally acceptable and where their energy contribution and benefits in reducing pollution outweigh any significant adverse effects on local environmental quality. Community based renewable energy developments in particular will be encouraged. Proposals for renewable energy schemes will be assessed against the following criteria:

- The immediate and wider impact of the proposed development on the landscape and wildlife resource;
- The need to protect features and areas of natural, cultural, historical and archaeological interest;

- The specific benefits that the proposal would bring to the local community and/or Perth and Kinross;
- The cumulative effects of similar developments on the local area.

5.13 An environmental assessment will normally be required for large-scale schemes and Local Plans will provide more detailed guidance particularly for wind farm developments and other renewable energy technologies.

Local Planning Policy

Perth & Kinross Proposed Plan (January 2012)

5.14 The newly adopted Perth & Kinross Proposed Plan provides the local planning guidance for development in the area. Those policies of interest to the determination of this application are as follows:

Policy PM1: Placemaking

5.15 The policy states that development must contribute positively, to the quality of the surrounding built and natural environment. All development should be planned and designed with reference to climate change, mitigation and adaptation.

Policy PM2: Design Statements

5.16 The policy states that Design Statements will normally need to accompany a planning application if the development covers an area greater than 0.5 hectares, or affects the character and/or appearance of a Conservation Area, Historic Garden, Designed Landscape, or the setting of a Listed Building or Scheduled Monument.

5.17 Planning permission will also not be granted for development that would be likely to have an adverse effect on species protected under the Wildlife and Countryside Act 1981 (as amended) unless the Council as Planning Authority is satisfied that:

- a) The development is required for preserving public health or safety, and, in the case of development affecting a species of protected bird;
- b) There is no other satisfactory solution.

Policy ER1A: Renewable and Low Carbon Energy Generation (New Proposals)

5.18 Proposals for the utilisation, distribution and development of renewable and low carbon sources of energy, including large-scale freestanding installations, will be supported where they are well related to the resources that are needed for their operation. In assessing such proposals the following factors will be considered:

- a) The individual or cumulative effects on biodiversity, landscape character, visual integrity, the historic environment, cultural heritage, tranquil qualities, wilderness qualities, water resources and the residential amenity of the surrounding area;
- b) The contribution of the proposed development towards meeting carbon reduction targets;
- c) The connection to the electricity distribution or transmission system;
- d) The transport implications, and in particular the scale and nature of traffic likely to be generated, and its implications for site access, road capacity, road safety, and the environment generally.
- e) The hill tracks and borrow pits associated with any development;
- f) The effects on carbon rich soils;
- g) Any positive or negative effects they may have on the local or Perth & Kinross economy either individually or cumulatively;
- h) The reasons why the favoured choice over other alternative sites has been selected.

Policy ER6: Managing Future Landscape Change to Conserve and Enhance the Diversity and Quality of the Area's Landscapes

5.19 Development and land use should be compatible with the distinctive characteristics and features of Perth & Kinross's landscapes. Accordingly, development proposals will be required to conserve and enhance the landscape qualities of Perth & Kinross. They will need to demonstrate that either in the case of individual developments, or when cumulatively considered alongside other existing or proposed developments;

- a) They do not erode local distinctiveness, diversity and quality of Perth & Kinross's landscape character areas, the historic and cultural dimension of the

area's landscapes, visual and scenic qualities of the landscape, or the quality of landscape experience;

- b) They safeguard views, viewpoints and landmarks from development that would detract from their visual integrity, identity or scenic quality;
- c) They safeguard the tranquil qualities of the area's landscapes;
- d) They safeguard the relative wildness of the area's landscapes;
- e) They provide high quality standards in landscape design, including landscape enhancement and mitigation schemes when there is an associated impact on a landscape's qualities;
- f) They incorporate measures for protecting and enhancing the ecological, geological or geomorphological, archaeological, historic, cultural and visual amenity elements of the landscape, and
- g) They conserve the experience of the night sky in less developed areas of Perth & Kinross through design solutions with low light impact.

Supplementary Planning Guidance

Energy Proposals in Perth & Kinross SPG (May 2005)

5.20 This SPG provides additional guidance for applicants and the Council in developing and determining proposals for renewable energy generation. In particular the SPG provides advice (which largely mimics the above referenced policy documents in relation to:

- Landscape Impact;
- Visual Impact;
- Cumulative Effects;
- Biodiversity and Ornithological Interests;
- Operational Impacts;
- Water Resources;

6. EFFECT ON LANDSCAPE CHARACTER

National Landscape Character (The Countryside Agency, 1999)

- 6.1 In 2002, together with the then Countryside Agency in England (now part of Natural England), Scottish Natural Heritage published Landscape Character Assessment: Guidance for England and Scotland.
- 6.2 Scottish Natural Heritage, in partnership with local authorities and others, undertook a national programme of Landscape Character Assessment (LCA) between 1994 and 1998. This assessment, which covers the whole of mainland Scotland and all of the main islands, identified around 4,000 different units of landscape character. These were grouped into 372 "Landscape Character Types". The proposed wind turbine is located within the Tayside Landscape Character Assessment Lowland Hills (TAY 6) and with close proximity to the Tayside Landscape Character Assessment Lowland River Corridors (TAY 7), Tayside Landscape Character Assessment Broad Valley Lowlands (TAY 10) and Tayside Landscape Character Assessment Highland Summits and Plateaux (TAY 3). (See Appendix E – Landscape Character Areas for full description).
- 6.3 The relevant key characteristics of the Lowland Hills (TAY 6) include:
- Low ridges and hills separating lowland straths and adjoining the nearby uplands;
 - Composed of soft, red sandstones;
 - Transitional character with pastures on lower slopes, giving way to rough grazing and even open moorland;
 - Evidence of several phases of historic settlement;
 - Extensive woodland, including forestry plantations; and
 - Influence of modern development.
- 6.4 The relevant key characteristics of the Lowland River Corridors (TAY 7) include:
- Well-defined river corridors in broader lowland landscapes;
 - Meandering, often incised course through softer sandstones;
 - Semi-natural woodland on steeper slopes; and
 - Rapids, weirs and mills where harder rocks cross the valley.
- 6.5 The relevant key characteristics of the Broad Valley Lowlands (TAY 10) include:

- Broad straths formed by glacial erosion;
- Undersized, misfit rivers;
- Complex local topography caused by glacial deposition;
- Distinctive red soils and red building stone;
- Influence of large estates, particularly in terms of woodland and policies;
- Dominance of arable and root crops; and
- Tree loss weakening landscape character.

6.6 The relevant key characteristics of the Highland Summits and Plateaux (TAY 3) include:

- Areas of upland separating the principal glens;
- West Highlands comprise a more extensive area of upland with spurs extending southwards; the hills are more rounded than those to the west and rock outcrops are fewer;
- Vegetation patterns closely reflect altitude and exposure and include heather, grassland, blanket bog and arctic alpine plant communities; variations reflecting the underlying geology;
- Most of the area managed as open moorland;
- Little or no settlement;
- Some extensive plantations; and
- One of the remotest and wildest landscapes in the UK.

Effect on Landscape Character

6.7 The location, siting and form of proposed wind turbine has been carefully considered and selected to minimise any harmful effects on landscape character or visual amenity of the wind turbine location and the surrounding landscape context.

6.8 The proposals and access requirements have been considered to retain the existing key landscape characteristics of the location, in particular the existing agricultural pastures and hedgerow enclosure pattern.

Effect on Landscape Character Type Lowland Hills (TAY 6)

- 6.9 These lowland hills form the transition between the Highlands to the north and west and the lowlands to the south and east. The transitional nature of the hills is reflected in the landcover and vegetation. Pastoral fields on the lower slopes give way to rough grazing then to open moorland as height gains. There is significant amount of coniferous forestry in this character type. There are several examples of major infrastructure including telecoms masts, pylons and transmission lines, the A9 corridor and the A85 Creiff to Perth road. The proposed wind turbine hub would be similar in height to the prominent pylons and transmission lines.
- 6.10 The low lying nature of the land and surrounding tree forestry on which the turbine would be located benefits from a degree of enclosure that aids in reducing visual sensitivity.
- 6.11 There would be no significant change to the physical characteristics of the surrounding area as identified within the landscape character assessments. Specifically, treecover, field pattern, and drainage patterns would be materially unaltered by the development. As such the proposals would be in accordance with the findings of the 'Landscape Study Windfarm development in the Ochil Hills and Southern Highland Perthshire' that confirms the Lowland Hills landscape is capable of accommodating "*sensitive wind windfarms*".
- 6.12 The proposed wind turbine would represent a high quality design within landscape character area that already contains major infrastructure and transport corridors.
- 6.13 Within the context of the landscape character area in which the proposed wind turbine is located, the rural and locally wooded characteristic of the landscape would remain largely unchanged. Therefore with a **medium/low sensitivity** and **low degree of change** there would be a **minor effect** on landscape character. All the characteristic elements of the landscape as quoted above would remain physically unaffected.

Effect on Landscape Character Type Lowland River Corridors (TAY 7)

- 6.14 LCT Lowland River Corridors is located approximately 1km north of the proposed site overall the Character Type is considered to be of high landscape value. Closest to the site this narrow section of Tay 7 is dominated by the deep valley that the River Almond has cut through the sandstone. Many of the slopes are too steep to farm and are clothed in broad leaved woodland. The presence of large houses and institutions such as Glenalmond College, echo the pattern of development seen along the Tay.

- 6.15 Due to the small portion of the Character Area that is in close proximity to the development and the enclosed nature of the landscape in this area there would be no significant change to the physical characteristics of the surrounding area as identified within the landscape character assessments. Specifically, tree cover, field pattern, and river course would be materially unaltered by the development.
- 6.16 Therefore with a **high sensitivity** and **negligible degree of change** there would be a **minor/ moderate effect** on landscape character. All the characteristic elements of the landscape as quoted above would remain physically unaffected.
- 6.17 It is worth noting that any effect would be upon less than 10% of the overall Character Type.

Effect on Landscape Character Type Broad Valley Lowlands (TAY 10)

- 6.18 At its closest point approximately 3km south of the development lies LCT Broad Valley Lowlands in this portion of LCT the landscape is very open forming a shallow valley between the lowland hills to the north and the smooth largely unwooded slopes of the Ochil Hills to the south. Woodland is generally limited to dense geometric blocks of conifers. In this large scale, open landscape, this woodland appears sculptural. Overall the LCT is dominated by the major urban corridors of the A9 and A94 that pass through the Character Type with little or no integration into the structure of the landscape.
- 6.19 Due to the small portion of the Character Area that is adjacent to the LCT in which the proposed turbine sits and the distance to the development coupled with the large open nature and surrounding hills there would be no significant change to the physical characteristics of the surrounding area as identified within the landscape character assessments. Specifically, tree cover, field pattern, and drainage patterns would be materially unaltered by the development.
- 6.20 Therefore with a **low sensitivity** and **low degree of change** there would be a **minor effect** on landscape character. All the characteristic elements of the landscape as quoted above would remain physically unaffected.

Effect on Landscape Character Type Highland Summits and Plateaux (TAY 3)

- 6.21 Approximately 4km north of the development lies LCT Highland Summits and Plateaux. This landscape type comprises the areas of upland separating the principal

- glens, to the north of the Highland Boundary Fault. This section of the LCT includes more extensive areas of upland plateau with rounded hills and limited outcrops.
- 6.22 Due to the limited visibility by landform and intervening vegetation and the moderate distance to the development there would be no change to the physical characteristics of the surrounding area as identified within the landscape character assessments and therefore any potential effects have not been assessed for this LCT.

7. EFFECT ON VISUAL AMENITY

Consultation

- 7.1 Perth and Kinross Council (PKC) have been consulted with regard to the location of representative photoviews, wireframes and photomontages (refer to Appendix C – Zone of Theoretical Visibility and Photoview Locations).

Zone of Theoretical Visibility (ZTV)

- 7.2 The Zone of Theoretical Visibility (ZTV) for wind turbine showing the potential visibility 'to hub and blade tip' at 50 metres and 77 metres respectively has been prepared (refer to Appendix C - Zone of Theoretical Visibility and Photoview Locations).
- 7.3 The ZTV for the turbine has been produced using the WindFarm software release 4.1 and generated using Landform Profile 50m Digital Terrain Modelling. Calculations include adjustments for the earth's curvature and light refraction. It is evident that the blade tip of the proposed turbine would be theoretically visible uniformly across the northern area within the 5 kilometre radius of the ZTV. Outside 5km there is limited, to no visibility from the north and scattered but slightly more significant visibility from the south. However, the model presents a 'worst case scenario' as it is based on a bare earth survey and does not take into account the screening provided by existing major infrastructure, buildings or woodland.

Colours

- 7.4 The proposed wind turbine would be painted a visual neutral colour. Such a colour is typically off-white. However, the visibility of the proposed wind turbine will vary in reality depending on the weather conditions but generally would not be considered to be incongruous.

Tree Cover

- 7.5 The extent of the wind turbine visibility is generally limited at close proximity by existing forestry along the valley floor including Murrays Hill Wood, Gorthy Wood and Drummend Wood as well as hedgerow field enclosures. Existing forestry including Keillour Forest and Long Plantation Wood limits short distance visibility to the south.
- 7.6 To the east visibility is limited by the built infrastructure of Perth and woodland including Old Scone Wood and the Muir of Thorn. To the west Low Moor Wood and woodland around South Buchanty restrict views.

- 7.7 Visibility is further limited by vegetation, individual trees and the built form relative to the receptors which would screen the wind turbine to varying degrees.
- 7.8 The screening, filtering and framing effect of vegetation and the vertical scale of pylons in the background reduces the perceived height and form of the proposed wind turbine. Due to surrounding landform and forestry the footing and lower tower of the wind turbine are not frequently visible.

Transport Corridors

- 7.9 Intermittent views of the wind turbines would potentially be visible from moving vehicles on the A9, A85 Creiff to Perth Road, the B8063, and the Glenalmond to Keillour road. These views, however, would often be restricted to glimpses and be transitory in nature (refer to Appendix F – Photoview 10 and 12).
- 7.10 The nearest public roads are located at the B8063 to the north of the site, Buchanty to Fowlis Wester minor road to the west, the Glenalmond to Keillour road to the east and the Fowlis Wester to Keillour road to the south of the development. A private road/track is located to the west through Gorthy Wood. Transient, intermittent and filtered views through dense forestry of the wind turbine would be permitted from these roads.
- 7.11 Route 77 of the National Cycle Network is located approximately 11km east of the site. Transient filtered views of the proposed turbine may theoretically be visible from a small section of this route as it heads north out of Perth. However the dense forestry and undulating landform combined with the distance from the site mean that the proposal will have no effect on these views.
- 7.12 There will no visibility of the turbine from National Cycle Network Route 77 located approximately 24km to the north.

Topography

- 7.13 There is potential for the wind turbine to be visible from the wider countryside. Outside 2km to the north visibility is limited by the Mounth Highlands and the steep sided valleys following the Glen Almond River. However, due to the medium-scale blade tip height of the 77 metres, the relatively low lying nature of the site compared to the surrounding landform, extensive tree and hedgerow cover, views of the proposed wind turbine would generally be restricted to higher ground beyond 5km to

the south. Where views are permitted from this direction, the wind turbine would be often partially visible behind forestry and viewed in the direct context of overhead pylons and transmission lines.

7.14 Whilst topography adjacent to the proposal is generally flat and the topography of the Mounth Highlands to the north restricts views, elevated ground is located approximately 14km to the south, in the form of the Ochil Hills. From these elevated photoviews where forestry does not limit views, wide panoramic views are permitted across the lowland hills below, with the proposed wind turbine forming a very small component of the view. With these panoramic views from elevated land, major infrastructure within the lowland is also apparent, including the pylons, transmission masts, telegraph poles, built infrastructure and the A9 dual carriageway. (refer to Appendix F – Photoview 3).

7.15 Consequently in more distant views, the proposed wind turbine would be assimilated into the wider landscape and it is considered that there is little potential for the development to result in significant effects on visual receptors over 5km from the development site.

Residential Properties

7.16 The nearest residential properties to the proposed wind turbine are located off the northern and southern side of the B8063 located approximately 1.3km directly to the north of the site. Sluidubh and Stroness House located over 600m to the south east and Drummick Farm and Drummick Cottage located over 560m and 510m respectively, to the north east on the Glenalmond to Keillour minor road (refer to Appendix F – Photoview 8 and 9) and a residence located 1.5km west of the site on the Buchanty to Fowlis Wester minor road. Potential views of the wind turbines would be seen in the context of pylons and transmission lines and heavily screened by mature forestry.

Environmental Designations

Loch Lomond and the Trossachs National Park

7.17 The proposed wind turbine is located approximately 25km to the east of the Loch Lomond and the Trossachs National Park. The (ZTV) shows there will be no visibility from this location. Due to the lack of visibility and the distance of the proposed wind turbine from the National Park, the proposed development would have no effect.

National Scenic Areas

- 7.18 The closest NSA to the proposed development is the River Tay (Dunkeld) located 15km northeast of the site. At 20km to the west lies River Earn (Comrie to St Fillans), the ZTV shows no theoretical visibility from the River Tay NSA and theoretical visibility from only the highest point, about 1/10th of the River Earn NSA. Lack of visibility and long distance to the proposed turbine mean that the development would have no effect of either designation.

Historic Gardens and Designed Landscapes

- 7.19 The Historic Gardens and Designed Landscapes of, Keillour Castle; Abercairny; and Methven Castle are not open to the public. Closer investigation of the ZTV shows that there will be no visibility from Abercairny and Keillour and mature forestry will screen views from the small portion of Methven Castle where the development is theoretically visible.
- 7.20 Scone Palace (RPG) is situated 14km east of the site. Due to the mature trees around the Palace and the surrounding landform and vegetation there is limited to no visibility of the proposed development as shown in (Appendix F - photoview 2).
- 7.21 Monzie Castle is located 7km south west of the site, due to the surrounding landform there is no visibility of the proposed development.
- 7.22 Due to visibility and distance the proposed development would have no effect on any of the Historic Gardens and Designed Landscapes designations within the 25km study area.

Conservation Areas

- 7.23 The proposed wind turbine is located within 4km of designated a Conservation Area located in Fowlis Wester to the south west. The proposals would not be visible from this designation and would not significantly alter the visual setting.

Listed Buildings

- 7.24 The proposed wind turbine is located within 5km of Listed A and B Buildings and Structures, including Trinity College main building 3km to the north east, Williamston House 5km to the south east, Carsehead Farmhouse, Inchaffray Abbey, Parish Church of Madderty and Woodened House to the south, the Parish Church and

Churchyard in Fowlis Wester located to the south west and Tulchan Gardens, Bridge of Buchanty and Glenalmond House to the north.

- 7.25 Due to landform, distance to site and intervening vegetation the proposal would not significantly alter the visual setting of these designations.

Photoviews

- 7.26 Following desk top analysis, field survey and interpretation of the Zone of Theoretical Visibility (ZTV) a series of photoviews regarded as representative of a range of views and visual receptors have been selected. The locations of the representative photoviews were verified by Perth and Kinross Council (PKC). The photoviews are not intended to cover every possible view, but are intended to be representative of a range of visual receptors including residents, walkers on public footpaths, and road users. Views from the nearest elevated residential areas including Dunning approximately 15km to the south east and Harrietfield approximately 4km to the north-east have also been included.
- 7.27 A visual assessment of the wind turbine has been undertaken at each of the selected photoviews (refer to Appendix F - Photoviews, Wireframes and Photomontages).

Photoview 1 – View looking south west from Birnam Hill

Sensitivity of Baseline View

- 7.28 The viewpoint is representative of visitors of views from the top of Birnam Hill which is the highest peak in the study area. The viewpoint is approximately 15km from the location of the proposed wind turbine. As an important viewing point the receptor has a high sensitivity.

Magnitude of Visual Effect

- 7.29 Due to weather conditions a photograph from this location was unable to be taken. Review of the wireframe created from this location shows the turbine, from this distance would appear as a very small vertical element in an expansive view. Due to the separating distance to the turbine the magnitude of change is assessed as being low.

Significance Effects on View

- 7.30 With a high sensitivity and a low magnitude of change there would be a **moderate/minor** effect as a result of the proposed development.

Photoview 2 – View looking west from Scone Palace Historic Garden

Sensitivity of Baseline View

- 7.31 The viewpoint is representative of visitors to Scone Palace and its gardens. The viewpoint is approximately 15.9km from the location of the proposed wind turbine. As an important public site the receptor has a high sensitivity.

Magnitude of Visual Effect

- 7.32 Due to the mature nature of the woodland planting within the gardens the turbine would be partially obscured by vegetation from views from the house itself. From other areas of the garden there may be filtered views of the turbine tip at its most vertical point over the more distant intervening vegetation. Due to the topography of the landform the majority of the gardens in front of the house are lower than the house itself and therefore views towards the turbine would be screened by vegetation. From the portion of the garden to the south west of the house which is at a higher elevation views towards the turbine would be screened by a line of large mature trees that divide the garden in this location. At 15km away where there are limited views the proposed wind turbine tip it would appear as an indiscernible element within the landscape vegetation. The magnitude of change is assessed as being **low**.

Significance Effects on View

- 7.33 With a high sensitivity and a low magnitude of change there would be a **moderate/minor** effect as a result of the proposed development.

Photoview 3 – View looking west from Kinnoul Hill, Perth

Sensitivity of Baseline View

- 7.34 This view is taken from the public footpath/trail that does a circuit to the top of Kinnoul Hill located 18.7km from the location of the proposed wind turbine. As a public right of way and recognized well used walk the receptor is assessed as having a **high sensitivity**.

Magnitude of Visual Effect

- 7.35 The proposed wind turbine would appear as an element in the centre of the wide expansive view against the backdrop of the Mounth Highlands which rise up in the distance and help to blend the turbine in to the landscape. The heavily built up urban infrastructure of Perth forms the prominent element on the valley floor from this

location. The turbine, from this distance would be smaller in scale and height to other elements in the wider landscape in particular the vegetation covering Kinnoul Hill and the built structures of Perth itself. The magnitude of change is assessed as being **low**.

Significance Effects on View

- 7.36 With a high sensitivity and a low magnitude of change there would be a **moderate/minor** effect as a result of the proposed development.

Photoview 4 – View looking north west from Dunning

Sensitivity of Baseline View

- 7.37 This view is taken looking north west from the minor road rising south east of Dunning approximately 15.9km from the location of the proposed turbine. Although not typical of views from Dunning itself it is representative of views from a small number of properties close to this location. As a residential area the receptor has a **high sensitivity**.

Magnitude of Visual Effect

- 7.38 From this location the view is a panoramic one of the surrounding area. The landscape is perceived as well wooded with patches of built farmland infrastructure and settlements inter dispersed with open fields. Telegraph poles are the dominant vertical elements in the foreground of the view. In contrast the proposed wind turbine though visible, is perceived as a small scale element in the landscape located within mature woodland and against the backdrop of the Mounth Highlands which rise up in the distance and help to blend the turbine in to the landscape. Therefore the magnitude of change brought about by the proposed wind turbine is assessed as being **low**.

Significance Effects on View

- 7.39 With a high sensitivity and a low magnitude of change there would be a **moderate/minor** effect as a result of the proposed development.

Photoview 5 – View looking north west from access track at base of Simpleside Hill

Sensitivity of Baseline View

This view is taken from access track/ bridleway to Simpleside Hill looking north at approximately 14km from the location of the proposed turbine. The view is representative of users of the track. As a public recreational track the receptor has a **high sensitivity**.

Magnitude of Visual Effect

- 7.40 From this location large open fields follow the undulation of the landform with patches of mature woodland forming the prominent vertical elements in the patchwork of field boundaries. There is evidence of human influence on the landscape in the form of farm buildings and dispersed settlements. The proposed wind turbine though visible, is perceived as a relatively small scale element in the landscape located in the far distance with the electricity pylons that cross the development site forming similar scale vertical elements close by. Both turbine and pylons are seen against the backdrop of the Mounth Highlands which rise up beyond and help to further reduce the vertical scale of the turbine within the landscape. Seen in this context, the proposed wind turbine is assessed as having a **low** magnitude of change to the view.

Significance Effects on View

- 7.41 With a high sensitivity and a low magnitude of change there would be a **moderate/minor** effect as a result of the proposed development.

Photoview 6 – View looking north north east from Tullibardine Collegiate Church, Auchterarder

Nature and Sensitivity of Baseline View

- 7.42 The viewpoint is representative of visitors to the Grade A listed church. The viewpoint is approximately 14km from the location of the proposed wind turbine. As an important public site and listed building the receptor has a **high sensitivity**.

Magnitude of Visual Effect

- 7.43 Mature woodland forms the main vertical element across the entire view from this location and restricts visibility to just the nearby fields in the foreground and the Mounth Highlands in the distance. The proposed turbine would appear to sit in one of the clumps of woodland that cover the low lying land of the highlands and forms a small element in the view seen against the backdrop of the Mounth Highlands, which rise up beyond and help further reduce the size of the turbine within the landscape. The magnitude of change to the view would be **low**.

Significance Effects on View

- 7.44 With a high sensitivity and a low magnitude of change there would be a **moderate/minor** effect as a result of the proposed development.

Photoview 7 – View looking north east from The Knock of Crieff

Nature and Sensitivity of Baseline View

- 7.45 This view is taken from the public footpath/trail that does a circuit to the top of The Knock located 8.3km from the location of the proposed wind turbine. As a public right of way and recognized well used walk the receptor is assessed as having a **high sensitivity**.

Magnitude of Visual Effect

- 7.46 Whilst there are open views to the south east and south west from this location the peak of The Knock is covered by dense mature evergreen woodland which limits views to the north east to the lower levels of the trail. Whilst the ZTV shows the turbine is theoretically visible from this location it doesn't take into account any vegetation or built infrastructure. Once a clear opening from the woodland with views towards the site is found the intervening landform blocks views of the turbine. Telecom masts form the prominent vertical elements in the view and break the horizon line in the middle and far distance. Due to the fact that the turbine is not visible from this location the magnitude of change to the view would be **negligible/none**.

Significance Effects on View

- 7.47 With a high sensitivity and a negligible/none magnitude of change the proposed wind turbine would have a **minor/moderate** effect on the visual receptor.

Photoview 8 – View looking north west from residential properties at Sluidubh

Sensitivity of Baseline View

- 7.48 This photoview is taken from residential properties at Sluidubh. The view is representative of residential properties at Sluidubh which are located 588m from the location of the proposed wind turbine. Views from residential dwellings have a **high sensitivity**.

Magnitude of Visual Effect

- 7.49 Given the close proximity the size of the proposed turbine will be notable in the view. The vertical form of the closer existing wooden poles will be a similar scale to the proposed turbine and therefore reduce the magnitude of change. The majority of the turbine tower will be screened by an existing clump of mature conifer trees. The hub and all three blades will be visible above the tops of the trees. The turbine, will form a large vertical element in the existing view, and through its rotation, the turbine rotors will introduce visual movement. The close proximity to the turbine and its apparent size in the view would result in a **high** magnitude of change.
- 7.50 As part of the mitigation measure of the development it is proposed to plant a native mix of mature evergreen and deciduous trees (Scotch Pine, Mountain Ash and Birch) to help screen views of the proposed turbine from the properties at this location, this can be seen in Appendix H – Landscape Mitigation Plan. The proposed trees will take a few years to grow to a size where they will effectively screen the turbine from this property, subject to the maturity of the planted trees.

Significance of Visual Effect

- 7.51 With a high visual sensitivity and a high magnitude of change, there would be a **major** visual effect. However, with the landscape mitigation in place this effect would gradually decrease over the years finally becoming **moderate/minor** once the trees are mature enough to screen views to the proposed turbine.

Photoview 9 – View looking south west from residential properties at Drummick

Sensitivity of Baseline View

- 7.52 This photoview is taken from residential properties at Drummick. The view is representative of residential properties at Drummick which are located 521m from the location of the proposed wind turbine. Views from residential dwellings have a **high sensitivity**.

Magnitude of Visual Effect

- 7.53 From this location the size of the proposed turbine will be notable in the view breaking the horizon line over the woodland beyond. The close by electricity pylon sits on higher ground and appears slightly larger in scale than the proposed turbine and therefore helps to visually reduce its vertical effect. The turbine sits behind the electricity cables which cross the entire view in this location. The whole turbine including blades and tower are visible, it forms a large vertical element in the existing

view and through its rotation, the turbine rotors will introduce visual movement. Due to the pylon detracting from the visual effect, the close proximity to the turbine and its apparent size in the view would result in a **medium** magnitude of change.

Significance of Visual Effect

- 7.54 With a high visual sensitivity and high magnitude of change, there would be a **major/moderate** visual effect.

Photoview 10 – View looking south east from the B8063

Sensitivity of Baseline View

- 7.55 This photoview is taken from the B8063, west of Buchanty. The view is located 3.5km from the proposed turbine and is representative of road users between the A822 and Glenalmond. Views from road users have a **medium sensitivity**.

Magnitude of Visual Effect

- 7.56 Views of the proposed development from the B8063 would be transitory in their nature with the turbine being visible between openings in the intervening vegetation. From this location a line of pylons form prominent vertical structures that break the horizon line as they pass over the undulating landform in the centre of the view. The vegetation to the left of the view is dense and mature with wooden poles and pylons showing the human influence on the area. As the vegetation becomes less dense towards the centre of the view and to the right individual mature trees stand out against the sparse landscape. Given the moderate distance of the viewpoint, the size of the proposed turbine would be notable in the view. However the vertical form of the existing pylons and mature trees close by are similar scale elements to the proposed turbine, reducing the magnitude of change that would occur. There would be a **low** magnitude of change given the presence of intervening vegetation and built elements that softens the visual scale of the wind turbine.

Significance of Visual Effect

- 7.57 With a medium visual sensitivity and a low magnitude of change, there would be a **minor/moderate** visual effect. Given that the views of the turbine will be transitory in nature and with landform and vegetation offering only glimpsed views this can be reduced to a **minor** visual effect from the B8063.

Photoview 11 – View looking south east from residential properties at Harrietfield

Sensitivity of Baseline View

- 7.58 This photoview is taken from residential properties at Harrietfield. The view is located 4.1km from the proposed turbine and representative of residential properties on the southern edge of the settlement. Views from residential dwellings have a **high sensitivity**.

Magnitude of Visual Effect

- 7.59 The photograph was taken at the most open point on the southern periphery of Harrietfield. Unfortunately when the montage was produced the turbine is screened by one of the properties on the south side of the village. For the purposes of this assessment it is assumed that the photo was taken from a location where views to the turbine were unobstructed.
- 7.60 The wind turbine would potentially be visible from properties on the southern and most edges of the village, views from the majority of properties on the villages eastern most periphery would be screened by existing vegetation. Views from other properties within Harrietfield would be screened by the built infrastructure of the village itself. Where views are unobstructed the majority of the turbine tower and hub would be screened by distant dense intervening woodland. The turbine blades in their most vertical position would be seen above the tree line on the horizon and would form a small element in the overall view. Due to the intervening vegetation, built elements and the limited number of properties that would experience the view there would be a **low** magnitude of change.

Significance of Visual Effect

- 7.61 With a high visual sensitivity and a low magnitude of change, there would be a **moderate/minor** visual effect.

Photoview 12 – View looking north west from Roman Road at the A9

Sensitivity of Baseline View

- 7.62 This photoview is taken from Roman Road which feeds the A9, near Crossgates. The view is located 11km from the proposed turbine and is representative of road users between Perth and Crossgates. Views from users of A roads have a **low sensitivity**.

Magnitude of Visual Effect

- 7.63 Views of the proposed development from Roman Road would be transitory in their nature with the turbine being visible between openings in the intervening vegetation. From this location the wind turbine would be screened by intervening woodland. Due to the turbine not being visible there would be a **negligible/none** magnitude of change.

Significance of Visual Effect

- 7.64 With a low visual sensitivity and a negligible/none magnitude of change, there would be a **negligible/none** visual effect.

Summary

- 7.65 It is evident from this assessment that whilst the ZTV appears extensive, to the south east the actual zone of visibility, or the visual envelope, associated with the proposed wind turbine would be restricted and views would generally be limited in number. This is due to combination of the topography and the layering effect of existing intervening vegetation and structures.
- 7.66 Other than in the closest view from Drummick, where the proposed wind turbine is visible it will only be a partial view with the base of the turbine tower screened from view by intervening vegetation. Consequently, the perceived scale of the turbine will be reduced.
- 7.67 From public highways and public rights of way, views will typically be transitory ones.
- 7.68 Within views over 5 kilometres from the landownership boundary, the proposed wind turbine would be seen only as one element within a wider panoramic and composite landscape that already contains a number of existing infrastructure elements and features.
- 7.69 Of the 12 viewpoints selected for the assessment a major/moderate effect has been identified in the context of only two views, from Sluidubh and Drummick both located within 600m of the turbine to the south east and north west respectively. Additional landscape mitigation has been proposed for the properties at Sluidubh which would help to screen views from this location. The mitigation measures would result in a reduction of effect from Sluidubh to moderate/minor. It is worth noting that the visual effects of the proposed development are limited to a very small area for a scheme of this nature.

7.70 It is worth noting that in views from Drummick the turbine would be seen in relation to the electricity pylons and wooden poles that cross the site in this location. These elements are tall vertical structures that define the local landscape and help to reduce the visual effect of the turbine.

7.71 Although there would be some visual change at the local level it would not necessarily be a harmful one, merely slightly different to that which exists now. Any scheme involving renewable energy in the form of turbines will be visible to some degree.

8. EFFECT UPON LANDSCAPE FEATURES

Topography

- 8.1 The proposed wind turbine has been designed to be integrated with the existing topography and ground levels would remain unchanged.

Trees and Hedgerows

- 8.2 No trees or hedgerows would be removed from the site in order to accommodate the proposed wind turbine.

Herbaceous Vegetation

- 8.3 The location of the proposed wind turbine is currently, land used for grazing. Consequently there would be no significant effect on any herbaceous material within the landownership boundary.

Water Features

- 8.4 There are no water features, which would be affected by the proposed wind turbine.

Summary

- 8.5 It is therefore evident that the proposed wind turbine would not harm the landscape elements or features associated with the locality.

9. CUMULATIVE LANDSCAPE AND VISUAL EFFECTS

- 9.1 In order to assess the cumulative effect of the proposed development, a number of other wind farm developments within a 25 kilometre radius of the proposed wind turbine location have been identified. Due to the nature of the wider study area, it is considered that significant cumulative effects would be unlikely beyond 25 kilometres.
- 9.2 Other wind farm developments include operational ones, ones in construction and consented schemes. Small scale wind turbines, less than 30 metres in height, have not been included within the cumulative assessment as it is considered that these would not give rise to significant cumulative effects.
- 9.3 Wind Farm developments that are in the planning stage have not been included in this cumulative assessment, due to the unresolved outcome of the applications. It is typical to include developments at the planning stage however due to the number of applications in planning at the time of writing; this was beyond the scope of this report.
- 9.4 A total of six wind farms have been identified within 25 kilometres of the proposed Drummick wind turbine. These are given in the following table:

	Site	Planning Authority	No. of Turbines	Height of Turbines	Estimated MW	Distance from Site
Operational/Construction						
A	Burnfoot Hill	Perth and Kinross	13	100m	26MW	23.4 kilometres
B	Green Knowes	Perth and Kinross	18	98.5m	27MW	18.8 kilometres
C	Lochelbank	Perth and Kinross	12	91m	9.6MW	19.9 kilometres
D	Griffin Forest	Perth and Kinross	68	124m	204MW	15.7 kilometres
E	Stewart Tower	Perth and Kinross	1	47.5	100KW	15.8 kilometres
Consented						
F	Calliacher	Perth and Kinross	14	109.8	32MW	18.9 kilometres

Effect on Landscape Character

- 9.5 Of the six wind farm developments identified within the cumulative assessment, only the Stewart Tower turbine is located within the Landscape Character Tay 6: Lowland Hills in which the proposed Drummick wind turbine is located.
- 9.6 Stewart Tower is located over 15km from Drummick and is a small turbine at 47.7m to tip. Consequently there will be no additional physical change to the local landscape character.
- 9.7 The operational Griffin Forest and consented Calliacher wind farms are located approximately 16 kilometres and 17 kilometres north west, respectively, from the proposed Drummick wind turbine, and lie within the boundary of the Tay 3 Highland Summits and Plateaux character type.
- 9.8 The operational Green Knowes and Lochelbank wind farms, lie approximately 18 kilometres south and 21 kilometres south east, respectively, of the proposed turbine at Drummick.
- 9.9 The operational Burnfoot Hill wind farm, lies approximately 23 kilometres south of the proposed turbine at Drummick.
- 9.10 The direct effects on the character of the landscape surrounding each of the wind farms would give rise to a 'wind farm' landscape in the immediate vicinity of each site where the turbines become the principal defining element of landscape character, and also a wind farm sub-type within the local area of each site. In the case of the Drummick proposal this would give rise to a 'wind farm' landscape within approximately 400m of the turbine. This 'wind farm' landscape would remain disconnected from any of the other 'wind farm' landscapes assessed.
- 9.11 At distances up to approximately 2-3km from the Drummick Turbine the existing landscape sub-type 'Lowland Hills with Wind Turbine' would remain the same. Cumulative landscape effects on landscape character arising from Drummick are not predicted beyond Lowland Hills.
- 9.12 The addition of the Drummick wind turbine in combination with the operational Burnfoot Hill, Green Knowes, Lochelbank, Griffin Forest and consented Calliacher wind farms increases the presence of renewable energy infrastructure within the

landscape. However, due to the separating distance, it is not anticipated that there will be a notable change in the defining characteristics of the landscape.

- 9.13 Within the context of the landscape character area in which the proposed wind turbine is located, the rural and locally wooded characteristic of the landscape would remain largely unchanged. Therefore with a **medium/low sensitivity** and **low degree of change** there would be a **minor cumulative effect** on landscape character. As the characteristic elements of the landscape would remain physically unchanged, the overall cumulative effect on landscape character is considered to be **minor**.

Effect on Visual Amenity

- 9.14 The cumulative assessment is primarily based upon the 12 viewpoints used for the visual assessment as agreed with Perth and Kinross Council and assesses the 90 degree field of view, centred on the proposed turbine and then the full 360 degree view considering the combined or successive effect as defined within the document 'Cumulative Effects of Windfarms – Version 2' (2005) SNH. This is defined as:

“Combined visibility may either be in combination (where several windfarms are within the observer’s arc of vision at the same time) or in succession (where the observer has to turn to see the various windfarms).”

- 9.15 While the 12 viewpoints offer a range of representative views around the site, they do not cover all possible views.
- 9.16 Due to the nature of the study area and the location and separation distance between the six wind farms, it is not anticipated that cumulative views are likely to be afforded containing all six wind farms. Where any views are afforded, due to the distance over which the developments will be viewed, they are not anticipated to all be easily discernable within the view.
- 9.17 Due to the location and altitude of some of the viewpoints, there is the potential to view two or more developments within the same view. However where views are afforded they are anticipated to be distant, glimpsed and framed views, with one, two or all of the developments largely screened by intervening landform, built form, and/or vegetation.
- 9.18 The Zone of Theoretical Visibility (ZTV) for the wind turbine showing the potential visibility to blade tip at 77 metres combined with the other wind farms in the

cumulative assessment has been prepared (refer to Appendix G – Cumulative Zone of Theoretical Visibility).

- 9.19 Cumulative wireframes have been produced for all viewpoints where the proposals will be viewed in conjunction with an additional wind farm (Appendix G – Cumulative wireframes). Taking each viewpoint in turn the cumulative assessment is as follows:

Viewpoint 1 – View looking south west from Birnam Hill

- 9.20 The Cumulative Wireframes 1a – 1d indicate that the following baseline and consented wind farms would be potentially visible at this position.

Windfarm	Approximate Distance	Direction
Drummick (proposed)	15km	SW
Burnfoot Hill (operational)	38.5km	SW
Green Knowes (operational)	33km	S
Lochelbank (operational)	27.30km	SE
Stewart Tower (construction)	6.9km	SE
Griffin Forest (construction)	7.1km	E
Calliacher (consented)	18km	E

- 9.21 Green Knowes wind farm is located approximately 30 kilometres south of the view, and the seventeen turbines are theoretically visible within the wireframe. Burnfoot Hill Wind farm is located approximately 38.5 kilometres to the south west of the view and thirteen turbines are theoretically visible within the wireframe. Calliacher and Griffin Forest are visible to the north west at 18km and 7.1 km respectively and from this location they appear as one large wind farm taking up 30° of the 90 degree view. Lochelbank and Stewart Tower are located 27.30km and 6.9km respectively to the south east and are not visible in the same 90 degree view as Drummick. When, Green Knowe, Burnfoot and Drummick appear together they occupy a small horizontal angle within the 90 degree view. Due to the separation between the viewpoint and the wind farms they appear only as minor often indiscernible elements within the panoramic view. Therefore as a result of the proposed development there is a **minor cumulative effect**.

Viewpoint 2 – View looking west from Scone Palace Historic Garden

- 9.22 The Cumulative Wireframes 1a - 1d indicate that the following baseline and consented wind farms would be potentially visible at this position.

Windfarm	Approximate Distance	Direction
Drummick (proposed)	15.9km	SW
Lochelbank (operational)	12.4km	S
Griffin Forest (construction)	22.3km	NW
Stewart Tower (construction)	9.7km	NW
Green Knowes (operational)	23.3km	SW

9.23 There is no theoretical visibility of any other wind farms in the 90 degree view looking towards the proposed Drummick turbine.

9.24 Lochelbank wind farm is located approximately 12.4 kilometres south of the view and there are eleven turbine tips and six hubs are theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening land form and vegetation, it is not anticipated that Lochelbank wind farm will be discernable within the view.

9.25 Griffin Forest wind farm is located approximately 22.3 kilometres to the north west of the view and eleven turbine tips and eight hubs are theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening land form and vegetation, it is not anticipated that Griffin Forest or Green Knowes wind farms will be discernable within the view. Stewart Tower at 9.7km is the closest turbine to the viewpoint however due to intervening vegetation, in reality will not be visible.

9.26 The addition of the Drummick turbine (c. 15km) to the baseline would result in a **minor cumulative effect** at this viewpoint.

Viewpoint 3 – View looking west from Kinnoul Hill, Perth

9.27 The Cumulative Wireframes 1a - 1d indicate that the following baseline and consented wind farms would be potentially visible at this position.

Windfarm	Approximate Distance	Direction
Drummick (proposed)	15.4km	W
Burnfoot Hill (operational)	30.1km	SW

Windfarm	Approximate Distance	Direction
Green Knowes (operational)	21.7km	S
Lochelbank (operational)	8.9km	W
Griffin Forest (construction)	26.6km	NW
Stewart Tower (construction)	13.9km	NW
Calliacher (consented)	34.3km	NW

- 9.28 In the 90 degree view looking towards Drummick, Griffin Forest wind farm is located approximately 26.6 kilometres north west of the view, and the 52 turbine tips and 24 hubs are theoretically visible within the wireframe. Calliacher consented Wind farm is located approximately 34.3 kilometres to the north west of the view and two turbine tips are theoretically visible within the wireframe. When viewed from this location the Calliacher turbine tips would be indistinguishable on the horizon line and therefore have no effect on the view. Griffin Forest wind farm is visible on the distant hillside within a forest of mature trees, which screen the hubs and towers from this location. The tips of the turbines that are visible in the view are seen as minor elements within the panoramic view, and are so distant as to be barely perceivable.
- 9.29 Looking to the north west Stewart Tower is theoretically visible, however, due to its size and against the backdrop of hills and forestry at a distance of 13.9km the turbine will be barely perceivable in the view.
- 9.30 Looking towards the south west Green Knowes and Burnfoot Hill are theoretically visible at 21.7km and 30.1km respectively. Green Knowes can be seen on the horizon but due to the distance the turbines appear as minor elements in the panoramic view. The Burnfoot Hill turbines appear to be grouped with Green Knowes wind farm and are barely perceivable in the view.
- 9.31 Looking to the south Lochelbank wind farm is theoretically visible at 8.9km. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening land form and vegetation, it is not anticipated that Lochelbank wind farm will be discernable within the view.
- 9.32 The addition of the Drummick turbine (c. 15.4km) to the baseline would result in a **moderate/minor cumulative effect** at this viewpoint.

Viewpoint 4 – View looking north west from Dunning

- 9.33 The Cumulative Wireframes 1a - 1d indicate that the following baseline and consented wind farms would be potentially visible at this position.

Windfarm	Approximate Distance	Direction
Drummick (proposed)	15.9km	NW
Griffin Forest (construction)	30.5km	N
Stewart Tower (construction)	23.4km	N

- 9.34 Griffin Forest Wind farm is located approximately 30.5 kilometres north west of the viewpoint. Six turbine tips and 3 hubs are theoretically visible within the wireframe. These will be seen as minor elements within the panoramic view, and are so distant as to be barely perceivable. Stewart Tower is theoretically visible at 23.4km, but due to the turbine size and intervening vegetation it is not anticipated that Stewart Tower will be discernable in the view. The addition of the Drummick turbine (c. 15.9km) to the baseline would result in a **minor cumulative effect** at this viewpoint.

Viewpoint 5 – View looking north west from access track at base of Simpleside Hill

- 9.35 There would be no other wind farm developments visible within the view. Therefore there would be **no cumulative effects** to the baseline as a result of the proposed development

Viewpoint 6 – View looking north north east from Tullibardine Collegiate Church, Auchterarder

- 9.36 The Cumulative Wireframes 1a - 1d indicate that the following baseline and consented wind farms would be potentially visible at this position.

Windfarm	Approximate Distance	Direction
Drummick (proposed)	14km	NE
Green Knowes (operational)	8.4km	SE
Lochelbank (operational)	20km	E

- 9.37 There is no theoretical visibility of any other wind farms in the 90 degree view looking towards the proposed Drummick turbine.
- 9.38 Lochelbank wind farm is located approximately 20 kilometres east of the view and there is one turbine theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening infrastructure and vegetation, it is not anticipated that Lochelbank wind farm will be discernable within the view.
- 9.39 Green Knowes wind farm is located approximately 8.4 kilometres to the south east of the view and eleven turbine tips and two hubs are theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening land form, infrastructure and vegetation, it is not anticipated that Green Knowes wind farm will be discernable within the view.
- 9.40 Due to the lack of visibility of other wind farms the addition of the Drummick turbine (c. 14km) to the baseline would result in a **no cumulative effect** at this viewpoint.

Viewpoint 7 – View looking north west from access track at base of Simpleside Hill

- 9.41 There would be no other wind farm developments visible within the view. Therefore there would be **no cumulative effects** to the baseline as a result of the proposed development

Viewpoint 8 – View looking north west from residential properties at Sluidubh

- 9.42 The Cumulative Wireframes 1a - 1d indicate that the following baseline and consented wind farms would be potentially visible at this position.

Windfarm	Approximate Distance	Direction
Drummick (proposed)	588m	W
Burnfoot Hill (operational)	23.4km	S
Green Knowes (operational)	18.8km	S
Lochelbank (operational)	19.9km	SE

- 9.43 There is no theoretical visibility of any other wind farms in the 90 degree view looking towards the proposed Drummick turbine.
- 9.44 Burnfoot Hill wind farm is located approximately 23.4 kilometres south of the view and there are thirteen turbines theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening land form and vegetation, it is not anticipated that Burnfoot wind farm will be discernable within the view.
- 9.45 Green Knowes wind farm is located approximately 18.8 kilometres to the south of the view and eighteen turbines are theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening land form, infrastructure and vegetation, it is not anticipated that Green Knowes wind farm will be discernable within the view.
- 9.46 Lochelbank wind farm is located approximately 19.9 kilometres south east of the view and there is twelve turbine tips and eight hubs theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening infrastructure and vegetation, it is not anticipated that Lochelbank wind farm will be discernable within the view.
- 9.47 Due to the lack of visibility of other wind farms the addition of the Drummick turbine (c. 588m) to the baseline would result in a **no cumulative effect** at this viewpoint.

Viewpoint 9 – View looking south west from residential properties at Drummick

- 9.48 The Cumulative Wireframes 1a - 1d indicate that the following baseline and consented wind farms would be potentially visible at this position.

Windfarm	Approximate Distance	Direction
Drummick (proposed)	521m	W
Burnfoot Hill (operational)	24km	S
Green Knowes (operational)	19.5km	S
Lochelbank (operational)	20.4km	SE

- 9.49 Burnfoot Hill and Green Knowes wind farms are located approximately 24 kilometres and 19.5 kilometres south of the view and there are eighteen and thirteen turbines respectively theoretically visible within the wireframe. From this Burnfoot Hill wind

farm appears against the backdrop of hills and sits below the horizon line. At a distance of 24km the wind farm appears as minor element in the overall view and therefore not clearly perceivable. Green Knowes wind farm is visible above the horizon line and eighteen turbines are theoretically visible. In reality due to intervening vegetation seven turbines are screened from the view. The turbines that are visible form minor elements in the panoramic view and due to the separating distance are barely perceivable.

9.50 Lochelbank wind farm is located approximately 20.4 kilometres south east of the view and there is twelve turbine tips and nine hubs theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening infrastructure and vegetation, it is not anticipated that Lochelbank wind farm will be discernable within the view.

9.51 The addition of the Drummick turbine (c. 521m) to the baseline would result in a **minor cumulative effect** at this viewpoint.

Viewpoint 10 – View looking south east from the B8063

9.52 There would be no other wind farm developments visible within the view. Therefore there would be **no cumulative effects** to the baseline as a result of the proposed development

Viewpoint 11 – View looking south east from residential properties at Harrietfield

9.53 The Cumulative Wireframes 1a - 1d indicate that the following baseline and consented wind farms would be potentially visible at this position.

Windfarm	Approximate Distance	Direction
Drummick (proposed)	4.1km	W
Burnfoot Hill (operational)	27.1km	S
Green Knowes (operational)	22km	S
Lochelbank (operational)	20.4km	SE

9.54 Burnfoot Hill wind farm is located approximately 27.1 kilometres south of the view and there are twelve turbine tips and four hubs theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is

viewed and the screening effects of intervening land form and vegetation, it is not anticipated that Burnfoot wind farm will be discernable within the view.

9.55 Green Knowes wind farm is located approximately 22 kilometres to the south of the view and fifteen turbine tips and eleven hubs are theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening land form, infrastructure and vegetation, it is not anticipated that Green Knowes wind farm will be discernable within the view.

9.56 Lochelbank wind farm is located approximately 20.4 kilometres south east of the view and there are eleven turbine tips and four hubs theoretically visible within the wireframe. In reality, due to the distance over which the additional wind farm is viewed and the screening effects of intervening infrastructure and vegetation, it is not anticipated that Lochelbank wind farm will be discernable within the view.

9.57 Due to the lack of visibility of other wind farms the addition of the Drummick turbine (c. 4km) to the baseline would result in a **no cumulative effect** at this viewpoint.

Viewpoint 12 – View looking north west from Roman Road at the A9

9.58 The Cumulative Wireframes 1a - 1d indicate that the following baseline and consented wind farms would be potentially visible at this position.

Windfarm	Approximate Distance	Direction
Drummick (proposed)	11km	NW
Griffin Forest (construction)	23.7km	NW
Stewart Tower (construction)	15.3km	NE
Lochelbank (operational)	9.6km	SE

9.59 Griffin Forest Wind farm is located approximately 23.7 kilometres north west of the viewpoint and eight turbine tips are theoretically visible within the wireframe. These will be seen as minor elements within the panoramic view, and are so distant as to be barely perceivable. Stewart Tower turbine is located at 15.3km and is theoretically visible however intervening vegetation will screen views from this viewpoint. The

addition of the Drummick turbine (c. 11km) to the baseline would result in a **minor cumulative effect** at this viewpoint.

Summary

- 9.60 In summary, there is the potential for six other wind farm developments to be visible in the representative viewpoints. For 11 of the viewpoints the additionality of the Drummick wind turbine is not anticipated to give rise to any cumulative visual effects.
- 9.61 From six of the viewpoints (11, 10, 8, 7, 6 and 5), the addition of the Drummick turbine (c. 15km) to the baseline, was considered to give rise to a negligible cumulative effect.
- 9.62 From five viewpoints (12, 9, 4, 2 and 1), the addition of the Drummick turbine (c. 15km) to the baseline was considered to give rise to a minor cumulative effect.
- 9.63 From one viewpoint (3), the addition of the Drummick turbine (c. 15km) to the baseline was considered to give rise to a moderate/minor cumulative effect. The effects from this location are reduced due to distance to other cumulative wind farms and intervening landform and vegetation providing screening.
- 9.64 It may be possible to view the additional cumulative wind farms from other locations around the study area. However any views afforded are anticipated to be glimpsed and largely screened by intervening landform, built form, and/or vegetation. Therefore when combined with the distance between the developments, it is not considered that there will be a significant cumulative effect on the visual amenity.

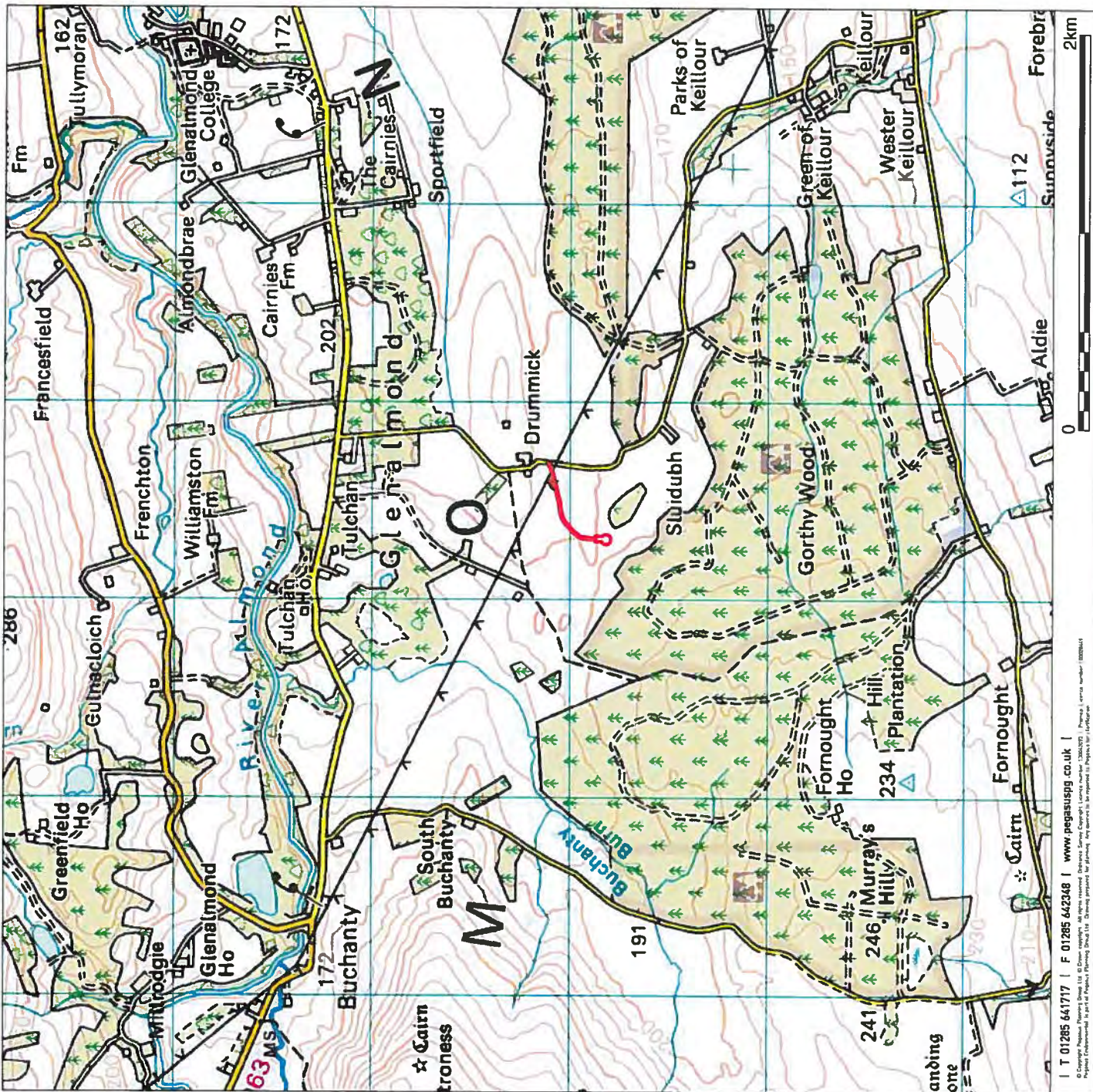
10. CONCLUSIONS

- 10.1 The landscape and visual effects have been assessed for the proposed wind turbine within the landownership at Drummick (refer to Appendix A – Site Layout and Location Plan). The proposed turbine is located within fields currently used for grazing and is not subject to any statutory or non-statutory environmental designations.
- 10.2 The proposed wind turbine is in support of national, regional, and local planning policy with regards to renewable energy, the need to protect landscape character, visual amenity, nature conservation and biodiversity. In particular, the proposals are in accordance with the objectives of National Planning policy. The development would also be in keeping with policies within regional and local plans.
- 10.3 The proposed wind turbine would not be obviously visible from key environmental designations, including the Loch Lomond and the Trossachs National Park, River Tay (Dunkeld) and River Earn (Comrie to St Fillans), or the Fowlis Wester Conservation Area (CAs)
- 10.4 The siting, scale and form of the wind turbine would introduce a further built element into the receiving landscape, although these would be generally viewed in the context of other infrastructure and transport corridors, including the pylons and transmission lines on the site itself, Perth, and the A85.
- 10.5 There would be no significant change to the physical characteristics of the surrounding area as identified within the landscape character assessments. Specifically, tree cover, field pattern, and drainage patterns would be materially unaltered by the development. As such the proposals would be in accordance with the findings of the 'Landscape Study Windfarm development in the Ochil Hills and Southern Highland Perthshire' that confirms the Lowland Hills landscape is capable of accommodating "*sensitive wind windfarms*".
- 10.6 It is evident from the Zone of Theoretical Visibility (ZTV) and field survey that actual visual envelope for the proposed wind turbine would be limited with visual effects restricted beyond 2km from the wind turbine. This would be due to the topography of area, tree cover, and distance.

- 10.7 At close proximity within 2km of the wind turbine, views of the rotor blades and tower would be evident near Sluidubh and Drummick (Photoview 8 and 9) to the south east and north west respectively.
- 10.8 Within more distant photoviews beyond 2km from the wind turbine, the tower and rotor blades generally form a small component of the view that would be assimilated into the wider landscape setting. The wind turbine would be scarcely perceptible from distant elevated locations to the south east including Dunning (Photoview 4) and Tullibardine Collegiate Church (Photoview 6). The outlying terrain of Mounth Highlands also provides an elevated backdrop behind the wind turbine, the result is that moving rotor blades would not be apparent on the skyline.
- 10.9 Although there would be visual change at close proximity it would not necessarily be a harmful one, merely slightly different to one that exists at present. It is also recognised that the proposed wind turbine would generally be viewed in the context of nearby pylons and transmission lines that already provides a strong vertical and horizontal built elements in the landscape. It is also acknowledged that any scheme involving renewable energy and wind turbines will form visible elements in the view.
- 10.10 The cumulative effect on both landscape and visual amenity arising from the proposed wind turbine and other wind farm developments would be minor.
- 10.11 The report demonstrates that the proposed wind turbine could be successfully accommodated and assimilated into the wider landscape without causing significant harm to landscape character, visual amenity or the landscape features of the area. The proposed wind turbine would be acceptable in landscape and visual terms.

APPENDIX A

Site Location Layout and Plan



KEY

Application Site Boundary

Drumstick, Glenalmond

Site Location Plan

CLEARWINDS

Drawn by : AD

Checked by : DB

Date : 03.11.11

C.0362_12-A

1 : 20,000 @ A3

Pegasus
Environmental

APPENDIX B

Detailed Assessment Methodology

The LVIA has been undertaken in accordance with best practice, as outlined in the following published guidance:

- Guidelines for Landscape and Visual Impact Assessment (2nd edition) - Landscape Institute/ Institute of Environmental Management and Assessment (2002)
- Landscape Character Assessment Guidance for England and Scotland - (2002) Countryside Agency / Scottish Natural Heritage
- The Guidelines for Environmental Impact Assessment - (2004) Institute for Environmental Management and Assessment

In accordance with published guidance, landscape (elements and character) and visual impacts are assessed separately, although the procedure for assessing each is closely linked. A clear distinction has been drawn between landscape and visual impacts as described below:

- Landscape impacts relate to the effects of the proposal on the physical and other characteristics of the landscape and its resulting character and quality.
- Visual impacts relate to the effects on views experienced by visual receptors (e.g. residents, footpath users, tourists etc.) and on the visual amenity experienced by those people.

The LVIA assesses both the long term effects relating to the operational lifetime of the proposed development and also the short term effects associated with its construction.

The study area for the LVIA was taken to be a 25 kilometres radius from the site as it is considered that beyond this distance, even with good visibility, the proposed development would not be perceptible in the composite landscape.

The proposed scheme was assessed for the purposes of the landscape and visual analysis.

Landscape Elements and Character Assessment Methodology

A baseline landscape assessment was carried out to determine the current elements and character of the landscape within and surrounding the site. This involved an initial desktop study of:

- Ordnance survey maps at 1:50,000, 1:25,000 scales
- Aerial photographs of the site and surrounding area

- Relevant planning policy
- National and local scale landscape character assessments

Following the desk top study field and photographic surveys were undertaken in December 2011.

Visual Assessment Methodology

In the first instance a digital terrain model with a radius of 25 kilometres (as agreed with the local planning authority) was constructed to illustrate the nature of the topography as it relates to the estimated theoretical zone of visual influence. The proposed wind turbine was superimposed upon this framework at the location of the site to determine the Zone of Theoretical Visibility (ZTV) associated with the proposed structure to upper (highest) edge of panel.

The assessment of visual effects was undertaken on the basis of viewpoint analysis as recommended in best practice guidelines. The viewpoints which are in different directions from the site and are at varying distances and locations were selected to represent a range of views and visual receptor types.

The viewpoints are representational and not exhaustive. They are taken from publically accessible land and not from any third party, private, land.

The viewpoints were used as the basis for determining the effects of visual receptors within the entire study area. The viewpoints were photographed at 1.7 metres above ground level.

Assessment Criteria

In accordance with the Landscape and Visual Impact Assessment Guidelines, 2nd edition (2002) the significance of effects is ascertained by cross referencing the sensitivity of the baseline landscape or visual receptor and the magnitude of change as a result of the development.

Sensitivity of landscape elements

The sensitivity of an individual landscape element reflects factors such as its quality, value, contribution to landscape character and the degree to which the particular element can be replaced. A particular element or feature may be more sensitive in one location than in another. It is therefore not possible to simply place different elements into sensitivity bands. Professional judgement has been used to determine the magnitude of direct physical impacts on individual existing landscape elements as follows:

Table 1 Criteria for magnitude of change for landscape elements

Negligible	No loss or very minor alteration to part of an existing landscape element
Low	Minor loss or alteration to part of an existing landscape element
Medium	Some loss or alteration to part of an existing landscape element
High	Total or major loss of an existing landscape element

Table 2 Levels of sensitivity for landscape elements

Low	Landscape elements in below average or poor condition e.g. C or R grade trees (BS 5837)
Medium	Landscape elements in good condition but with no statutory protection e.g. A and B grade trees (BS 5837)
High	Landscape elements with statutory protection e.g. Tree Preservation Order

Sensitivity of Landscape Character

The sensitivity of landscape character is an expression of a landscapes capacity to accommodate change. It varies depending on factors such as the scale and form of the landscape, landscape pattern, sense of enclosure, sense of tranquillity and remoteness, the settlement pattern and transport network etc. The sensitivity of landscape character is described as high, medium or low and the judgement about how sensitive the character areas are has been made by extrapolating this information from the relevant regional and local landscape character studies. Professional judgement has been used to determine the magnitude change on landscape character as follows:

Table 3 Criteria for magnitude of change for landscape character

Negligible	No notable introduction of new elements into the landscape or
-------------------	---

	change to the scale, landform, land cover or pattern of landscape
Low	Introduction of minor new elements into the landscape or some minor change to the scale, landform, land cover or pattern of landscape
Medium	Introduction of some notable elements into the landscape or some notable change to the scale, landform, land cover or pattern of landscape
High	Introduction of major elements into the landscape or some major change to the scale, landform, land cover or pattern of landscape

Table 4 Levels of sensitivity for landscape character

Low	Areas that exhibit a negative character. May have a strong sense of enclosure that reduces visual sensitivity, are likely to be already affected by man-made elements, have reduced tranquillity, are likely to have little inter-visibility with adjacent landscapes and exhibit a low density of sensitive landscape elements. Includes detractors such as power-lines, industrial derelict or inappropriate built forms with no aesthetic value or evidence of strategic planning. There is a lack of mature vegetation cover and no landscape designations apply
Medium	Areas that exhibit a positive character. May have some sense of enclosure, or be affected by some man-made elements, or have little inter-visibility with adjacent landscapes and exhibit a moderate density of sensitive landscape elements. There is a reasonable distribution of semi-natural vegetation, trees and shrub cover and the overall view of the area is pleasant. Local landscape designations of cultural and historic value may be present.
High	Areas that exhibit a strong positive, character. May be open or exposed with a remote character and an absence of man-made elements. They are often highly visible from adjacent landscapes and exhibit a high density of sensitive landscape elements. Includes the most aesthetically attractive landscapes e.g. nationally designated areas such as National Parks, AONB.

Sensitivity of Visual Receptors

Representative viewpoints have been used in the assessment to represent different visual receptor groups at various distances and directions from the site. In general it is recognised

that residential receptors, recreational users of public rights of way or people at recognised vantage points have a higher sensitivity to change than people travelling along roads or conducting their daily business e.g. at their place of work.

Table 5 Criteria for magnitude of change for visual receptors

Negligible	No notable change in the view
Low	Some change in the view that is not prominent / few visual receptors affected
Medium	Some change in the view that is clearly visible and forms an important but not defining element in the view
High	Major change in the view that has a defining influence on the overall view / many visual receptors affected.

Table 6 Levels of sensitivity for visual receptors

Low	Includes people at place of work e.g. industrial and commercial premises
Medium	Includes people engaged in outdoor sporting facilities and people travelling through the landscape on roads and trains
High	Includes occupiers of residential properties and users of public rights of way and POS

Impact Significance

The significance of the landscape and visual effects is determined by cross referencing the sensitivity of the landscape element, landscape character or view with the magnitude of change. The significance of effects is described as substantial, moderate or slight. Those effects identified as being of substantial, and substantial/moderate significance may be regarded as significant when discussed in terms of the EIA Regulations.

Table 7 Degree of significance thresholds for landscape character, landscape elements and visual receptors

		Magnitude of Change			
		High	Medium	Low	Negligible/None
Landscape and Visual Sensitivity	High	Major	Major/ Moderate	Moderate/ Minor	Minor/Moderate
	Medium	Major/Moderate	Moderate	Minor/ Moderate	Minor
	Low	Moderate/ Minor	Minor/ Moderate	Minor	Negligible/None
			Significant		
			Potentially Significant		
			Not Significant		

Nature of Effects

Guidance provided by the Landscape Institute on the Nature of Effect, in its publication 'Guidelines for Landscape and Visual Impact Assessment', is limited to a single entry that states that effects can be negative (adverse) or positive (beneficial). The guidance, however, does not determine how this should be implemented in practice. The nature of effect is therefore one that requires subjective interpretation and, where applied, involves reasoned professional opinion.

In relation to many forms of development, the LVIA will identify 'positive' and 'negative' effects by assessing these under the term 'Nature of Effect'. The landscape and visual effects of wind farms are difficult to categorise in either of these as, unlike other disciplines, there is no definitive criteria by which the effects of wind farms can be measured as being categorically 'positive' or 'negative'.

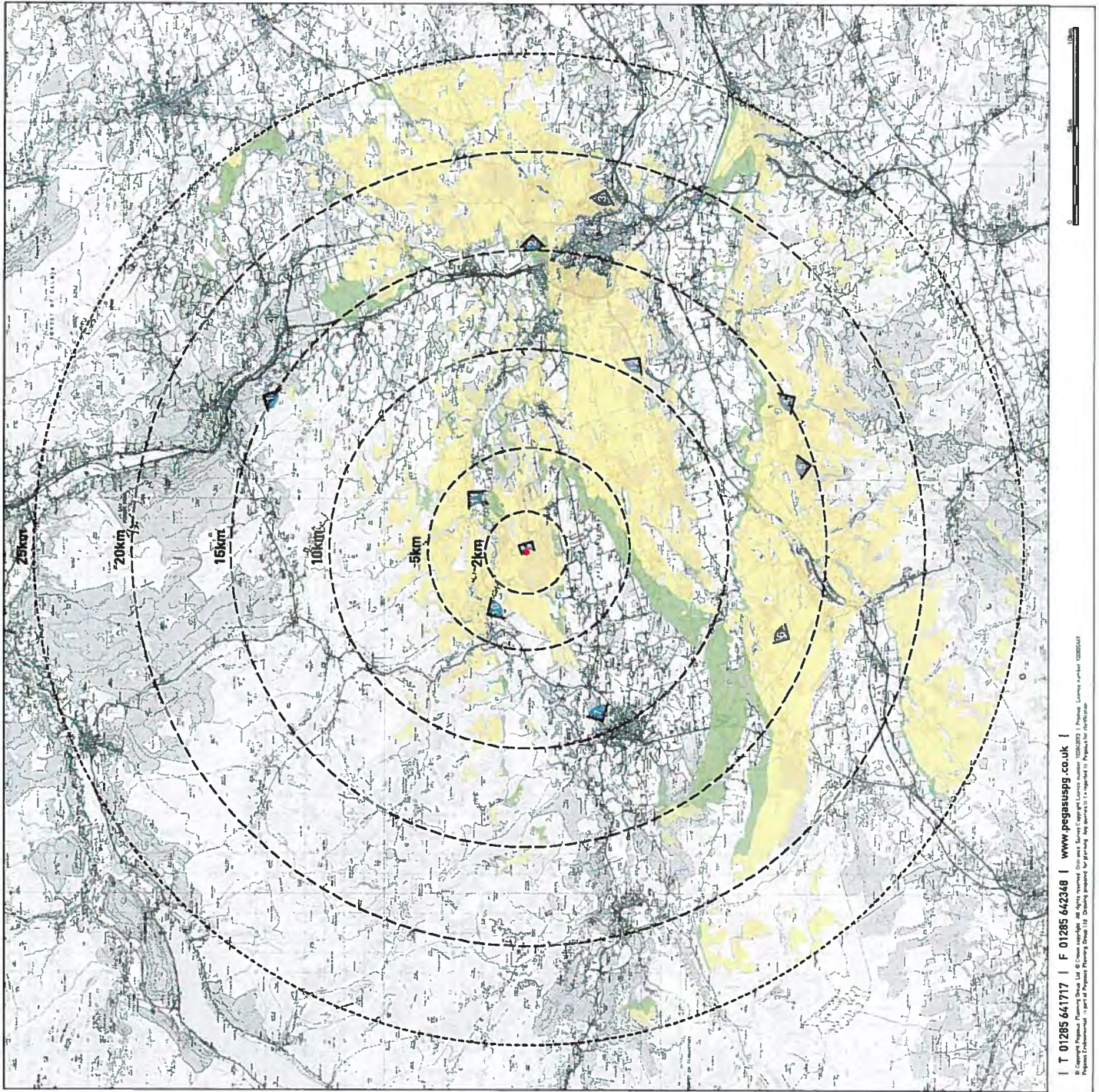
In some disciplines, such as Noise or Ecology, it is possible to quantify the effect of a wind farm in numeric terms, by objectively identifying/ quantifying the proportion of a receptor that is affected by the development, and assessing the nature of that effect in justifiable terms. However, this is not the case in relation to landscape and visual effects where a subjective based approach is inevitably needed.

The nature of the effect, insofar as positive and negative effects are concerned, is a term

that is used inconsistently by Landscape Professionals when preparing landscape and visual assessments for wind farms, as evidenced in many appeal documents on this topic, and there is not a consensus of opinion that supports its use for wind farm assessments. The magnitude of change takes account of such considerations as scale comparisons and the appearance of the wind farm in relation to its setting, which can be important to the assessment of significance. In this way positive and negative aspects of the effect are incorporated into the assessment of significance, but not individually expressed as positive or negative.

APPENDIX C

Zone of Theoretical Visibility (ZTV) to Wind Turbines Blade Tips and Photoview Locations



KEY

Location of Proposed Turbine



Viewpoint Locations

Zone of Theoretical Visibility:



Hub & Tip Visible - Hub Height 50m

Tip Visible - Tip Height 77m

T1 - 295306, 724818

ZTV Production Information -
- DTM data used in calculations is Landform Panorama 50m
- Calculations based on a bare earth survey
- Viewer height set at 1.7m
- Calculations include earth curvature and light refraction

N.B. The Zone of Theoretical Visibility (ZTV) image illustrates the theoretical extent of where turbines will be visible from, assuming 100% visibility. It is generated using terrain data only and does not take into account any potential screening by the built environment may provide. It is, as such, 'a worst case' ZTV and the actual extents of visibility are likely to be much less extensive.

Drumstick, Glenalmond

Zones of Theoretical Visibility
with Viewpoint Locations

CLEARWINDS

Drawn by : JS

Checked by : RC

Date : 04.11.11

C.0362_15-A

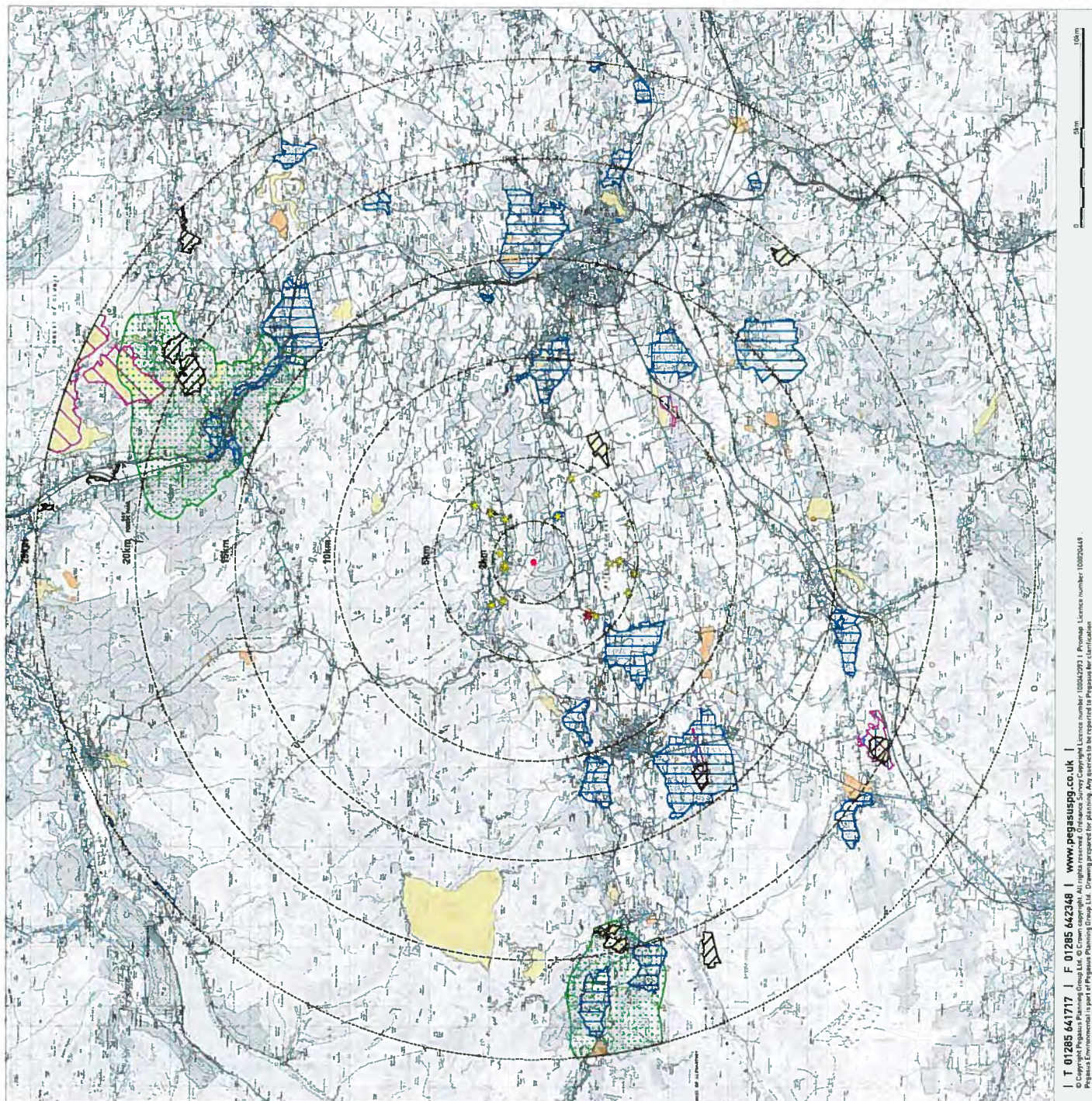
1 : 200,000 @ A3



Pegasus
Environmental

APPENDIX D

Environmental Designations



KEY

- Location of Proposed Turbine
- Historic Gardens & Designed Landscapes
- National Scenic Area
- National Park
- RAMSAR
- Scheduled Monument
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation
- Special Protection Area
- Listed Building (within 5km)
- Conservation Area (within 5km)

Drummick, Glenalmond

Environmental Designations

CLEARWINDS

Drawn by : AD

Checked by : RC

Date : 17.06.2011

C.0362_09-A

1 : 100,000 @ A1



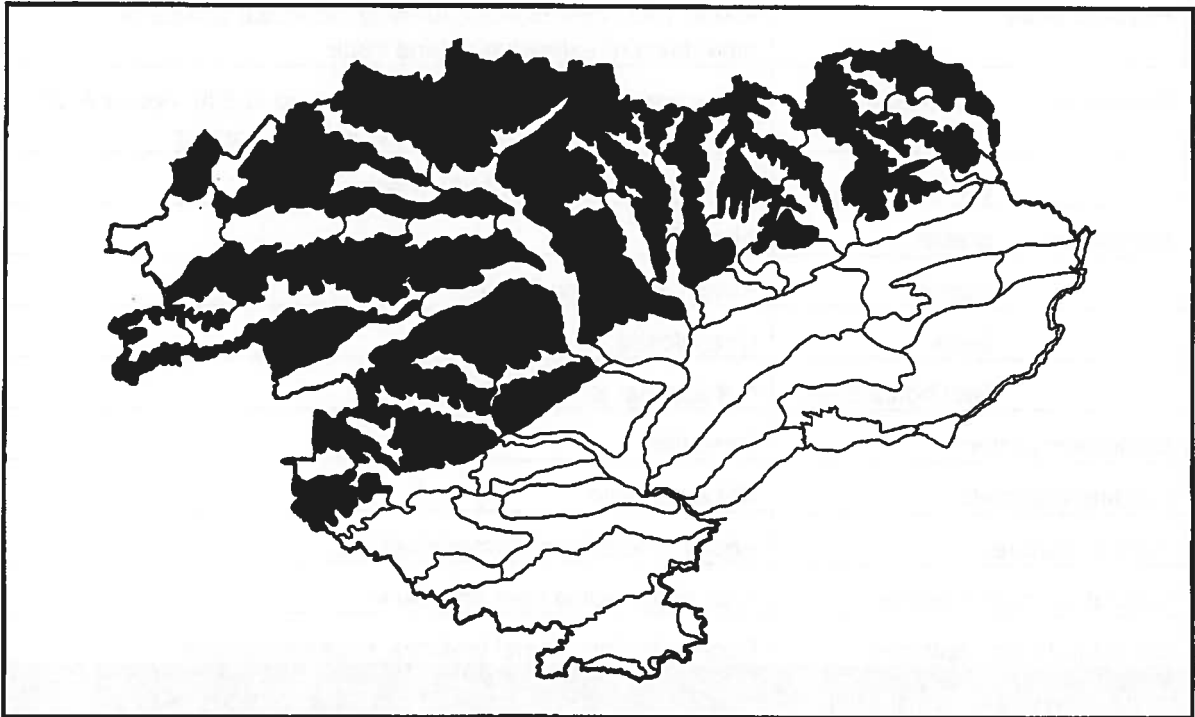
Pegasus
Environmental

APPENDIX E

National Character Area and

Local Landscape Character Area Extracts

HIGHLAND SUMMITS AND PLATEAUX (3)



KEY CHARACTERISTICS

- *areas of upland separating the principal glens*
- *West Highlands comprise distinct summits and ranges, separated by fault line lochs; the hills are sharply defined and often craggy*
- *Mounth Highlands comprise a more extensive area of upland with spurs extending southwards; the hills are more rounded than those to the west and rock outcrops are fewer*
- *vegetation patterns closely reflect altitude and exposure and include heather, grassland, blanket bog and arctic alpine plant communities; variations reflecting the underlying geology*
- *most of the area managed as open moorland*
- *little or no settlement*
- *some extensive plantations*
- *one of the remotest and wildest landscapes in the UK*

OBJECTIVE DESCRIPTION		Highland Summits and Plateaux
Physical scale		400 to 1000 metres AOD, forming individual groups of mountains or extensive upland tracts
Woodland	broad-leaf	A few areas of semi-natural woodland up to 600 metres AOD. Generally cleared by burning, cutting and grazing
	coniferous	Plantations up to about 450 metres
Agriculture	arable	Absent
	pasture	Rough and unimproved
	fields	Unenclosed
	field boundaries	Not applicable
Settlement pattern		Unsettled
Building materials		Not applicable
Historic features		Ancient routeways, former shielings
Natural heritage features		Rich arctic-alpine flora and fauna
Other landscape features		Rock outcrops, glacial features, expansive views
SUBJECTIVE DESCRIPTION		
Views		Panoramic
Scale		Large
Enclosure		Exposed
Variety		Simple to uniform
Texture		Rough
Colour		Muted
Movement		Distant
Unity		Unified
'Naturalness'		Undisturbed to managed

LOCATION

- 5.3.1 This landscape type comprises the areas of upland separating the principal glens, to the north of the Highland Boundary Fault. As with the glens described above, a broad distinction can be drawn between the West Highlands to the west of Glen Garry/Drumochter, and the Mounth Highlands to the east. While the hills generally reach similar heights, those in the west tend to be craggier and those in the east more rounded. This reflects the higher rates of erosion in the west due to the more rapid accumulation of snow and ice during period of glaciation and the pre-glacial landform. The West Highlands are more heavily dissected than the Mounth. The latter therefore includes more extensive areas of upland plateau. Furthermore, as noted above, east-west fault lines have determined the orientation of western glens while north-south valleys in the Mounth reflect the inclination of the massif.

West Highlands

- 5.3.2 The West Highlands can therefore be described as a series of comparatively discrete hills or ranges, as follows:
- Ben Vorlich and the Forest of Glenartney, south of Loch Earn;
 - Ben Chonzie/Sròn Mhór/Meall nam Fuaran and Craigvinean Forest between Strathearn and Loch Tay/Strath Tay;
 - Ben Lawers and Beinn Heasgarnich range south of Glen Lyon;
 - Carn Gorm/Schiehallion range between Glen Lyon and Loch Rannoch;
 - Meall Tairneachan Group between Strath Tay and Loch Tummel;
 - Talla Bheith and Craiganour Forest between Lochs Rannoch and Tummel and Glen Garry.

Mounth Highlands

- 5.3.3 The Mounth Highlands form a more continuous area of upland with a series of spurs extending southwards towards Strathmore. The principal areas can be summarised as follows:
- Forest of Atholl north of Glen Garry;
 - Forest of Clunie west of Strathardle;
 - Forest of Alyth between Glen Shee and Glen Isla;
 - Caenlochan Forest/Glen Doll Forest between Glen Shee and Glen Clova;
 - Muckle Cairn/Hill of Glansie/Hill of Wirren between Glen Clova and Glen Esk;
 - Hills of Saughs/Mount Battock, north and east of Glen Esk.

- 5.3.4 The rest of this section describes the whole of the Highland Summits and Plateaux landscape character type. It draws examples from within both the West Highlands and Mounth Highlands, as appropriate, but also highlights key differences between them, where they occur.

PHYSICAL CHARACTERISTICS

- 5.3.5 The geology of these Highland areas has already been described in relation to the intervening glens. Dalradian and Moinian grits and schists dominate, forming broad bands running south-west to north-east, parallel to the Highland Boundary Fault. These rocks were once the sediments of limestones, sandstones and shales, metamorphosed by heat and pressure to form huge schist mountains which, over millions of years, were reduced to the mountains we see today. The area also has significant intrusions of other rock forming parallel bands. These rocks include granites, limestones, quartzites and intrusive diorite. These differing rock types can have an important influence on local landform. Harder rocks result in outcrops, softer rocks result in eroded basins. They also influence vegetation patterns. Barytes has been quarried in parts of this area and further proposals for mineral extraction may come forward in the future.
- 5.3.6 Vegetation on the schists varies with altitude and exposure. On the moorland slopes below 600 metres, the land cover tends to be dominated by heather, mixed with sedge, rush, bog asphodel, cotton grass, and purple moor grass. On some of the shallower plateau slopes (for example on the Atholl upper moors) blanket bog has developed, with peat lying a metre or more deep. Heather is particularly extensive on drier moorland slopes, such as those in Glen Clova, turning the hillsides purple and pink in late August and September. Grass tends to dominate in the western part of the Highlands. At between 600 and 900 metres there is a pronounced transition from heather and grass moorland to the arctic alpine zone with many screes, rock outcrops and, where topography and soil accumulation allows, a low growth of blaeberry and crowberry, and sometimes a mat of prostrate heather. Otherwise, it is lichens which predominate in this exposed, often inhospitable environment. Periglacial features produced by freeze-thaw processes, are also evident in the higher areas.
- 5.3.7 Vegetation patterns vary with the underlying rock, however. Perhaps the most common of these variations occurs where calcareous schists and limestone rocks occur. Particular plant communities associated with these rocks are found on Ben Lawers, Carn Gorm, Beinn A'Ghlo and Schiehallion among others. A number of these summits are protected as SSSIs, while Ben Lawers, regarded by some as one of the finest examples of arctic alpine flora, is designated as a National Nature Reserve (NNR). Caenlochan is also a NNR.
- 5.3.8 Most of the vegetation of the Highlands is managed for grouse, deer and sheep. Tree and scrub growth is prevented by burning, grazing and tree-cutting. Although there are a few patches of semi-natural woodland on slopes up to about 600 metres, the tree roots and stumps that are sometimes visible in areas of bog point to the former extent of woodland on these moors. In other countries, where similar sub-arctic conditions occur, land uses have allowed the growth of vegetation such as dwarf birch and willow, forming a transition from lower habitats to the ground vegetation of the arctic-alpine zone.

- 5.3.9 The Highland areas support a variety of habitats. Notable species of birds found in the area include ptarmigan, dotterel, dunlin and golden plover on the higher ground and peregrine falcon, red and black grouse, snipe, curlew, hen harrier, siskin, lesser redpoll and capercaillie on the lower moors and in the remaining areas of woodland. Red squirrel, mountain hare and wild cat are not uncommon, while much of the area is inhabited by both red deer and roe deer.

SETTLEMENT AND LAND USE

- 5.3.10 Human activity is specialised in the upland areas. Long managed by the large estates for hunting and shooting (hence the term 'forest' which is used extensively throughout the area), the upland areas also once provided areas of summer grazing when transhumance (the seasonal movement of sheep and cattle between the lowland and upland pastures) was a common practice. The remains of the old shielings, often sited in the most sheltered parts of the upland, can still be found today, for example on the southern and eastern slopes of Ben Lawers above Loch Tay. Historically, there would also have been many tracks and paths through the uplands, providing links with areas to the north or west. Many of these were important droving routes, used when moving stock to and from market. Some of the best examples of these old routes are found at the head of the 'cul-de-sac' glens of the Mounth. Jock's Road, for example climbs out of Glen Doll, crossing a bealach south of the White Mounth before dropping down towards Braemar. Few modern roads follow these old routes, one of the exceptions being the A93 through Glen Shee which crosses the Mounth at Cairnwell. While these historic tracks, together with more recent stalkers' paths and footpaths, are an important recreational resource, the creation of additional tracks and paths could have a local landscape impact and could undermine the special character of these areas.
- 5.3.11 Other signs of human activity are generally limited to the patterns created by heather burning, and the comparatively small number of upland conifer plantations. Large coniferous woodlands on the upland plateaux (for example above Glen Garry) are less intrusive than within the glens or where the scale of the landscape is less expansive. Here they appear as a thin layer which does not upset the scale or drama of the highlands. The hills are largely free from tall structures with the exception of pylons serving hydroelectric schemes, particularly in the West Highlands. Depending upon the angle of view, the season and the light, these pylons can appear as light grey structures against an otherwise sombre landscape of browns and greens.
- 5.3.12 In summary, therefore, despite active management which favours heather moorland over other forms of sub-arctic vegetation, the Highland Summits and Plateaux comprise one of the wildest landscapes in the UK. Dramatic mountains, sweeping moorlands, extensive views throughout southern Scotland and constant exposure to changing, often extreme weather conditions, all shape perceptions of the landscape. Hidden from view are the more sheltered, fertile and settled glens. Remoteness is another important factor. With just a few roads climbing out of the glens onto the high moorland, these are relatively inaccessible areas requiring commitment on the part of those visiting them.

FORCES FOR CHANGE

- 5.3.13 This section contains a description of the principal types of change that have affected this landscape type in the recent past or which are likely to affect it in the future. Changes may be positive or negative in terms of their effect on the landscape. The aim of this section is to gain a clear understanding of the nature and direction of change and its likely impact on the essential character and quality of the landscape. This analysis provides the basis for management guidelines to assist other organisations develop more detailed policies for agriculture, forestry and development.
- 5.3.14 **Transport.** For the most part, the highland summits and plateaux are inaccessible, served only by rough tracks or stalkers' paths. The highland massifs are comparatively dissected so many roads follow lowland routes. There are comparatively few highland passes, and these are generally minor in their impact on the upland landscape.
- 5.3.15 **Forestry and woodland.** The highland summits and plateaux contain relatively little commercial forestry. Notable exceptions include Craigvean Forest between Aberfeldy and Pitlochry and areas around Glen Isla.
- 5.3.16 The wider landscape impact of these woods is comparatively limited. In part this is because of the high ratio of open moorland to plantation. It also reflects the grand scale of the landscape, and the appearance of the woods as little more than dark shapes on an already sombre landform. This perception could change if the scale of woodland increased significantly so as to replace the mottled appearance of the heather moorland with more uniform areas of conifers. It is unlikely that such proposals will come forward since the regional Indicative Forestry Strategy describes much of the area as being 'unsuitable for tree crops'.
- 5.3.17 Much of the Highland Summits and Plateaux are managed for deer and grouse, preventing the natural regeneration of woodland where this could occur. To that extent, the upland landscape that we see today is highly managed and closely allied to the historic pattern of estate management and economy. Appropriate grazing management, supported by appropriate funding mechanisms, could help develop opportunities for natural regeneration of dwarf and other woodland on the lower and mid slopes.
- 5.3.18 **Recreation.** The management of the Highland Summit and Plateau landscape for game has been noted above. With the exception of this, recreation pressures are relatively few on this remote, harsh landscape type. The principal exceptions are the more popular peaks such as Ben Lawers, Schiehallion and Ben Vorlich where substantial numbers of walkers and climbers can cause local problems of erosion. The creation of new paths and tracks in this mountain environment should be avoided. There may be additional pressures for ski development, particularly at the head of Glen Beag where there are proposals to expand the existing facilities southwards. This would extend the zone of visual influence associated with the ski area. Elsewhere, there may be pressure to expand cross-country skiing, with the provision of cross-country routes in areas such as Ben Lawers.

- 5.3.19 **Tall structures.** The Highland Summits and Plateaux are comparatively free from tall structures such as pylons and masts. There are, however, a number of electricity pylons lines which link hydroelectric plants and which climb out of the highland glens to cross the exposed upland. Examples include the pylons between Tummel Bridge and Glen Garry, and the pylons between Appin of Dull and Glen Quaich. Though the lines of pylons are relatively small when set within the expansive uplands, they are a modern and functional intrusion into the highland landscape. Opportunities to bury these cables should be taken should they arise. Additional pylons should be resisted.

LANDSCAPE GUIDELINES

- 5.3.20 The following guidelines reflect the sensitivities of the landscape and the pressures for change acting upon it. They are intended to provide a broad basis for the development of more detailed management strategies. The overall aim of such strategies should be to conserve the characteristic upland landscape of open, unsettled moorland vegetation and to maintain the contrast with the more settled and wooded glens and lowlands.

Transport	<ul style="list-style-type: none"> • Minimise upgrading or improvement of roads particularly where this involves the creation of cuttings and embankments, or the introduction of additional signage, or features such as concrete kerbing.
Development	<ul style="list-style-type: none"> • Discourage any development on the Highland Summits and Plateaux.
Forestry and woodland	<ul style="list-style-type: none"> • Ensure any new woodland proposals comply with the agreed standards of good forest design. • Encourage the removal of small, geometric plantations, allowing equal increases in planting in more appropriate locations elsewhere. • With respect to the replanting of existing plantations: <ul style="list-style-type: none"> - encourage the rationalisation of woodland to avoid isolated, small to medium sized areas of plantation woodland which appear prominent in an otherwise open landscape; - adopt a more naturalistic appearance, responding to the landform and features such as burns, gullies and crags; - create graded and irregular margins at the top and bottom of the slope, allowing views of upper slopes from within the glen; - discourage straight lateral edges - do not plant up to the edge of a land holding where this creates a strong and geometric vertical line; - employ more varied species mixes; - vary the size of felling coupes, with smaller areas on lower slopes.

(Forestry and woodland contd.)	<ul style="list-style-type: none"> • Explore opportunities to modify management practices to allow the regeneration of native upland treecover in some areas.
Recreation	<ul style="list-style-type: none"> • Maintain low-key level of provision. • Avoid creation of new mountain tracks and paths. • Expansion of ski facilities into this landscape type should only be permitted if it is clear that: <ul style="list-style-type: none"> - the visual and landscape impact is limited; - there is no scope to accommodate expansion to the north; - the economic need for the scheme is demonstrated. • Indirect effects including traffic and the proliferation of related facilities (ski hire shops) should also be taken into account.
Tall structures	<ul style="list-style-type: none"> • Discourage proposals for aereals, masts or wind turbines or additional pylons because of their likely impact on the harsh, undeveloped character of the Highland Summits and Plateaux. • Ensure that any proposals are subject to rigorous landscape impact assessment. • Where new power or telephone lines are proposed or required, ensure that operators adopt underground cable solutions.

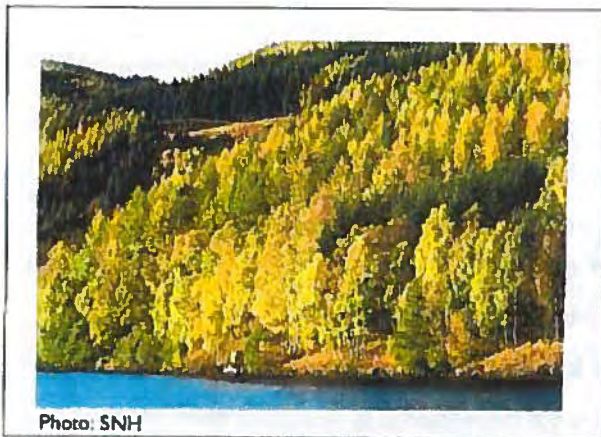


Photo: SNH

LOWER HIGHLAND GLENS WITH LOCHS

Loch Tummel - a richly wooded landscape enclosing the enlarged loch; settled and modified by designed landscapes.



Photo: SNH

HIGHLAND SUMMITS AND PLATEAUX

Exposed, craggy uplands along Glen Lyon, punctuated by surviving Scots pines.



Photo: SNH

PLATEAU MOOR

Lochans, blanket bog, granite boulders and grey tree stumps characterise the desolate landscape of Rannoch Moor



HIGHLAND FOOTHILLS

A complex landscape of interlocking, ridge-like hills and intervening valleys - here close to White Caterthun Fort.



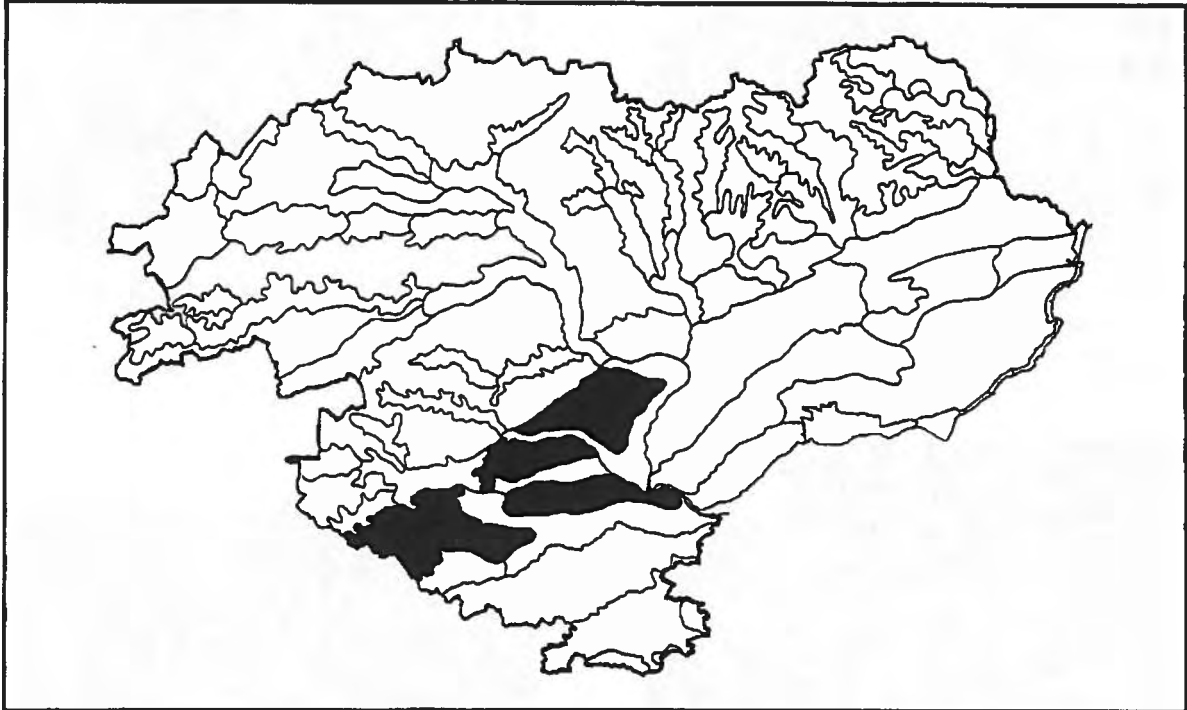
LOWLAND HILLS

The rounded upland character of the hills south of Comrie.

FIGURE 14

LANDSCAPE CHARACTER TYPES

LOWLAND HILLS (6)



KEY CHARACTERISTICS

- *low ridges and hills separating lowland straths and adjoining the nearby uplands*
- *composed of soft, red sandstones*
- *transitional character with pastures on lower slopes, giving way to rough grazing and even open moorland*
- *evidence of several phases of historic settlement*
- *extensive woodland, including forestry plantations*
- *influence of modern development*

OBJECTIVE DESCRIPTION		Lowland Hills
Physical scale		Broad ridges and rounded hills rising to between 150 and 600 metres AOD
Woodland	broad-leaf	Small farm woods and woodland along sheltered burns
	coniferous	Extensive areas of plantation
Agriculture	arable	Limited to lower slopes and some sheltered, gentler upper slopes
	pasture	Improved pasture dominant, giving way to rough grazing and moorland on upper slopes
	fields	Medium, rectilinear where landform allows
	field boundaries	Hedges on lower slopes and walls on upper slopes
Settlement pattern		Sparse scatter of farmsteads. Also masts, roads
Building materials		Sandstone and harder schists and granites
Historic features		Prehistoric, Roman, medieval and later influences
Natural heritage features		Moorland areas
Other landscape features		No notable features
SUBJECTIVE DESCRIPTION		
Views		Panoramic/framed
Scale		Medium
Enclosure		Open to semi-enclosed
Variety		Varied to simple
Texture		Textured to rough
Colour		Muted
Movement		Still
Unity		Interrupted
'Naturalness'		Tamed to restrained

LOCATION

- 5.6.1 Between Strathallan and the Strath Tay at Dunkeld lies a series of low ridges and hills, separating the lowland valleys. The principal examples include the Gask Ridge west of Perth, the Keillour Forest south of Glen Almond, the Bankfoot Hills between Glen Almond and Dunkeld, and what we have termed the Knaik Hills lying to the south of Glen Artney.

PHYSICAL CHARACTERISTICS

- 5.6.2 Unlike the Highland Foothills (described above) which have a complex geological structure, the Lowland Hills lie to the south of the Highland Boundary Fault, entirely on the broad band of Old Red Sandstone which runs south-west to north-east across the region. A series of quartz-dolerite dykes run through several of the hills, however, contributing to their greater resistance to erosion. One such dyke runs westwards from Perth along the Gask Ridge to the River Earn near Crieff.
- 5.6.3 These Lowland Hills form the transition between the Highlands to the north and west and the lowlands to the south and east. They vary in height, the highest being the Knaik Hills which rise to over 600 metres AOD, and the lowest being the Gask Ridge which rises to just 150 metres AOD. In contrast to the areas of true upland to the north, these hills are generally smooth and well-rounded. Small valleys cut easily into the sandstone creating a series of convex ridges and valleys to the north of the lower part of Glen Almond.
- 5.6.4 The transitional nature of the hills is reflected in landcover and vegetation. Pastoral and even arable fields on the lower slopes give way to rough grazing and then to open moorland as height is gained. This is particularly evident on the Knaik Hills which, because of their scale and height, have a particularly upland character. Even on the low Gask Ridge, where farmland extends onto the summit line, and the land is quite fertile, the greater exposure contributes to the transitional character. There is a considerable amount of coniferous forestry in this landscape type, though this is concentrated where less fertile glacial till occurs. Large plantations are found on the lower slopes of the Knaik Hills, along the Gask Ridge and in the Keillour Forest. Smaller plantations are found along the valleys which drain the Bankfoot Hills. In places, stands of conifers are extremely geometric. Particular examples are found east of the A822 above Crieff where narrow bands of conifers extend up the hillside from the floor of the glen, pushing over the summit and beyond.

SETTLEMENT AND LAND USE

- 5.6.5 With the exception of their most elevated parts, the landscape of these hills shows evidence of thousands of years of settlement and land use. The hills are rich in prehistoric remains including standing stones (for example on the lower slopes of Dunruchan Hill south of Comrie, and in the vicinity of Fowlis Wester in the Keillour Forest), cairns, stone circles and hut circles. Roman occupation is equally well-represented by forts (e.g. at Braco and west of Buchanty at the head of lower Glen Almond), roads (e.g. along the Gask Ridge) and signal stations. The hills' location close to several 'gateways' to the Highlands is reflected in the number of castles and fortified houses. Examples include Huntingtower, Keillour and Drummond Castles. Many of these became transformed into landscaped estates over subsequent centuries. Today,

agriculture predominates. There are, however, signs of modern development including the busy A9 corridor where it climbs over the Gask Ridge to the west of Perth, the lines of pylons which fan out from the highland glens carrying power to the lowlands, and a number of telecommunication masts (e.g. on Kirton Hill near Perth) exploiting the hills' proximity to settled lowland. Large areas of the Knaik Hills are reserved for military use.

FORCES FOR CHANGE

- 5.6.6 This section contains a description of the principal types of change that have affected this landscape type in the recent past or which are likely to affect it in the future. Changes may be positive or negative in terms of their effect on the landscape. The aim of this section is to gain a clear understanding of the nature and direction of change and its likely impact on the essential character and quality of the landscape. This analysis provides the basis for management guidelines to assist other organisations develop more detailed policies for agriculture, forestry and development.
- 5.6.7 **Agriculture.** The transitional nature of the Lowland Hills (like the Highland Foothills) is reflected in the pattern of agriculture with arable on some of the lower slopes giving way to enclosed pastures and eventually, in the case of the more exposed areas, to rough moorland grazing. As in the case of the Highland Foothills, the nature of this transition may vary according to market conditions and the level of support. In particular, it is likely that cereal production has extended uphill from the lowland straths onto parts of the lowland hills such as the Gask Ridge. This does not, however, seriously weaken the contrast between lowland, lowland hills and the highlands.
- 5.6.8 Many farms in the foothills have constructed modern agricultural buildings such as sheds and barns. These are generally of a smaller scale than those found in the lowland straths.
- 5.6.9 **Transport.** The Lowland Hills have a network of main and minor roads. These are generally small-scale and fit with the grain of the landscape. The exception is the A9 corridor which crosses the eastern part of the Gask Ridge and the Bankfoot Hills to the north of Perth. Existing coniferous woodland, together with cuttings provide a degree of screening. However there are a number of sections (particularly the length climbing onto the Gask Ridge from Strathearn) which have a much wider landscape impact.
- 5.6.10 **Development.** Development within the Lowland Hills is very limited, generally comprising little more than a scatter of farmsteads and a few small hamlets. Small, stone settlements such as Fowlis Wester and Findo Gask characterise the lower parts of this landscape type. Along the A9 corridor, particularly to the north of Perth, there has been some more recent residential settlement, in particular expanding villages such as Bankfoot. In others, such as Methven for example, land has been allocated for further housing development. There is scope to accommodate further development in the dissected lower parts of the Bankfoot Hills without major impacts on the wider landscape. The Perth Area Local Plan (Perth and Kinross District Council, 1996) indicates that the possibility of establishing a new village in the vicinity of Moneydie is the subject of early discussions between interested parties. The impact of housing developments in these Lowland Hill areas would have as much to with their layout, scale, variety, materials and vernacular, as with their location within the landscape. Housing developers should be encouraged to adopt layouts and designs which integrate new dwellings into existing

settlements, rather than simply grafting suburban estates onto the edge of villages and hamlets. There may also be some scope for sensitive residential conversions where traditional farm buildings have become redundant.

- 5.6.11 **Forestry and woodland.** The elevation, soils and prevailing climate of the Lowland Hills makes them well-suited to commercial forestry. This is reflected in the Tayside Indicative Forestry Strategy which categorises much of this landscape type as being 'preferred' or 'potential' areas for new planting. The area already includes a considerable number of coniferous plantations, particularly along the low ridges between Glen Almond and Strathearn. Taking a regional perspective it is evident that the Lowland Hills, like the Highland Foothills, are relatively free from the constraints associated with the most productive agricultural land and the sensitive Highland areas. At a more local level, there is obviously a concern that any additional planting should not be such as to change significantly the landscape character of the hills. Some areas already have about 50% planting, while others (particularly the Knaik Hills and the western part of the Bankfoot Hills) have an open, upland character that could be affected by new planting. Key factors to be considered include:
- scale of new planting relative to the landform and the proportion of unplanted land;
 - species composition;
 - relationship with existing semi-natural or planted woodland;
 - retention of key views within and outwith the foothills;
 - size of felling coupes;
 - factors such as agricultural viability, nature conservation and historic sensitivities.
- 5.6.12 These issues are addressed by Forestry Authority woodland design guidance (see section 4.19), and are summarised in the landscape guidelines presented at the end of this section.
- 5.6.13 There is also a need to address the character of existing plantations, many of which were established many decades ago. A particular concern relates to the hillside shelterbelts to the east of the A822 between Crieff and Glen Almond. Here narrow, geometric strips of woodland run vertically up the hillside, one even crossing the hilltop and descending the other side. While such plantations may provide valuable shelter for stock or game, their landscape impact is high. Consideration should be given to removing them, in due course, and perhaps creating new woodlands elsewhere in compensation. Elsewhere, harvesting and replanting will provide an opportunity to remodel some of the more geometric plantations to create more naturalistic and sensitive woodland forms.
- 5.6.14 **Tall structures.** The Lowland Hills are comparatively free of tall structures. The principal exceptions are the high voltage electricity transmission lines which cross the area, and the masts that are sited on high ground overlooking Perth (e.g. near Methven and on Kirton Hill). It is possible that there may be pressure for additional masts as telecommunications traffic grows.

- 5.6.15 At a small scale, wind power has been important in this area for many decades, being harnessed by wind pumps to raise water. With the development of modern wind turbines to generate power, it is possible that this area may come under pressure for wind farm development. Though wind speeds are likely to be significantly lower than in more elevated parts of the Highlands or the Sidlaws/Ochils, it is possible that the lower level of perceived constraint, together with the proximity to the existing electricity distribution network, could favour this area. This would be even more likely if the efficiency of wind turbines continues to improve, thereby making areas with lower wind speeds viable. It is acknowledged that development here could avoid the need to locate turbines in even more sensitive upland areas, or in less sensitive, but more populated areas closer to settlements. It would also mean that, from a distance, and from some directions, turbines would be viewed against a backdrop of higher ground. However, the insensitive development of wind turbines in this area could conflict with the small-scale, historic and deeply rural character of the landscape. It would also weaken and confuse the area's role of providing a transition from the unsettled uplands to the fertile and settled lowland.

LANDSCAPE GUIDELINES

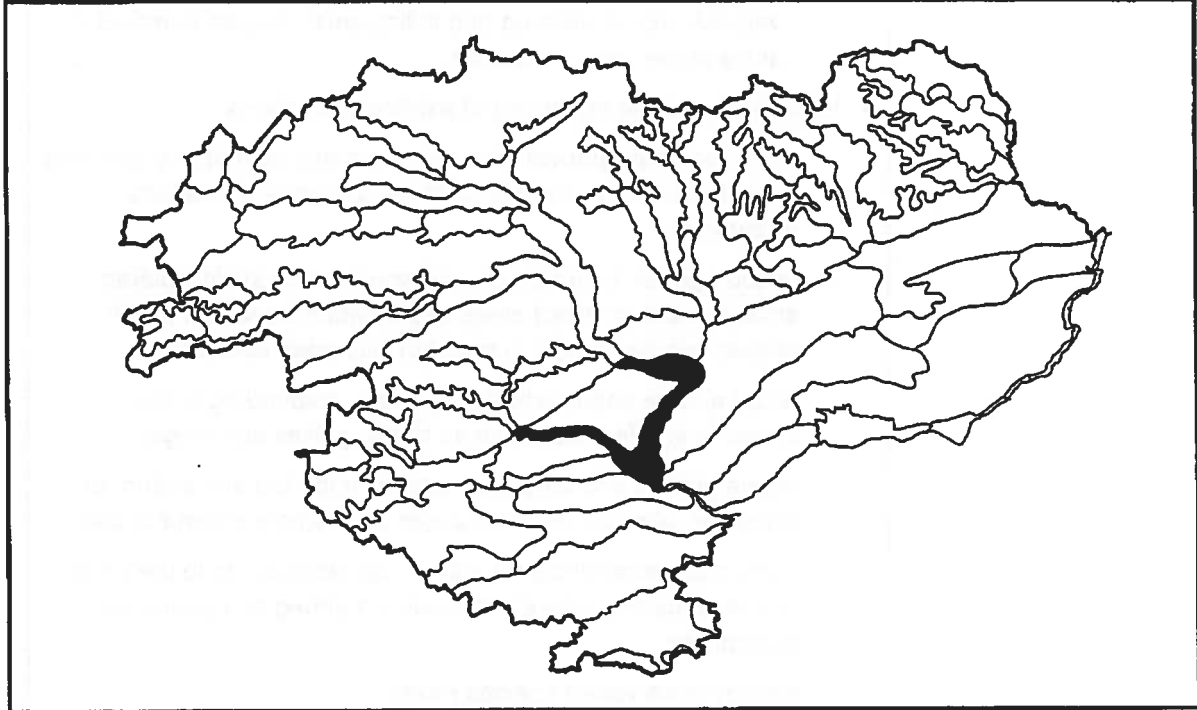
- 5.6.16 The following guidelines reflect the sensitivities of the landscape and the pressures for change acting upon it. They are intended to provide a broad basis for the development of more detailed management strategies. The overall aim of such strategies should be to conserve the small-scale, rural and historic character of the Lowland Hills, recognising their importance in providing a transition zone between the Highlands and the Lowlands.

Agriculture	<ul style="list-style-type: none"> • Maintain the distinction between lowland cereals and highland grazing areas. • Encourage farmers and landowners to maintain and replant trees and farm woodlands. Species to include oak, maple, beech and ash. • Use the agricultural development notification scheme to influence the design, colour, materials, screening and location of new farm buildings. Explore the use of planning conditions attached to new buildings to provide screening where appropriate.
Transport	<ul style="list-style-type: none"> • Where necessary, explore opportunities to provide additional on and off-site screening of major roads. • Where more minor road improvement schemes take place, ensure that hedges, hedgerow trees, gates and other features are re-instated. • Avoid the use of suburban features such as concrete kerbing in a rural setting unless absolutely necessary. Explore more appropriate alternatives. • Develop a road use hierarchy as a basis for management.

<p>Development</p>	<ul style="list-style-type: none"> • Focus new development in existing towns and villages so as to reinforce the historic pattern of settlements and to protect the rural character of other parts of the lowland glens. • Discourage the simplistic grafting of housing estates onto the edge of settlements. Encourage more imaginative schemes which respond to the existing patterns of layout, structure, massing and scale. • Encourage the wider use of vernacular designs, materials and colours, while allowing for modern interpretations of traditional styles. • Consider positive ways of addressing the interface between settlements and the surrounding countryside. These could include: <ul style="list-style-type: none"> - screening; - new buildings which integrate surrounding areas; - key vistas and views; - landmark features; - gateways and approaches. • Where small-scale development is permitted, encourage developers to use local building materials and to adopt local vernacular in respect of density, massing, design, colour and location. Avoid standard or suburban designs and layouts. Assess and adopt existing traditional layouts. Consider the preparation of design guides as supplementary planning guidance. • Encourage the appropriate conversion of redundant farm buildings. Guidance should be provided on the way buildings should be converted (including the provision of drives, gardens etc.) to prevent the suburbanisation of the countryside.
<p>Forestry and woodland</p>	<ul style="list-style-type: none"> • New planting should conform to the Forestry Authority's design guidelines. In particular, it should respond to the small-scale nature of the landscape, complex topography, the importance of views within and out of the hills, and historic and ecological values. • The broad principles of new woodland could include: <ul style="list-style-type: none"> - overall planting strategy that emphasises the transitional character of the Lowland Hills; - focus new planting in lower areas, retaining more open, upland character of areas nearer the Highland Boundary Fault; - consider scope for regeneration of native woodlands on higher ground to provide a transition to more heavily wooded areas;

(Forestry and woodland contd.)	<ul style="list-style-type: none"> - favour a mixture of broad-leaf (oak and ash) and conifer species; - vary the size of planting and felling small coupes to reflect the scale of the local landscape. • With respect to the replanting of existing plantations: <ul style="list-style-type: none"> - encourage the removal of small, geometric plantations, allowing equal increases in planting in more appropriate locations elsewhere; - encourage the rationalisation of woodland to avoid isolated, small to medium-sized areas of plantation woodland which appear very prominent in an otherwise open landscape; - adopt a more naturalistic appearance, responding to the landform and features such as burns, gullies and crags; - create graded and irregular margins at the top and bottom of the slope, allowing views of upper slopes from within the glen; - discourage straight lateral edges - do not plant up to the edge of a land holding where this creates a strong and geometric vertical line; - employ more varied species mixes; - vary the size of felling coupes, with smaller areas on lower slopes.
Tall structures	<ul style="list-style-type: none"> • Assess proposals for aērals, pylons or masts in terms of their visual and landscape impact on the local landscape of the foothills, and the broader landscape of the lowland straths and Highlands. • Encourage telecommunications companies to share facilities where it is evident that this would reduce the overall landscape impact. • Encourage telecommunication companies to develop a strategy for mast provision which reflects the sensitivity of the local landscape. • Encourage the development of a regional strategy for renewable energy, including wind power, in order that the most appropriate types of development and areas come forward.

LOWLAND RIVER CORRIDORS (7)



KEY CHARACTERISTICS

- *well-defined river corridors in broader lowland landscapes*
- *meandering, often incised course through softer sandstones*
- *semi-natural woodland on steeper slopes*
- *rapids, weirs and mills where harder rocks cross the valley*

OBJECTIVE DESCRIPTION		Lowland River Corridors
Physical scale		Narrow corridors up to 3 km wide, containing rivers incised by up to 40 metres; falls and rapids where river crosses bands of harder rocks
Woodland	broad-leaf	Semi-natural woodland on steep incised slopes
	coniferous	A few areas where plantations or policy woodlands extend to the river edge
Agriculture	arable	On higher ground either side of river
	pasture	On higher ground either side of river, on gentler slopes and on a few areas of level floodplain
	fields	Within inner valley, size and shape determined by topography; on higher, level ground, larger and more geometric fields
	field boundaries	Hedges and post-and-wire fences
Settlement pattern		A number of mill settlements sited close to rapids and weirs. Also historic houses and designed landscapes enjoying riverside location
Building materials		Red sandstone
Historic features		Historic houses and designed landscapes, castles and mills
Natural heritage features		Hanging woodlands, rapids
Other landscape features		No notable features
SUBJECTIVE DESCRIPTION		
Views		Corridor
Scale		Small to medium
Enclosure		Semi-enclosed
Variety		Varied
Texture		Textured
Colour		Colourful
Movement		Peaceful
Unity		Unified
'Naturalness'		Undisturbed to tamed

LOCATION

- 5.7.1 Two Lowland River Corridors stand out as having distinctly different characters from the surrounding landscape. The first is the River Tay corridor between the Highland Boundary fault and the Firth of Tay at Perth. The second, which is of a much smaller scale, is the lower section of Glen Almond from the Highland Boundary fault eastwards to Perth.

PHYSICAL CHARACTERISTICS

- 5.7.2 Unlike their upper reaches where both rivers are constrained within glens cut through the hard schists and grits, south of the Highland Boundary Fault they flow onto the softer Old Red Sandstones. Here the rivers have been able to meander more freely, though rising land levels following the end of the last Ice Age have resulted in both rivers developing incised channels. Where the more resistant igneous dykes cross the rivers, rapids and cataracts occur.
- 5.7.3 After crossing the Highland Boundary Fault near Murthly, the Tay swings in a series of broad meanders across a wide, flat floodplain. As it flows south the meanders tighten and the river enters an inner valley up to 40 metres deep. Within this incised channel, there is little or no floodplain and the fertile haughs found upstream are absent. Many of the steep slopes are clothed in deciduous woodland, further increasing the sense of enclosure which cuts the river off from the wider landscape. South of Stormontfield, the Tay valley broadens once more, forming the broad basin with river terraces occupied by Perth and Scone. However, encountering the hard igneous rocks of the Sidlaws, the river has cut a narrow valley, turning eastward to the Carse of Gowrie.

SETTLEMENT AND LAND USE

- 5.7.4 The River Tay has stimulated several phases of settlement. In prehistoric times, it is likely that the fertile haughs of the river attracted hunter-gatherers and the earliest settlers. However, as with other locations close to gateways into the Highlands, the defensive structures of Roman and subsequent eras have left a more lasting mark on the landscape. The strategic importance of Strath Tay, leading both north and west through the uplands is reflected in the presence of a Roman fort at Inchtuthill south of Spittalfield, and a series of smaller castles such as those near Kinclaven and Stanley. Medieval settlement was focused at Perth, a strategic location in the Tay gap, and at the lowest bridging point. The landscape quality of the river corridor contributed to the later development of landscaped estates associated with historic houses such as Murthly, Meikleour and Scone. The series of rapids that are found along the River Tay stimulated the development of watermills, powering Perthshire's textile industry during the industrial revolution. Mills were constructed at several places, most spectacularly at Stanley. Here the river turns through a tight meander, enclosed within a 40 metre deep gorge. A tunnel was built through the neck of the meander, leading water away from a weir to power mills further downstream.
- 5.7.5 The River Almond has some striking similarities with the Tay, reflecting its proximity to the Highlands and its common geological structure. Most notable perhaps is the deep, gorge-like valley that the river has cut through the sandstone and glacial deposits.

Although flowing in a meandering course, the river is entrenched within a valley 40 metres deep until it enters the open floodplain of the Tay above Perth. Many of the slopes are too steep to farm and are clothed in broad-leaf woodland. In the upper part of the glen, the river corridor is relatively unsettled, farms and hamlets clustering along roads on more level ground to the north and south. Fields along the northern side of the valley have a dense network of field boundary trees. The site of a Roman Fort at the western end of this part of the glen and the presence of large houses and institutions such as Glenalmond College, echo the pattern of development seen along the Tay. Furthermore, the River Almond also provided a series of mill sites along its lower reaches, where the river cuts through a series of igneous dykes. Here mills and associated houses are perched alongside the river, concealed from the wider landscape.

FORCES FOR CHANGE

- 5.7.6 This section contains a description of the principal types of change that have affected this landscape type in the recent past or which are likely to affect it in the future. Changes may be positive or negative in terms of their effect on the landscape. The aim of this section is to gain a clear understanding of the nature and direction of change and its likely impact on the essential character and quality of the landscape. This analysis provides the basis for management guidelines to assist other organisations develop more detailed policies for agriculture, forestry and development.
- 5.7.7 **Agriculture.** Agricultural activity within these river corridors is concentrated on higher ground either side of the entrenched river. The network of hedges and hedgerow trees is an essential element of this landscape, extending the texture and variety of the straths up towards the lowland hills. In some areas, however, this structure is in decline with once dense lines of trees becoming gappy and fragmented, and hedges and fences being replaced by 'invisible' post-and-wire fencing. This is noticeable, for example, along the northern side of Glen Almond. Field boundaries on the broad floodplains, where they occur, are often marked by fences, though sometimes boundaries across the valley are marked by shelterbelts or lines of trees.
- 5.7.8 **Transport.** Main roads have tended to avoid the steep-sided and tortuous river corridors, favouring more level routes elsewhere. Where access to the river corridors is possible, it is usually gained by steep narrow roads which serve mills or riverside farms. The steep, twisting nature of these roads is a characteristic of the area and should be conserved where practical.
- 5.7.9 **Development.** The proximity of these areas to Perth, and their attractive, sheltered landscape (the Tay valley is designated as an Area of Great Landscape Value) means that there is some pressure for residential settlement. This is particularly the case to the north of Perth where villages such as Luncarty and Stanley lie close to the A9. Over-development in these areas could undermine the quality of the landscape, and development plans for the area seek to steer additional housing towards existing settlements. Almondbank, Luncarty and Stanley all include areas allocated for future residential development. Furthermore, the Perth Area Local Plan (Perth and Kinross District Council, 1996) raised the possibility of a 'new settlement' (termed Almond Valley Village) between Almondbank and Huntingtower on the north-west edge of Perth. This would result in the Perth Urban Area extending into the Almond Valley.

- 5.7.10 The alignment of the ring road/motorway, and steeply rising ground to the south-west and east broadly defines the physical extent of Perth and contains it within a section of the Tay valley which is relatively concealed within the wider landscape. A somewhat more ambiguous area lies to the north where development has been permitted to the north of the ring road but south of the River Almond. The latter is hidden in woodland, so for people travelling along the A9 there is no obvious physical boundary to the northern part of the town.
- 5.7.11 Concerns about the potential impact of new residential development reflect the patterns of recent growth. Often this has comprised low density, speculative estates of similar or identical dwellings which are crudely grafted onto the edge of these towns. The stark designs (often lacking any reference to vernacular designs or material) are usually unmitigated by planting, screening or landscaping, while the infrastructure of internal roads, footways, drives etc. appear over-engineered and overly suburban. The impact of additional housing in these river corridor areas would have much to do with their layout, scale, variety, materials and vernacular, as well as their location within the landscape. Housing developers should be encouraged to adopt layouts and designs which integrate new dwellings into existing settlements, rather than simply grafting suburban estates onto the edge of villages and hamlets. There is a role for design guides and imaginative design briefs. There may also be further scope for sensitive residential conversions where traditional farm buildings have become redundant, though this will do little to meet the demand for housing in the area as a whole. Again, guidance on the most appropriate means of conversion will be important.
- 5.7.12 **Forestry and woodland.** Woodland is an essential component of this landscape type, comprising a combination of semi-natural woodland, commercial forestry, farm woodland and field boundary trees, policy and estate woodland. The characteristic interplay of woodland, farmland and areas of designed landscape is particularly important.
- 5.7.13 Several areas of river corridor are identified by the Tayside Indicative Forestry Strategy as having potential for new planting. While there may be some scope for additional woodland in these areas, it is important to maintain the overall balance of unplanted and planted areas and to conserve key views into and along the river corridor. It is also important to conserve landscape features such as field systems where these contribute to the grain and texture of the landscape. As elsewhere, there is scope to enhance the appearance of existing plantations as they come forward for harvesting and replanting.
- 5.7.14 **Tall structures.** With the exception of the lines of pylons that cross Glen Almond at two points, this landscape type is relatively free from tall structures. There is unlikely to be significant pressure for wind turbine construction. However, the effect of any proposals on higher ground which are visible from within the river valleys (for example on the Lowland Hills) should be considered carefully. Development of small-scale hydro schemes at former mill sites could reduce pressure for wind turbine development in the wider area.

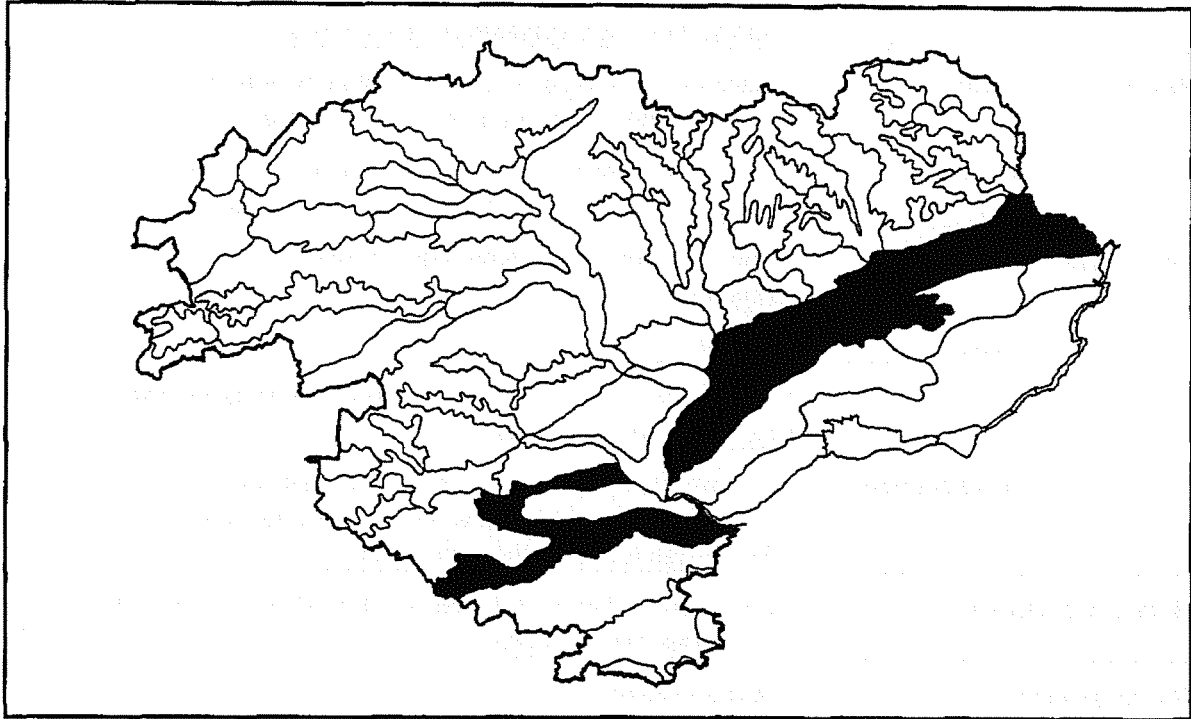
LANDSCAPE GUIDELINES

- 5.7.15 The following guidelines reflect the sensitivities of the landscape and the pressures for change acting upon it. They are intended to provide a broad basis for the development of more detailed management strategies. The overall aim of such strategies should be to conserve the characteristically settled landscape of farmland, woodland and designed landscapes and to ensure that new development is designed to minimise adverse impacts on the landscape.

Agriculture	<ul style="list-style-type: none"> • Discourage improvements which result in further loss of field boundaries or field boundary trees. • Encourage farmers and landowners to replant trees along field boundaries, initially along roads, but also between fields. Species to include oak, maple, beech and ash. Use incentives to compensate for lower yields where mature trees are retained. • Explore development of market for hardwood from field boundary trees. • Use the agricultural development notification scheme to influence the design, colour, materials, screening and location of new farm buildings. Explore the use of planning conditions attached to new buildings to provide screening where appropriate.
Transport	<ul style="list-style-type: none"> • Minimise upgrading or improvement of roads particularly where this involves the creation of cuttings and embankments, or the introduction of additional signage, or features such as concrete kerbing.
Development	<ul style="list-style-type: none"> • Focus new development in existing towns and villages so as to reinforce the historic pattern of settlements and to protect the rural character of other parts of the lowland glens. • Discourage the simplistic grafting of housing estates onto the edge of settlements. Encourage more imaginative schemes which respond to the existing patterns of layout, structure, massing and scale. Encourage the wider use of vernacular designs, materials and colours, while allowing for modern interpretations of traditional styles. • Consider positive ways of addressing the interface between settlements and the surrounding countryside. These could include: <ul style="list-style-type: none"> - screening; - new buildings which address surrounding areas; - key vistas and views; - landmark features;

(Development contd)	<ul style="list-style-type: none"> - gateways and approaches. • Explore the development of Almond Valley Village as a means of addressing the ambiguous pattern of development to the north and north-west of Perth by firming up the distinction between urban and rural and providing clear gateways to the town.
Forestry and woodland	<ul style="list-style-type: none"> • With respect to the replanting of existing plantations on valley slopes: <ul style="list-style-type: none"> - adopt a more naturalistic appearance, responding to the landform and features such as burns, gullies and crags; - create graded and irregular margins at the top and bottom of the slope, allowing views of upper slopes from within the glen; - discourage straight lateral edges - do not plant up to the edge of a land holding where this creates a strong and geometric vertical line; - employ more varied species mixes; - vary the size of felling coupes, with smaller areas on lower slopes. • Consider opportunities for new woodland planting in terms of: <ul style="list-style-type: none"> - the overall balance of woodland and open space; - the relative importance of different areas of existing woodland (e.g. commercial plantation versus policy woodland) and how this would be influenced by an increase in woodland cover; - the importance of key views and features within the landscape; - opportunities for provide screening; - opportunities to link isolated areas of woodland; - agricultural, ecological and historical sensitivities.
Tall structures	<ul style="list-style-type: none"> • Assess proposals for tall structures in terms of their visual and landscape impact on the local landscape of the river corridors. • Explore the scope for small-scale hydro schemes as an alternative to wind power projects. • Where new power or telephone lines are proposed or required, encourage operators to adopt underground cable solutions.

BROAD VALLEY LOWLANDS (10)



KEY CHARACTERISTICS

- *broad straths formed by glacial erosion*
- *undersized, misfit rivers*
- *complex local topography caused by glacial deposition*
- *distinctive red soils and red building stone*
- *influence of large estates, particularly in terms of woodland and policies*
- *dominance of arable and root crops*
- *tree loss weakening landscape character*

OBJECTIVE DESCRIPTION		Broad Valley Lowlands
Physical scale		In the case of Strathmore, up to 10 km wide and 30 km long; Strathallan and Strathearn up to 5 km wide
Woodland	broad-leaf	Extensive broad-leaf woodland limited to inner policy woodland and a few areas of unimproved land
	coniferous	Coniferous plantations on areas of poorer land, especially on valley sides; geometric plantation in Strathallan
Agriculture	arable	Dominant agricultural land uses - cereals, potatoes and oil seed rape
	pasture	Limited
	fields	Medium size, regular, some enlarged; most dating back to parliamentary enclosure
	field boundaries	Characteristically hedges with high density of mature hedgerow trees.; pattern weakened as trees felled. Strathallan fewer hedges and trees
Settlement pattern		Small, often planned, villages, small market/processing towns, and larger market towns
Building materials		Red sandstone
Historic features		Comparatively limited, reflecting intensity of agricultural use
Natural heritage features		Fluvial-glacial landforms. Ecological interest limited to a few unimproved areas
Other landscape features		Large, modern agricultural buildings; dominance of estates and historic houses
SUBJECTIVE DESCRIPTION		
Views		Corridor
Scale		Medium
Enclosure		Open
Variety		Varied to simple
Texture		Textured to smooth
Colour		Colourful
Movement		Active
Unity		Interrupted
'Naturalness'		Tamed

LOCATION

5.10.1 South of the Highland Boundary Fault lie 5 broad lowland valleys or straths. These share a range of common characteristics which set them apart from other valleys and glens. There are, however, significant variations in landscape character within this type, and these are described below. The five areas of Broad Valley Lowlands are:

- Strathmore;
- Strathearn;
- Strathallan;
- the lower South and North Esk river valleys;
- the Pow Water Valley between the Gask Ridge and Keillour Forest.

PHYSICAL CHARACTERISTICS

5.10.2 These areas share a common geological structure, based on the broad band of Old Red Sandstone that runs south-west to north-east through the heart of Tayside. Bounded by harder schists and grits to the north and lavas and tufts to the south, and already lowered by downfaulting, this soft rock was easily eroded by the ice sheets which extended across the region during period of glaciation. These created much wider and deeper valleys than the scale of existing rivers might suggest. At the end of the last Ice Age, retreating ice sheets deposited a considerable amount of drift within these valleys, much of which was further modified by meltwater flows below or around the ice. This created the complex local topography of outwash terraces, eskers and dry valleys that occur in many places today. Much of the glacial material was locally derived and have given rise to the distinctive red soils that are visible when fields are ploughed. Brighter reds tend to be found further north and east.

SETTLEMENT AND LAND USE

5.10.3 While surviving standing stones and other monuments point to the prehistoric use of these areas, most of the present landscape has been substantially modified since medieval times. Valleys such as Strathmore had comprised extensive areas of rough grazing, scrub woodland and unproductive wetland. The process of draining and improving the land was begun in the 10th century when groups of monks came to the area. One of the principal centres was Coupar Angus where a major Cistercian Abbey was founded in 1164, and many of the moors and mires were brought into agricultural use over subsequent centuries. The process of improvement entered a new phase with the parliamentary enclosure of the 18th and 19th centuries, creating the structure of rectilinear fields that are evident today. A characteristic of this period of enclosure was the planting of many trees (oak, beech, chestnut and ash) along field boundaries. These would have given shelter and provided a source of building timber and firewood. Up to 200 years later, where they survive these mature (or even over-mature) trees make a critical contribution to the rich character of the Broad Valley Lowlands. The large estates, with their baronial mansions and castles, designed landscapes, pleasure grounds, ornamental woodlands, avenues and policies make an equally important contribution.

- 5.10.4 The 19th century also saw the rationalisation of estates, including the creation of new villages to accommodate farm workers, and the arrival of the railways. Market towns such as Kirriemuir, Coupar Angus and Forfar experienced growth during this period, reflected in their inner suburbs of Victorian terraces and villas. Agriculture has continued to develop. More and more land has been brought into production. Flood defences have been constructed along rivers, allowing arable cultivation to spread onto the floodplain. The fertility of the soil, allied to favourable climatic conditions have favoured the cultivation of cereals, oil seed rape, soft fruit and potatoes.

VARIATIONS IN LANDSCAPE CHARACTER

- 5.10.5 It is in Strathmore that the distinctive character of the landscape is most evident. From a distance, the area appears as a very broad, flat-bottomed valley enclosed by the Highland Foothills to the north and the rising sweep of the Sidlaws' north-facing dip slope to the south. Where estate planting survives, for example around Glamis, the strath landscape is rich and textured and particularly colourful during spring and autumn. Where the trees have been lost, it is an open and expansive landscape of rectangular fields punctuated with a scatter of large farmsteads. The landscape of the strath contrasts strongly with neighbouring areas of upland, particularly where the woodland structure has survived.
- 5.10.6 Strathearn, extending from Crieff eastwards to the Bridge of Earn has a similar structure to Strathmore. To the south it is enclosed by the steep slopes of the Ochils, while to the north the Gask Ridge separates it from the valley of the Pow Water. There are a number of significant differences, however. The first is scale. Strathearn is considerably narrower and less extensive. Furthermore, the River Earn is a more evident feature in the landscape, its broad meanders swinging back and forth across the floodplain. The strath also accommodates a railway and the main A9 dual carriageway. Where the woodland structure is thin, the road and its traffic are very visible. Overall, however, the strath retains a rich, well-wooded agricultural landscape, particularly towards the east.
- 5.10.7 Strathallan extends from Greenloaning towards Auchterarder. Although the scale is similar to that of Strathearn, the landscape is very much more open, forming a shallow valley between the lowland hills to the north and the smooth, largely unwooded slopes of the Ochils to the south. Arable cultivation predominates and woodland is generally limited to dense, geometric blocks of conifers. In this large-scale, open landscape, this woodland appears sculptural, almost comparable to fields of crops. Along the floor of the strath, the local topography is complex, resulting from extensive fluvio-glacial deposits. Drumlin fields create a landscape of hummocks and small basins. Areas of glacial sands and gravels have been quarried, leaving a network of small lochs.
- 5.10.8 The Pow Water valley, lies between the Gask Ridge and the lowland hills of the Keillour Forest. It is a shallow, small-scale agricultural valley, with field and woodland patterns similar to those of the larger lowland valleys. Much of the valley floor has been drained to provide pastures and arable land.
- 5.10.9 The valleys of the Rivers South Esk and North Esk form a broad area of lowland to the south of the Highland Boundary Fault and enclosed to the south by the high ground to the east of Forfar. Although sometimes included within the broad definition of Strathmore to the west, this area drains eastwards and is separated from Strathmore by a low

watershed around Kirriemuir. More significantly, perhaps, this area is distinguished by its smaller scale, higher proportion of woodland (both broad-leaf and coniferous) and by the well-defined river corridors of the two Esks. The rivers are identified by lines of riverside trees, and by inner terraces. They are separated by a low ridge. Like other straths, the valleys are in both pastoral and arable use.

FORCES FOR CHANGE

5.10.10 This section contains a description of the principal types of change that have affected this landscape type in the recent past or which are likely to affect it in the future. Changes may be positive or negative in terms of their effect on the landscape. The aim of this section is to gain a clear understanding of the nature and direction of change and its likely impact on the essential character and quality of the landscape. This analysis provides the basis for management guidelines to assist other organisations develop more detailed policies for agriculture, forestry and development.

5.10.11 **Agriculture.** Reflecting the dominance of agriculture within this landscape type, it is changing farming practices which have brought the most significant changes to the areas of Broad Valley Lowlands. The principal agents of change have included:

- intensification of arable production;
- concentration on potato growing;
- introduction of 'new' crops and forms of production.

The landscape effects of these changes are described below.

5.10.12 Over recent decades the national policies, allied to the Common Agricultural Policy (CAP), encouraged the expansion of arable production. This was achieved by greater mechanisation, the more extensive use of inputs such herbicides and fertilisers, and a range of capital improvements designed to maximise the area under cultivation. These improvements included some hedgerow removal to create larger fields. Allied to this was a tendency not to replace the once-dense network of hedgerow trees where they resulted in uneven patterns of cereal growth or ripening as a result of shading or water demand. Field boundary trees are also regarded as a liability as they become over-mature and drop branches or suffer wind blow. New techniques also allowed the more intensive use of land throughout the year with the introduction of a wider range of winter crops.

5.10.13 Although the pattern of change has been uneven within the Broad Valley Lowlands, with some estates deliberately conserving the structure of fields, boundaries and boundary trees, and the emphasis of agricultural policies has shifted towards a stabilisation or reduction in cereal production, in some areas the landscape has been denuded of its tree-cover, creating a prairie-like appearance. This weakens the otherwise rich and textured character of many of these lowland areas and dilutes the contrast between the productive, well-treed lowlands and the harsher highlands. It also renders other landscape features such as roads, traffic and buildings much more visible.

5.10.14 Allied to cereal production has been the expansion of potato growing, particularly within Strathmore. Growth and harvesting of this crop sits easily within the farming landscape. There has, however, been a significant increase in the number and scale of agricultural

buildings as a result. After harvesting, potatoes are typically stored until market conditions favour selling some months later. Many farms in the straths now include a number of very large modern sheds which overtower the older farm buildings and which are often visible over a considerable distance. They are frequently painted white.

5.10.15 Recent decades have also seen a diversification of arable production with the introduction of new crops, principally oil seed rape. The vivid yellow of this crop during flowering creates a very visible and often extensive feature in the landscape. While opinions are mixed about the nature of this impact, it is comparatively short-lived. Other changes in agricultural practice include the move towards free-range stock keeping, particularly of pigs in areas of lighter soils. The animals are typically brought onto cereal fields after harvesting and are allowed to roam within areas delineated by electric fences. While many welcome the more humane treatment of such animals, the landscape impact of over-grazed fields and the scatter of metal pig arcs could be of concern if this practice expands significantly.

5.10.16 **Transport.** Several of the Tayside straths incorporate major roads which enjoy comparatively level routes through the Broad Valley Lowlands. The A9 primary route, which is dual carriageway for much of its length, runs along Strathallan and Strathearn, while the A94 runs through Strathmore. The large scale of the straths means that the impact of these major roads is less than it might otherwise have been. The broad curves and sinuous alignments seem to echo the generous proportions of the landscape. Having said that, the road structures (including embankments, cuttings and overbridges) are clearly impositions upon the lowland agricultural landscape. There appears to have been little attempt to use either roadside or off-site planting to integrate the roads into the broader structure of the landscape.

5.10.17 The noise and movement of traffic using these routes have a major influence on the character of the local landscape in areas adjoining the roads. Such roads also result in an increase in pressure for development, particularly around junctions and where pockets of land are trapped between settlements and the road corridor. The future impact of the roads is likely to increase as traffic grows and there is pressure to upgrade junctions to provide grade separated access.

5.10.18 More minor roads also raise concerns, including:

- the landscape impact of village bypasses (e.g. the A94 at Glamis) both in terms of the road itself and the view of the settlement from the road;
- the failure to re-establish hedges and hedgerow trees where widening schemes have been implemented;
- the increasingly common practice of including concrete kerbing along the edges of minor rural roads, introducing a suburbanising influence into the countryside.

5.10.19 **Development.** Most development within the lowland straths is concentrated within existing settlements. These include historic market towns such as Rattray, Forfar and Brechin, which have grown at the crossroads of important routes and which often provide gateways to upland areas, and a series of smaller agricultural villages, many of which were established in the 18th and 19th centuries following enclosure, agricultural improvement and the arrival of the railways. Many of these settlements are closely

associated with the surrounding landscape, both in terms of the materials that are used (typically red sandstones among older buildings) and their market function. Development outside these settlements is comparatively limited, confined to farmsteads and a scatter of agricultural dwellings.

5.10.20 As noted elsewhere in this report, older settlements make use of local building materials and reflect local building vernacular. More recent developments on the edge of settlements (for example that to the south of Glamis) tend to owe little to local tradition, often comprising low density estates of houses built in a style that can be found throughout the UK. Future decades are likely to see continued demand for residential development, potentially increasing the impact of new development on the landscape. There may be scope to focus new development within some of the 19th century 'planted' villages, many of which never reached their anticipated size. Alternatively, there may be potential to echo the Victorian movement and create a small number of new villages in key locations.

5.10.21 **Minerals.** The lowland straths include substantial deposits of fluvio-glacial material, some of which has been exploited to provide material for building. Sites currently being worked include those to the west of Auchterarder in Strathallan (where a series of lochans have been formed in worked-out areas) and near Kingsmuir, immediately to the east of Forfar. Although such workings inevitably have a local landscape impact, their broader effect is limited. This would change if it proved viable to expand mineral working more broadly.

5.10.22 **Forestry and woodland.** The fertile nature of these lowland areas, and the consequent dominance of agriculture, means that woodland is limited in extent. The exceptions include:

- the rich legacy of hedgerow trees, many of which are up to 200 years old;
- the less fertile Strathallan where geometric plantations of conifers are found;
- the policy woodlands associated with major estates;
- the native birch woodland found on the pockets of unimproved land within the straths.

5.10.23 The issue of hedgerow trees is closely allied to agricultural change and, as such, has been discussed above. However, it is worth noting that even where such trees survive, they are now reaching maturity or are even over-mature. Phased replanting and felling will be required if the stock of trees is not to dwindle further.

5.10.24 As noted above, the large-scale and rectilinear landscape of Strathallan means that it is one of the few parts of Tayside where rigidly geometric conifer plantations do not appear out of place. Policy woodland is an important aspect of a landscape where woodland cover is decreasing. Retention and management should be encouraged. The fragments of native birch woodland should be conserved for their natural heritage value and because of the insight they provide as to the landscape which would have prevailed prior to enclosure.

5.10.25 **Tall structures.** Tall structures such as masts or wind turbines are unlikely to present a significant threat to the landscape within the Broad Valley Lowlands. However, it is possible that further proposals may come forward for developments on higher ground adjoining the valleys. These could have an impact on the character of the straths. It is also possible that proposals for additional power lines may come forward over time, particularly since this would avoid more exposed upland areas and would achieve 'backclothing' of pylons against the hills.

LANDSCAPE GUIDELINES

5.10.26 The following guidelines reflect the sensitivities of the landscape and the pressures for change acting upon it. They are intended to provide a broad basis for the development of more detailed management strategies. The overall aim of such strategies should be to conserve and restore the characteristic landscape of hedged fields, hedgerow trees, avenues and policy woodlands. It is important to maintain the contrast between the rich lowland landscapes and the neighbouring areas of harsh upland and enclosed glen.

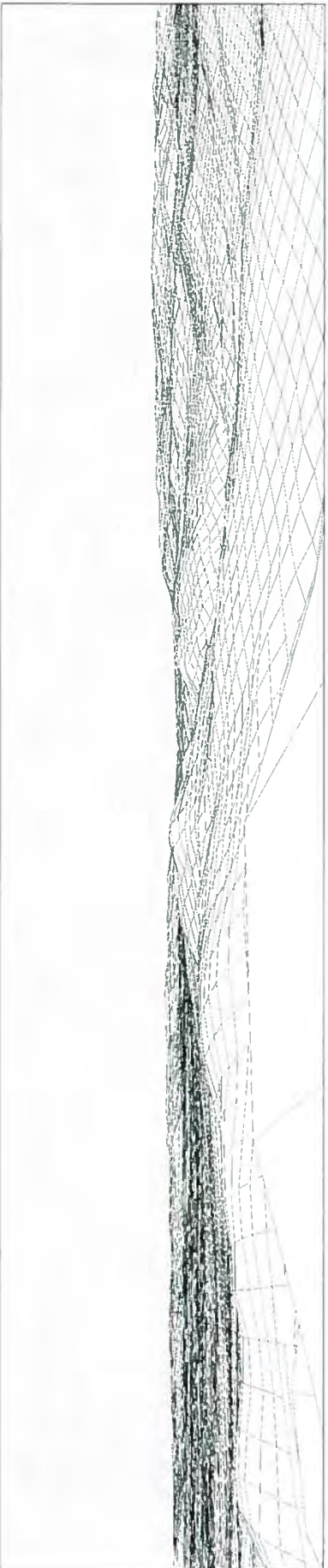
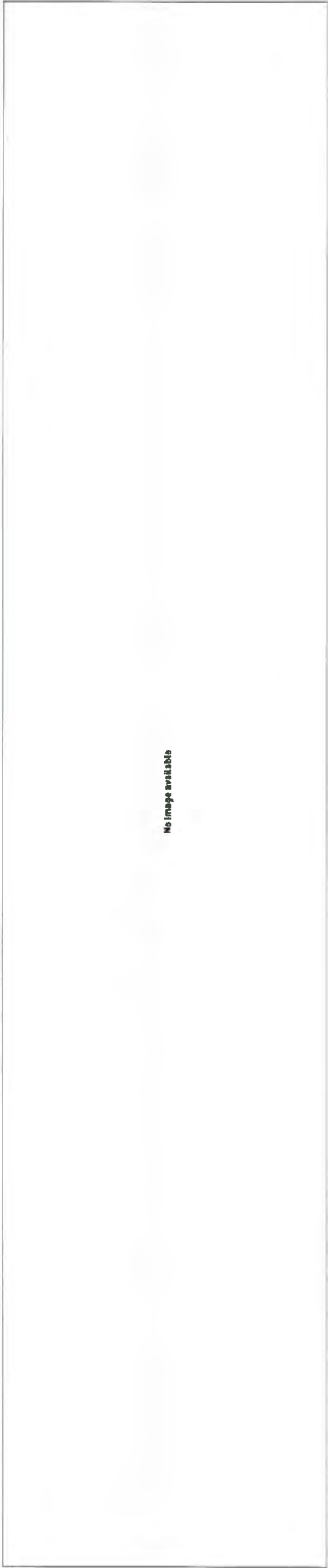
Agriculture	<ul style="list-style-type: none"> discourage improvements which result in further loss of field boundaries or field boundary trees; encourage farmers and landowners to replant trees along field boundaries, initially along roads, but also between fields; species to include oak, sycamore, beech and ash; use incentives to compensate for lower yields where mature trees are retained; explore the opportunities to increase woodland cover by creating new woodland belts, particularly where there is a need to screen development; explore development of market for hardwood from field boundary trees; discourage over-concentration of oil seed rape and similar crops; monitor growth of open air pig keeping; use the agricultural development notification scheme to influence the design, materials, screening and location of new farm buildings; explore the use of planning conditions attached to new buildings to re-establish hedgerow trees.
--------------------	--

Transport	<ul style="list-style-type: none"> • Encourage on-site and off-site planting to better integrate major roads into the landscape and to provide screening of traffic. • Ensure that further proposals for improvements such as dualling or the provision of grade separated junctions are assessed in terms of their wider landscape impact. Where major, unmitigatable impacts exist, explore alternative solutions including traffic management and traffic calming. • Where new bypasses are proposed, consider the severing effect of the road on its setting. Consider also the view of settlements from the new road. • Where road improvement schemes take place, ensure that hedges and hedgerow trees, together with other features such as milestones, finger posts and gates are reinstated. • Avoid the use of suburban features such as concrete kerbing in a rural setting unless absolutely necessary. Explore more appropriate alternatives.
Development	<ul style="list-style-type: none"> • Encourage new development to reinforce the existing settlement pattern, focused on market towns and smaller villages. • New residential development should respond to the morphology of existing settlements (e.g. nucleated market settlements, grid-iron 19th century new villages). Explore the need and scope for a small number of new villages, echoing those established in the 19th century. • Encourage developers to use local building materials and to adopt local vernacular in respect of density, massing, design, colour and location. While red sandstones predominate, there are local variations which reflect subtle changes in the character of the local geology. Avoid standard designs and layouts. Consider the preparation of design guides as supplementary planning guidance.
Minerals	<ul style="list-style-type: none"> • Monitor future demand for mineral working. Ensure that any schemes that come forward are restoration-led and are located so as to minimise landscape impacts during operation.
Forestry and woodland	<ul style="list-style-type: none"> • As a matter of urgency, encourage a phased programme of replanting, managing and, where necessary, felling hedgerow trees, so as to maintain and restore the historic legacy of strath trees. • Maintain, where appropriate, the rectilinear woodland areas in Strathallan. Elsewhere, discourage significant and extensive new afforestation. • Retain and manage surviving pockets of native birch woodland. • Examine the potential to create an integrated pattern of new small woodlands and woodland belts in the most open areas.

<p>Tall structures</p>	<ul style="list-style-type: none"> • Assess proposals for aerials, masts or wind turbines in terms of their visual and landscape impact on the lowland straths. • Encourage telecommunications companies to share facilities where it is evident that this would reduce the overall landscape impact. • Encourage telecommunication companies to develop a strategy for mast provision which reflects the sensitivity of the local landscape. • Underground cable solutions should be considered in preference to pylon lines across the arable landscape.
-------------------------------	--

APPENDIX F

Photoview Wireframes and Photomontages



Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295306, 726818

Viewpoint Location Map

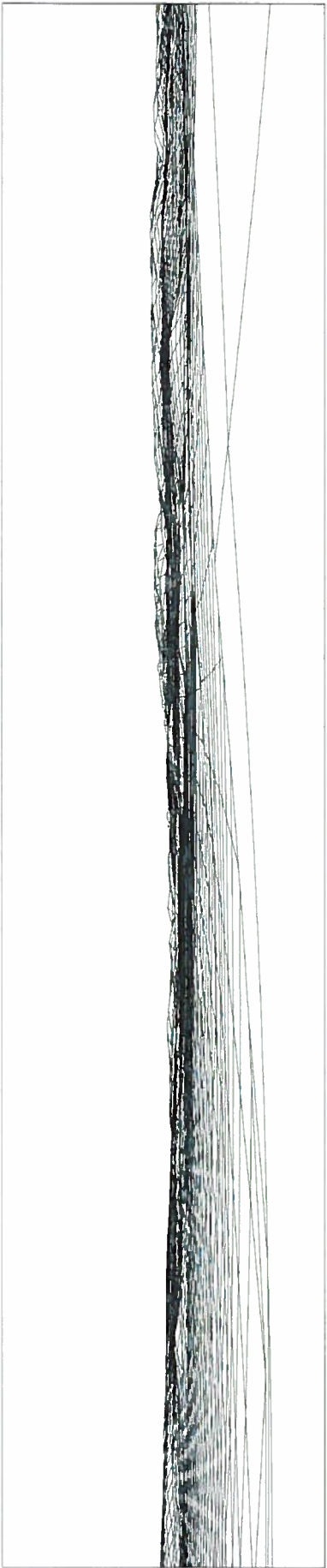
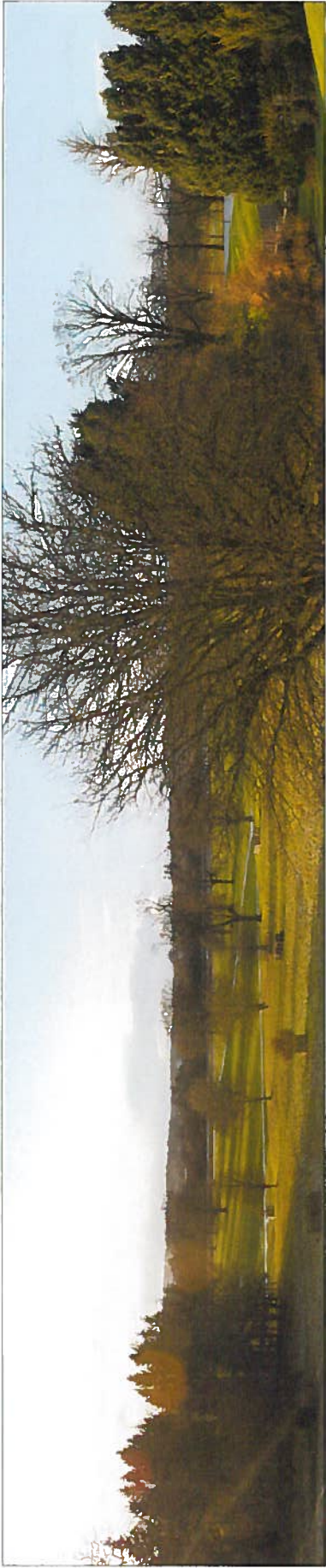
Viewpoint 1
View looking south west from Brinam Hill

Viewpoint Information
OS Grid Reference: 203224, 746088
Viewpoint height: 316m
Distance to nearest turbine: 15,452m
No. of hubs theoretically visible: 1
No. of blades theoretically visible: 1
Angle of view: 90 degrees
View bearing: 210.27 degrees
Correct viewing distance: 620mm

Drumstick Wind Turbine
CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 30/01/2012	CD042_19-A
Sheet 1 of 1	

Pegasus
Environmental



For correct perspective viewing, this image must be viewed at a distance of 1.200mm with eye level correct through the centre of the image. These photographs have been taken using a Canon SD 900 camera with a 3.0mm lens. Document dimensions 170mm x 270mm.

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295304, 724818

Viewpoint Location Map

Viewpoint 2
View looking west from Stone Palace
Historic Garden

Viewpoint Information

Date & time of photograph: 04.12.11 @ 15:40
OS Reference: 211354, 724535

Viewpoint height: 10m
Distance to nearest turbine: 15.915m
No. of hubs theoretically visible: 1
No. of blade tips theoretically visible: 1
Angle of view: 16 degrees
View bearing: 265.3 degrees
Correct viewing distance: 400mm

Drumick Wind Turbine

CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 26.01.2012	C.5312_19-A

Sheet 1 of 2

Pegasus
Environmental

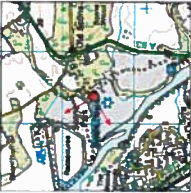


Photomontage

For correct perspective viewing, this image must be viewed at a distance of 400mm with one eye, whilst covered through the same rubber. These photographs have been taken using a Canon 5D full frame sensor camera with a fixed 50mm lens. Document dimensions 1750mm x 277mm.

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295304, 774818

Viewpoint Location Map



Viewpoint 2
View looking west from Scone Palace
Historic Garden

Viewpoint Information

Date & time of photograph: 04.12.18 15.40
OS Reference: 311256, 745235
Viewpoint height: 180m
Distance to nearest turbine: 15.915m
No. of hubs theoretically visible: 1
No. of blade tips theoretically visible: 1
Angle of view: 90 degrees
View bearing: 285.3 degrees
Correct viewing distance: 400mm

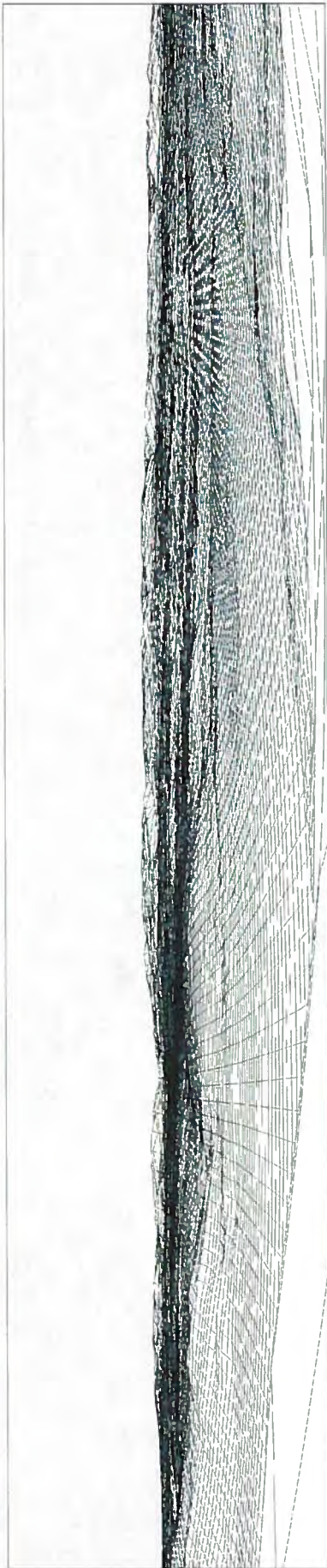
Drumstick Wind Turbine



Drawn by: AD	Checked by: DB
Date: 30.01.2012	C:\B312_1\A
Sheet 2 of 2	Pegasus Environmental



Baseline Photograph



Wireframe

For correct perspective viewing, this image must be viewed at a distance of 420mm with one eye whilst cued through the sightfinder. These patterns have been taken using a Canon 50mm lens at 50mm. Document dimensions 178mm x 277mm

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295306, 724818

Viewpoint Location Map

Viewpoint 3
View looking west from Kinross Hill Perth

Viewpoint Information

Date & time of photograph: 06.12.11 @ 14.51
OS Reference: 21599, 722838
Viewpoint height: 285m
Distance to nearest turbine: 18.723m
No. of hubs theoretically visible: 1
No. of blades theoretically visible: 1
Angle of view: 10 degrees
View bearing: 287.65 degrees
Correct viewing distance: 420mm

Drumstick Wind Turbine

Drawn by: AD	Checked by: DB
Date: 30.01.2012	C:\B12_1\A-A

Sheet 1 of 2

Pegasus Environmental



Photomontage

For correct perspective viewing, this image must be viewed at a distance of 400mm with one eye, whilst turned through the same angle. These photographs have been taken using a Canon 5D full frame sensor camera with a fixed 50mm lens. Cropped dimensions (756mm x 177mm).

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295306, 724818

Viewpoint Location Map

Viewpoint 3

View looking west from Kinross Hill Perth

Viewpoint Information

Date & time of photography: 04.12.11 @ 14.51
OS Reference: 313599, 722828
Viewpoint height: 208m
Distance to nearest turbine: 18,723m
No. of hubs theoretically visible: 1
No. of blades theoretically visible: 1
Angle of view: 98 degrees
View bearing: 287.65 degrees
Correct viewing distance: 400mm

Drumstick Wind Turbine

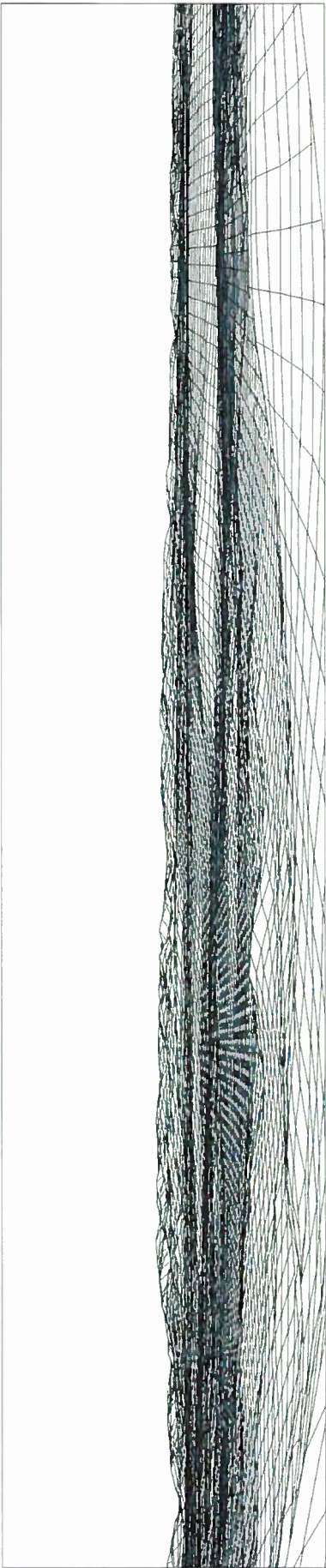
CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 26.01.2012	CBS12_17-A
Sheet 2 of 2	<div><div>Pegasus</div><div>Environmental</div></div>

1290



Baseline Photograph



For correct perspective viewing, this image must be viewed at a distance of 1.20m with one eye, whilst viewed through the camera view. These photographs have been taken using a Canon 50 Ml. lens at 50mm lens. Document dimensions 178mm x 277mm

Wireframe

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295304, 724818

Viewpoint Location Map


Viewpoint 4
View looking north west from Dunning

Viewpoint Information
Date & time of photograph: 04.12.11 @ 13.15
OS Reference: 202374, 713072
Viewpoint height: 207m
Distance to nearest turbine: 15.93m
No. of blades theoretically visible: 1
No. of blades type theoretically visible: 1
Angle of view: 89 degrees
View bearing: 329.8 degrees
Correct viewing distance: 400m

Drumlick Wind Turbine
CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 26.01.2012	C.B312, 1/A

Sheet 1 of 2
pegasus
Environmental

1291



Phenomenalage

For correct perspective viewing, this image must be viewed at a distance of 400mm with one eye, whilst turned through the same radius. These photographs have been taken using a Canon SD 140 10 megapixel camera with a fixed 5.8mm lens. Document dimensions (750mm x 177mm)

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295306, 724818

Viewpoint Location Map

Viewpoint 4

View looking north west from Dunning

Viewpoint Information

Date & time of photograph: 04.12.11 @ 13.15
OS Reference: 303276, 713072
Viewpoint height: 209m
Distance to nearest turbine: 15.937m
No. of hubs theoretically visible: 1
No. of blades theoretically visible: 1
Angle of view: 98 degrees
View bearing: 329.8 degrees
Correct viewing distance: 400mm

Drumnick Wind Turbine

CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 20.01.2012	CER12_19-A
Sheet 2 of 2	

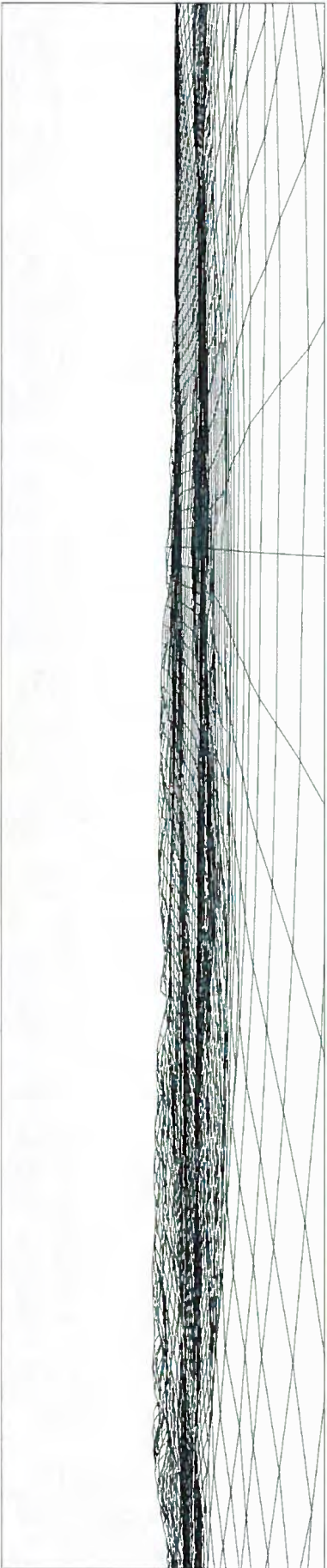
Pegasus

Environmental

1292



Baseline Photograph



Wireframe

For correct perspective viewing, the image must be viewed at a distance of 420mm with one eye, whilst viewed through the wireframe. The photographs have been taken using a Canon 5D III from a vantage point of 1750mm x 1750mm.

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295306, 724818

Viewpoint Location Map

Viewpoint 5
View looking north from access track at base of Simpsonville Hill

Viewpoint Information
Date & time of photograph: 04/12/11 @ 12:50
OS Reference: 294552, 713111
Viewpoint height: 87m
Distance to nearest turbine: 14,107m
No. of hubs theoretically visible: 1
No. of blades theoretically visible: 1
Angle of view: 18 degrees
View bearing: 344.3 degrees
Correct viewing distance: 400mm

Drumlick Wind Turbine

Drawn by: AD	Checked by: DB
Date: 20.01.2012	C.0312 - IV-A

Sheet 1 of 2



Photomontage

For correct perspective viewing, this image must be viewed at a distance of 480mm with one eye, whilst viewed through the same radius. These photographs have been taken using a Canon 5D full frame sensor camera with a fixed 50mm lens. Circumscat dimensions (756mm x 177mm).

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295306, 724818

Viewpoint Location Map



Viewpoint 5

View looking north from access track at base of Sempleside Hill

Viewpoint Information

- Date & time of photograph: 06.12.11 @ 17:20
- OS Reference: 298432, 733111
- Viewpoint height: 97m
- Distance to nearest turbine: 14,107m
- No. of hubs theoretically visible: 1
- No. of blade tips theoretically visible: 1
- Angle of view: 10 degrees
- View bearing: 344.3 degrees
- Correct viewing distance: 480mm

Drummett Wind Turbine



Drawn by: AD	Checked by: DB
Date: 26.01.2012	C.0312_17-A
Sheet 2 of 2	Pegasus Environmental



Baseline Photograph



Wireframe

For derived photographs viewing, the image must be viewed at a distance of 1.20m with one eye whilst viewed through the same radius. These photographs have been taken using a Canon 5D Mk II using a Canon 50mm lens. Document dimensions 179mm x 279mm

Height to Tip - 77m Height to Hub - 50m

Co-ordinates - 295304, 724818

Viewpoint Location Map

Viewpoint 6

View looking north, north east from
Aubourne Collegiate Church.

Viewpoint Information

Date & time of photograph: 04.12.11 @ 11.05

OS Reference: 250972, 713246

Viewpoint height: 10m

Distance to nearest turbine: 14,007m

No. of hubs theoretically visible: 1

No. of blades theoretically visible: 1

Angle of view: 10 degrees

View bearing: 14.4 degrees

Correct viewing distance: 400m

Drumick Wind Turbine

CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 26.01.2012	C.0312_IP-A

Sheet 1 of 2

Pegasus
Environmental



Photomontage

For correct perspective viewing, this image must be viewed at a distance of 400mm with one eye occluded (turned through the same ribbon). These photographs have been taken using a Canon SD 1400 camera with a fixed 50mm lens. © Drumnick demograph (750mm x 377mm)

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295304, 724818

Viewpoint Location Map

Viewpoint 6

View looking north, north east from
Tullibardine Collegiate Church,
Auchtermuchty

Viewpoint Information

Date & time of photograph: 06.12.11 @ 11.05

OS Reference: 290722, 713484

Viewpoint height: 18m

Distance to nearest turbine: 14,007m

No. of hubs theoretically visible: 1

No. of blades theoretically visible: 1

View bearing: 14.4 degrees

Correct viewing distance: 400mm

Drumnick Wind Turbine

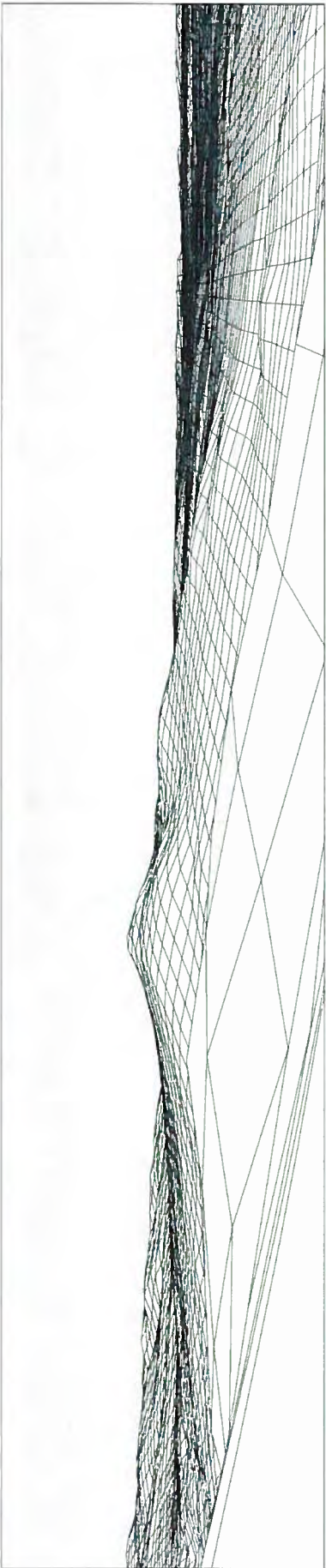
CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 30.01.2012	C0012_19-4
Sheet 2 of 2	<div><div>Pegasus</div><div>Environment</div></div>

1296



Baseline Photograph



Wireframe

For correct perspective viewing, this image must be viewed at a distance of 420mm with eye, whilst viewed through the camera cable. These photographs have been taken using a Canon 5D Mk II using a camera with a fixed 50mm lens. Document dimensions 1780mm x 277mm.

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295304, 724918

Viewpoint Location Map

Viewpoint 7
View looking north east from the Knock of Crieff

Viewpoint Information
Date & time of photograph: 07.12.11 01.13.05
OS Reference: 287536, 723534
Viewpoint height: 73m
Distance to nearest turbine: 8.26km
No. of blades theoretically visible: 0
No. of blades tips theoretically visible: 0
Angle of view: 79 degrees
View bearing: 41.4 degrees
Correct viewing distance: 400m

Drumlick Wind Turbine

CLEARWINDS

Drawn by: AD	Checked by: CB
Date: 20.01.2012	C.0312, 1Y-A

Sheet 1 of 2

Pegasus Environmental



Photomontage

For correct perspective viewing, this image must be viewed at a distance of 400mm with one eye, whilst viewed through the same tripod. These photographs have been taken using a Canon G2 full frame camera camera with a 170mm lens. Exposure 1/2000s, f/2.8, ISO 100.

Height to Tip - 77m
Height to Hub - 50m
Co-ordinates - 215306, 774818

Viewpoint Location Map



Viewpoint 7
View looking north east from the Kiosk of
Crail

Viewpoint Information

Date & time of photograph: 07/11/10 13:05
OS reference: 283500 72254
Viewpoint height: 228m
Distance to nearest turbine: 8.74km
No. of hubs theoretically visible: 0
No. of blades theoretically visible: 0
Angle of view: 19 degrees
View bearing: 61.6 degrees
Correct viewing distance: 400mm

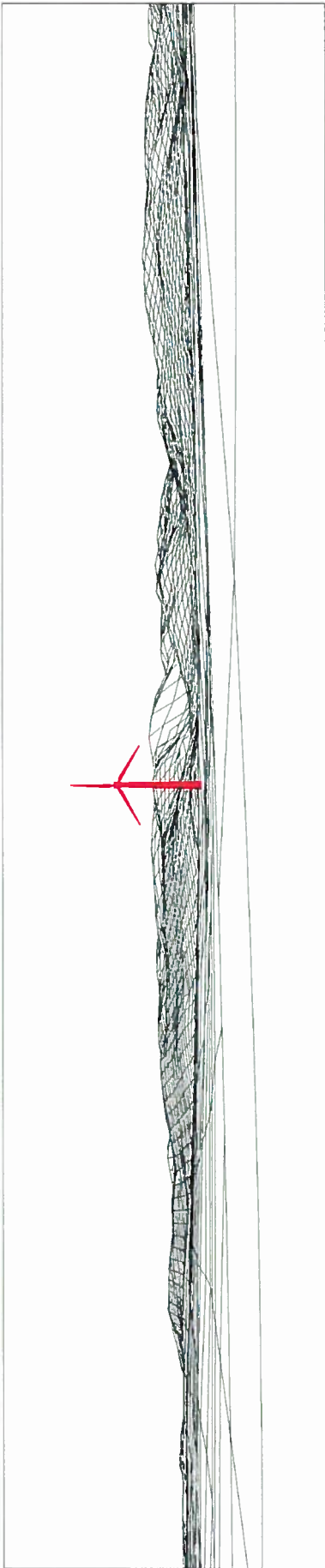
Drumstick Wind Turbine

CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 30/01/2012	CDM2: JF-A
Sheet 2 of 2	Pegasus Environmental



Baseline Photograph



Wireframe

For current perspective viewing, this image must be viewed at a distance of 1200mm with one eye, whilst viewed through the camera in situ. Use photographs have been taken using a Canon 5D Mk II from a camera with a lens of 50mm lens. 3D virtual distance 1700mm x 1770mm.

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295304, 724818

Viewpoint Location Map

Viewpoint B
View looking north west from residential properties at Sludobh

Viewpoint Information
Date & time of photograph: 07.12.11 @ 11.50
OS Reference: 295304, 724818
Viewpoint height: 177m
Distance to nearest turbine: 500m
No. of hubs theoretically visible: 1
No. of blade tips theoretically visible: 1
Angle of view: 19 degrees
View bearing: 274.8 degrees
Correct viewing distance: 1200mm

Drumlick Wind Turbine

CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 30.01.2012	CJ332_19-A

Sheet 1 of 2

Pegasus Environmental



Photomontage

For correct perspective viewing, this image must be viewed at a distance of 400mm with one eye whilst viewed through the same cable. These photographs have been taken using a Canon 5D Mark II sensor camera with a 50mm lens. Exposure 1/2500sec f/2.8 ISO 100

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295305, 724818

Viewpoint Location Map



Viewpoint 8
View looking north west from residential properties at Sludubh

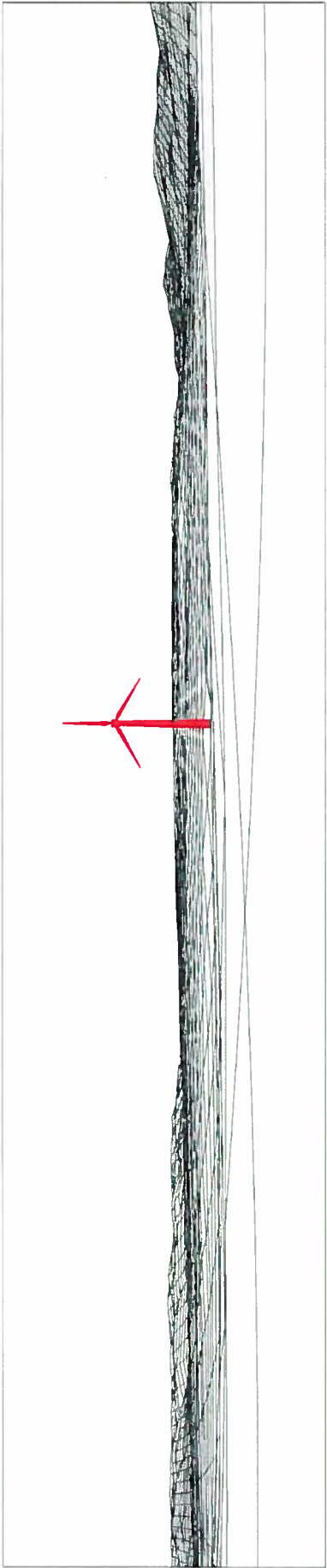
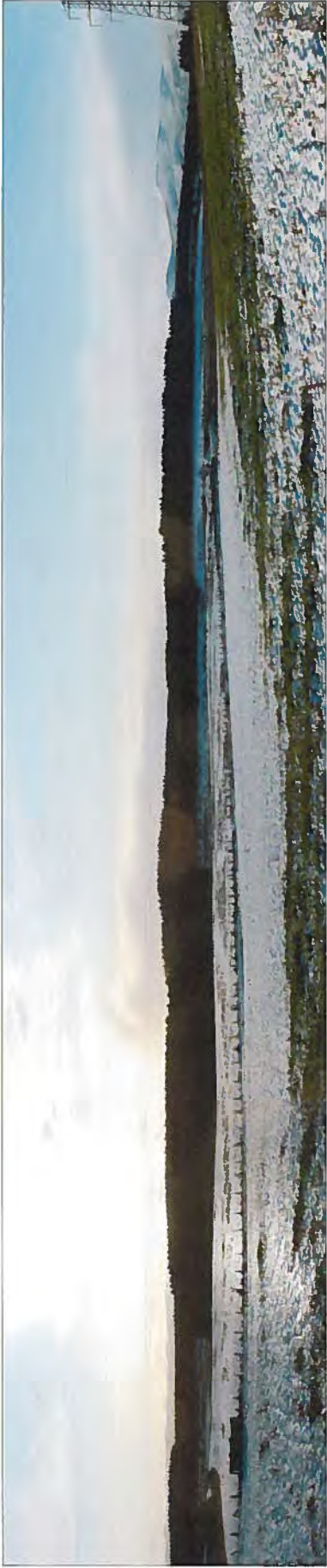
Viewpoint Information

Date & time of photograph: 07/12/11 @ 11:50
OS Reference: 295305, 724818
Viewpoint height: 177m
Distance to nearest turbine: 500m
No. of hubs theoretically visible: 1
No. of blade tips theoretically visible: 1
Angle of view: 90 degrees
View bearing: 274.7 degrees
Correct viewing distance: 400mm

Drumstick Wind Turbine



Drawn by: AD	Checked by: DB
Date: 30.01.2012	CDM2: JH-A
Sheet 2 of 2	Pegasus Environmental



For current participation viewing, this image must be viewed at a distance of 120m with eye eye whilst viewed through the author's lens. These photographs have been taken using a Canon 5D Mark II camera with a lens 50mm lens. Document dimensions 170mm x 277mm

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295306.724818

Viewpoint Location Map

Viewpoint 9
View looking south west from residential properties at Drumlick

Viewpoint Information
Date & time of photograph: 07.12.11 @ 14.10
OS Reference: 295306.724818
Viewpoint height: 210m
Distance to nearest turbine: 521m
No. of hubs theoretically visible: 1
No. of blade tips theoretically visible: 1
Angle of view: 89 degrees
View bearing: 211.5 degrees
Correct viewing distance: 100m

Drumlick Wind Turbine

CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 26.01.2012	C8142 JV-A

Sheet 1 of 2

Pegasus Environmental



Photomontage

For correct perspective viewing, this image must be viewed at a distance of 600mm with one eye whilst viewed through the same radius. These photographs have been taken using a Canon SD 1100 digital camera with a fixed 60mm lens. Document dimensions (150mm x 210mm)

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295304, 726818

Viewpoint Location Map



Viewpoint 9

View looking south west from residential properties at Drumnick

Viewpoint Information

Date & time of photograph 07/12/11 09:14:19
OS Reference 295305, 727787
Viewpoint height 20m
Distance to nearest turbine 521m
No. of hubs theoretically visible 1
No. of blade tips theoretically visible 1
Angle of view 18 degrees
View bearing 221.5 degrees
Correct viewing distance 600mm

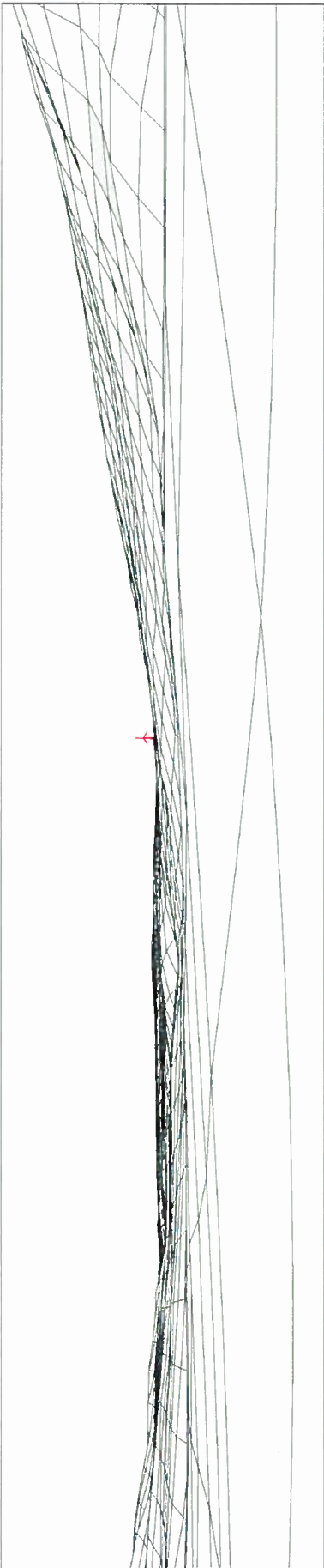
Drumnick Wind Turbine



Drawn by: AD	Checked by: DB
Date: 20/01/2012	CS12_13-A
Sheet 2 of 2	Pegasus Construction



Baseline Photograph



Wireframe

For current photographs viewing, this image must be viewed at a distance of 100mm with eye, which covered through the same as this. These photographs have been taken using a Canon 5D Mark II camera with a lens 50mm lens. Document dimensions (700mm x 270mm)

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295304, 724818

Viewpoint Location Map

Viewpoint 10
View looking south east from the B8043

Viewpoint Information
Date & time of photograph: 07.12.11 @ 12:55
OS Reference: 292397 729748
Viewpoint height: 189m
Distance to nearest turbine: 3.517m
No. of hubs theoretically visible: 1
No. of blade tips theoretically visible: 1
Angle of view: 95 degrees
View bearing: 130.2 degrees
Correct viewing distance: 450mm

Drumlick Wind Turbine

Drawn by: AD	Checked by: DB
Date: 30.01.2012	C.0342_19-A

Sheet 1 of 2

Pegasus
Environmental

1303

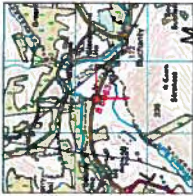


For correct perspective viewing, this image must be viewed at a distance of 400mm with one eye, whilst opened through the same ratios. These photographs have been taken using a Canon 5D full frame sensor camera with a fixed 50mm lens. Cropped dimensions 1750mm x 1277mm

Photomontage

Height to Tip - 77m Height to Hub - 50m
Coordinates - 295304, 724818

Viewpoint Location Map



Viewpoint 10
View looking south east from the B8063

Viewpoint Information

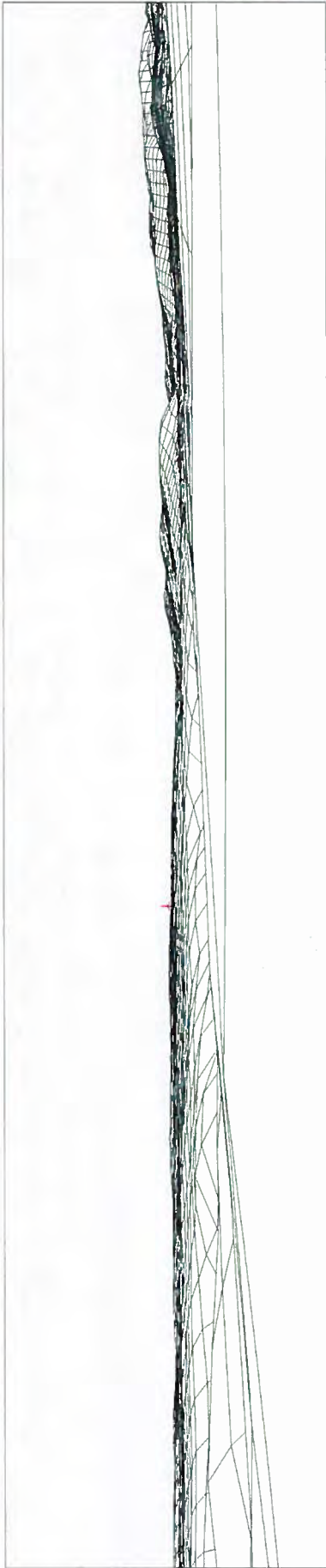
Date & time of photograph: 07.12.11 @ 13.55
OS Reference: 723279, 723268
Viewpoint height: 189m
Distance to nearest turbine: 3.517m
No. of hubs theoretically visible: 1
No. of blade tips theoretically visible: 1
Angle of view: 90 degrees
View bearing: 120.2 degrees
Correct viewing distance: 400mm

Drumnick Wind Turbine

CLEARWINDS	
Drawn by: AD	Checked by: DB
Date: 30.01.2012	CS042_19-A
Sheet 2 of 2	Pegasus Environmental



Baseline Photograph



Wireframe

For correct perspective viewing, this image must be viewed at a distance of 200mm with one eye, whilst viewed through the same paper. These photographs have been taken using a Canon 5D Mk3 camera with a lens 50mm lens. Document dimensions (720mm x 270mm)

Height to Tip - 77m Height to Hub - 50m

Co-ordinates - 295326, 724818

Viewpoint Location Map

Viewpoint 11

View looking south east from residential properties at Harriehill

Viewpoint Information

Date & time of photograph: 07/12/11 @ 11:10

OS Reference: 246378, 729332

Viewpoint height: 150m

Distance to nearest turbine: 4,150m

No. of hubs theoretically visible: 1

No. of blades theoretically visible: 1

Angle of view: 90 degrees

View bearing: 250 degrees

Correct viewing distance: 400mm

Drumick Wind Turbine

Drawn by: AD	Checked by: OS
Date: 20.01.2012	C.0302_V1-A

Sheet 1 of 2

Pegasus Environmental



PhantomImage

For correct perspective viewing, this image must be viewed at a distance of 400mm with one eye whilst viewed through the same radius. These photographs have been taken using a Canon G2 full frame sensor camera with a fixed 50mm lens. Diagonal dimensions (750mm x 271mm)

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295304, 724818

Viewpoint Location Map

Viewpoint 11

View looking south east from residential properties at Harrietfield

Viewpoint Information

Date & time of photograph: 07/12/11 @ 11:10

OS Reference: 298273, 729732

Viewpoint height: 15m

Distance to nearest turbine: 4,155m

No. of hubs theoretically visible: 1

No. of blades theoretically visible: 1

Angle of view: 98 degrees

View bearing: 250 degrees

Correct viewing distance: 400mm

Drumnick Wind Turbine

CLEARWINDS

Drawn by: AD	Checked by: GS
Date: 26.01.2012	C.0312_1P-4
Sheet 2 of 2	<div><div>Pegasus</div><div>Environmental</div></div>



Baseline Photograph



Wireframe

For correct perspective viewing, this image must be viewed at a distance of 100mm with one eye whilst viewed through the camera tube. These photographs have been taken using a Canon 5D Mk II camera camera with a fixed 50mm lens. Document dimensions 120mm x 279mm

Height to Tip - 77m Height to Hub - 50m
Co-ordinates - 295306, 724818

Viewpoint Location Map

Viewpoint 12
View looking north west from the access
Roman Road to the A1

Viewpoint Information
Date & time of photograph: 04.11.11 19:14:10
OS Reference: 304731 721829
Viewpoint height: 134m
Distance to nearest turbine: 11.042m
No. of hubs theoretically visible: 1
No. of blades theoretically visible: 1
Angle of view: 95 degrees
View bearing: 300 degrees
Correct viewing distance: 400mm

Drumick Wind Turbine

CLEARWINDS

Drawn by: AD	Checked by: DB
Date: 20.01.2012	C.0302_11-A

Sheet 1 of 2

Pegasus
Environmental



Photomontage

For direct perspective viewing, the image must be viewed at a distance of 400mm with one eye, whilst crouched through the same radius. These photographs have been taken using a Canon 60 fuel frame camera fitted with a fixed 50mm lens. Document dimensions 1756mm x 277mm

Height to Tip - 70m Height to Hub - 50m
Coordinates - 255304, 728818

Viewpoint Location Map



Viewpoint 12
View looking north west from the access
Roman Road to the A9

Viewpoint Information

Date & time of photograph 03.12.11 @ 14.10
OS Reference 36023, 721629
Viewpoint height 134m
Distance to nearest turbine 11.8k2m
No. of hubs theoretically visible 1
No. of blades tips theoretically visible 1
Angle of view 70 degrees
View bearing 300 degrees
Correct viewing distance 400mm

Drumnick Wind Turbine

CLEARWINDS	
Drawn by: AD	Checked by: DB
Date: 30.01.2012	CD032_19-A
Sheet 2 of 2	Pegasus Environmental

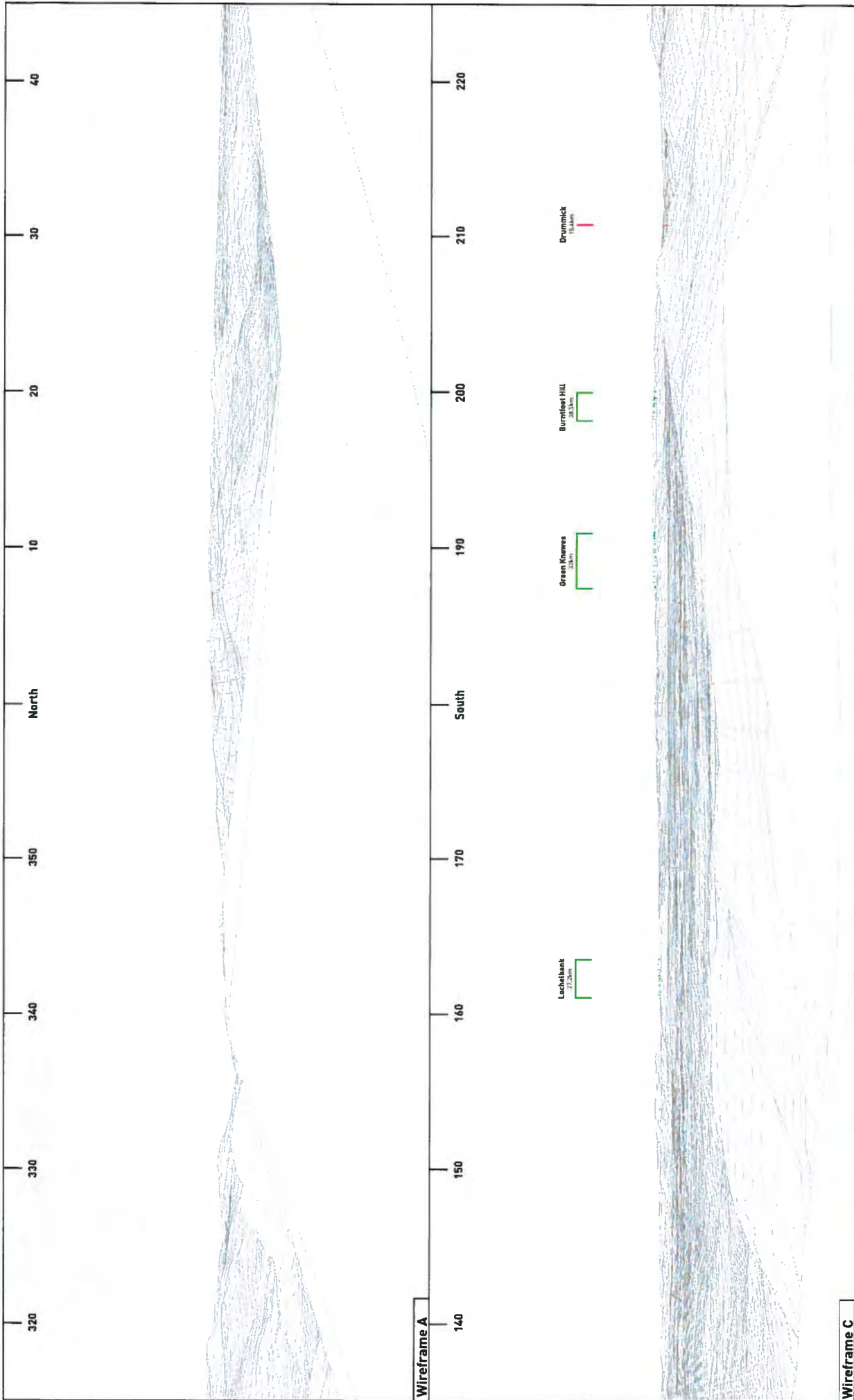
APPENDIX G

Cumulative ZTV and Wireframes

Cumulative Wireframes

CLEARWINDS





Viewpoint 1
View looking south west from Brinam Hill

Proposed Windfarm
 Operational Windfarm
 Consented Windfarm

Viewpoint Information

OS Reference: 303224, 740088

Viewpoint height: 396m

Distance to nearest turbine: 6904m Stewart Tower

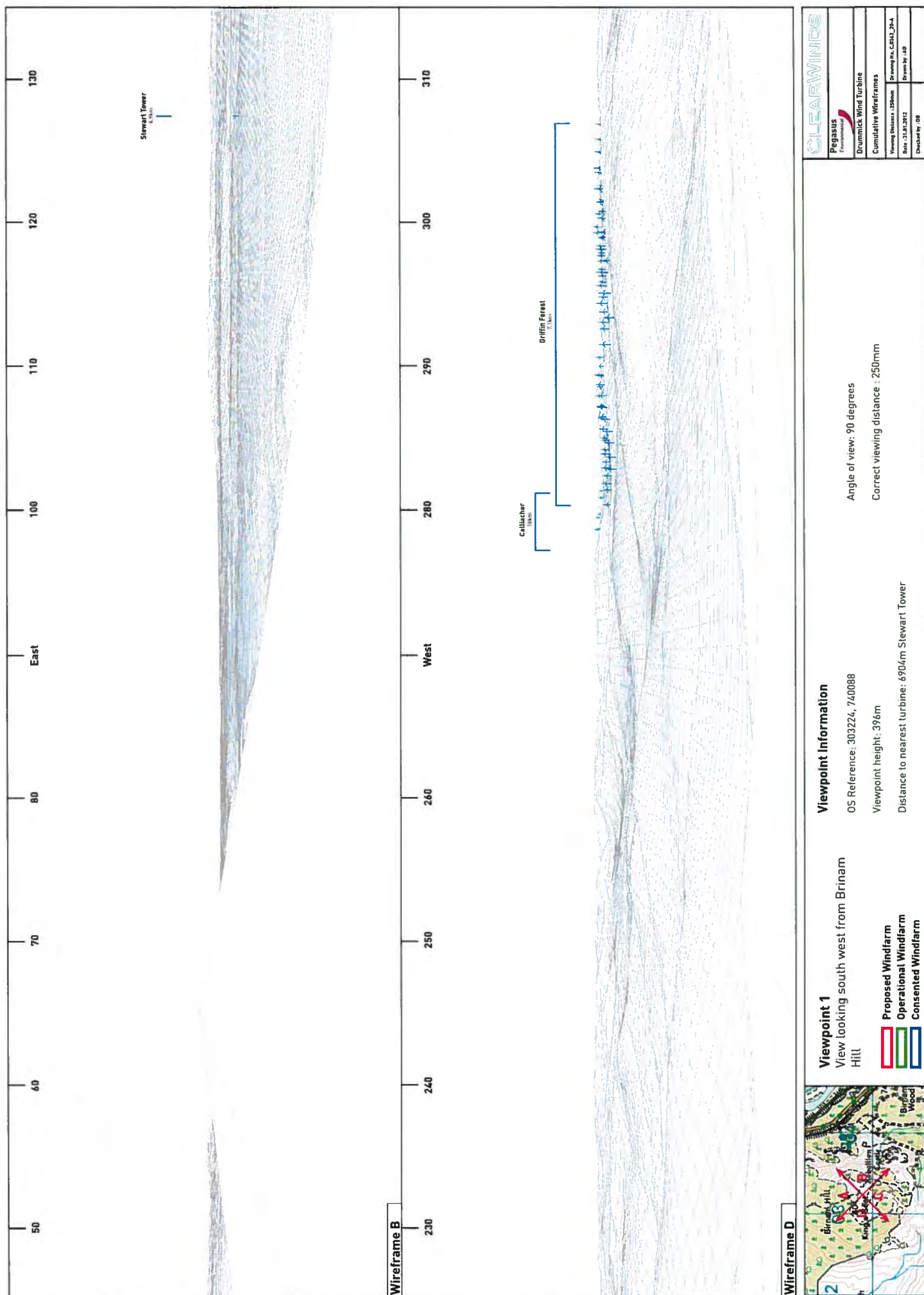
Angle of view: 90 degrees

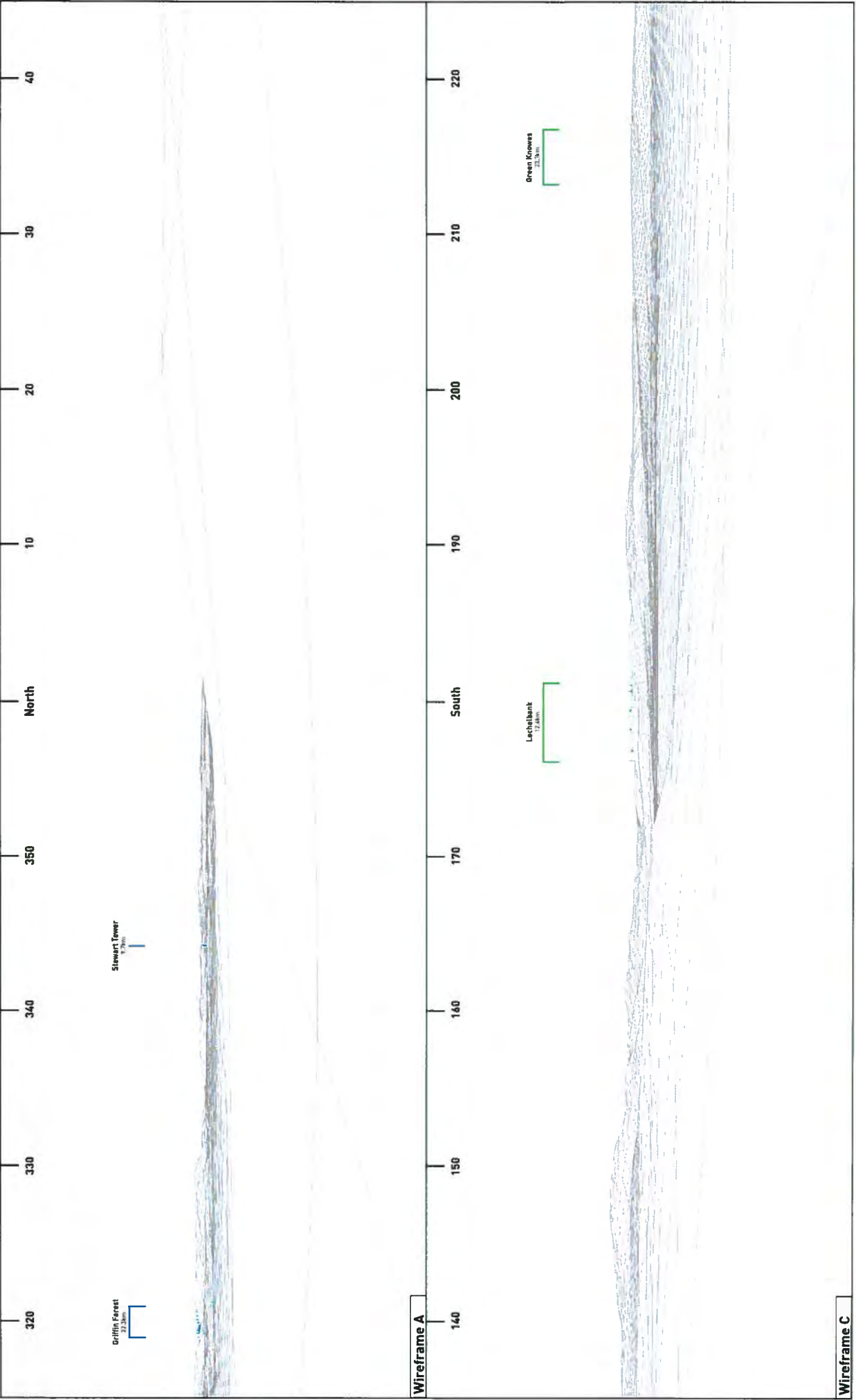
Correct viewing distance : 250mm



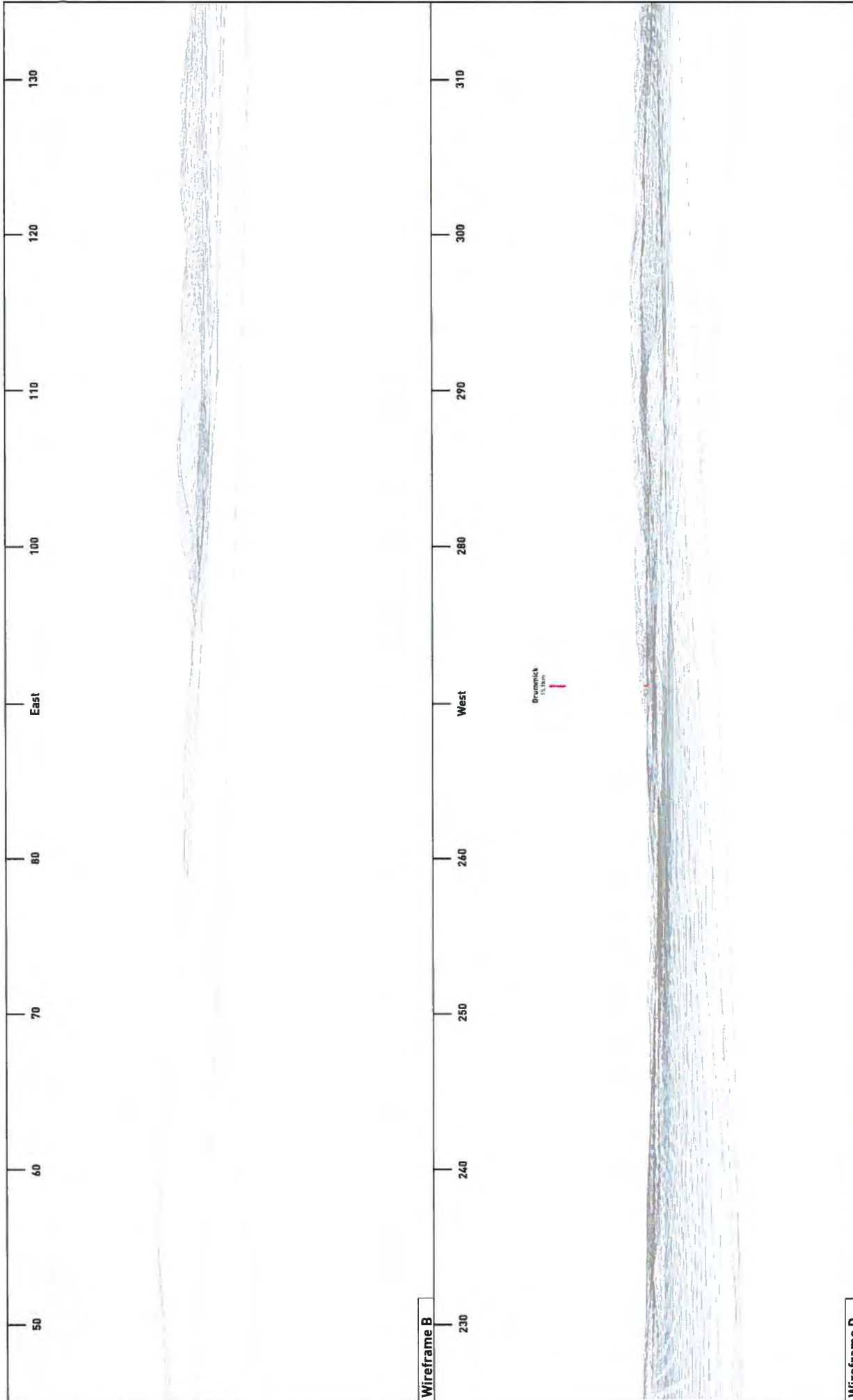


Pegasus Environmental	
Drumnick Wind Turbine	Cumulative Wireframes
Viewing Distance : 250mm	Drawing No. C.0012_2012
Date : 17.01.2012	Drawn by : AD
Checked by : DB	

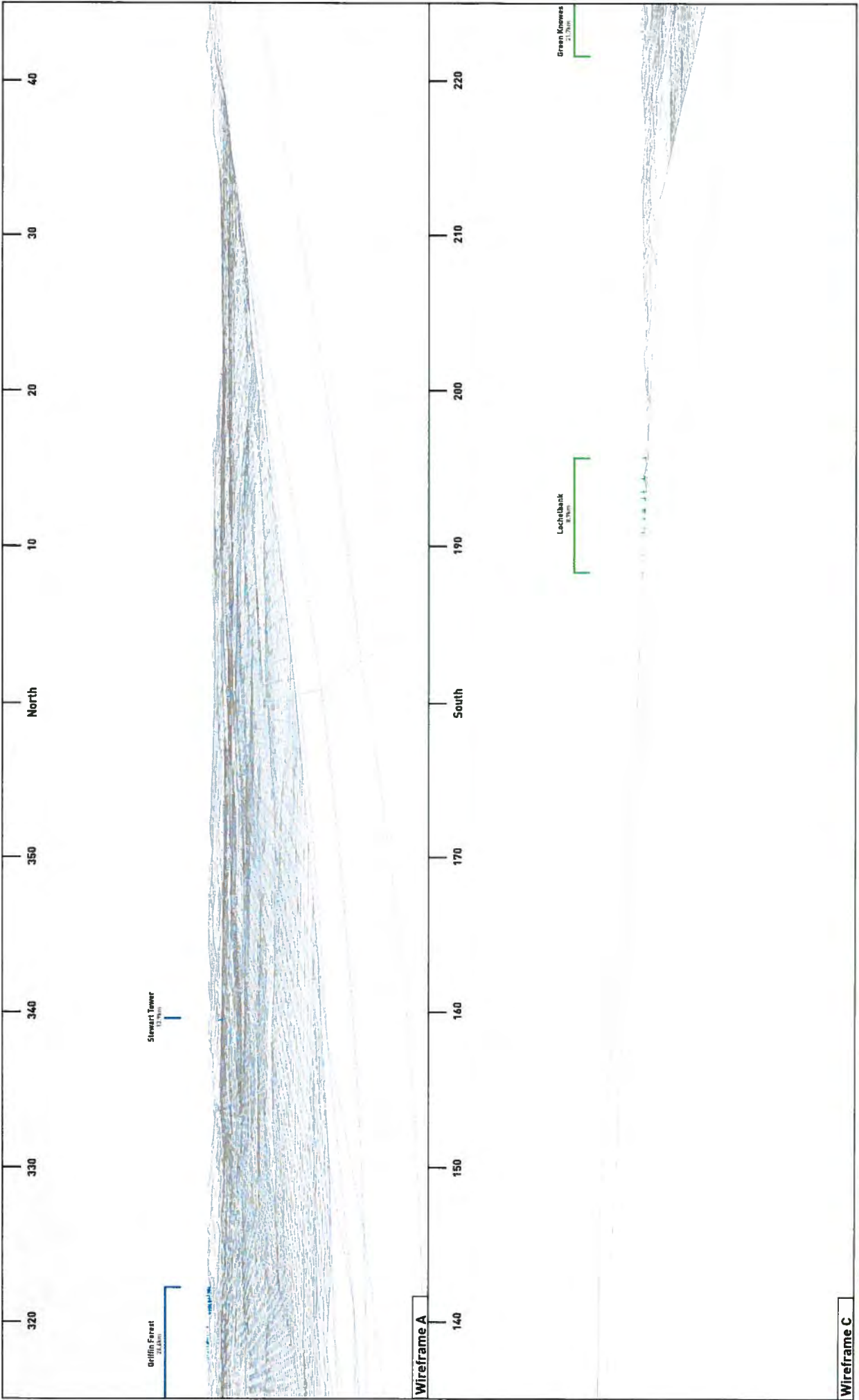




		Viewpoint 2 View looking west from Scone Palace Historic Garden		Proposed Windfarm		Operational Windfarm		Consented Windfarm	
		Viewpoint Information		OS Reference: 311356, 726535		Viewpoint height: 10m		Distance to nearest turbine: 9723m Stewart Tower	
		Angle of view: 90 degrees		Correct viewing distance : 250mm					
		Drumtick Wind Turbine							
		Cumulative Wireframes							
		Pegasus Environmental		Planning Ref. C.2042.20-4		Date : 21.01.2012		Drawn by : AB	



	<p>Viewpoint 2 View looking west from Scone Palace Historic Garden</p> <p>Proposed Windfarm Operational Windfarm Consented Windfarm</p>	<p>Viewpoint Information</p> <p>OS Reference: 311356, 726535</p> <p>Viewpoint height: 10m</p> <p>Distance to nearest turbine: 9723m Stewart Tower</p>	<p>Angle of view: 90 degrees</p> <p>Correct viewing distance : 250mm</p>	<p>CLEARWINDS</p> <p>Pegasus Environmental</p> <p>Drumlick Wind Turbine</p> <p>Cumulative Wireframes</p> <p>Version: 1.0 Date: 13.08.2012 Checked by: JDB</p>
--	---	--	--	---



Wireframe A

Wireframe C

Viewpoint 3
View looking west from Kinnoul Hill
Perth

Proposed Windfarm

Operational Windfarm

Consented Windfarm

Viewpoint Information

OS Reference: 313599, 722828

Viewpoint height: 208m

Distance to nearest turbine: 8949m Lochelbank

Angle of view: 90 degrees

Correct viewing distance : 250mm

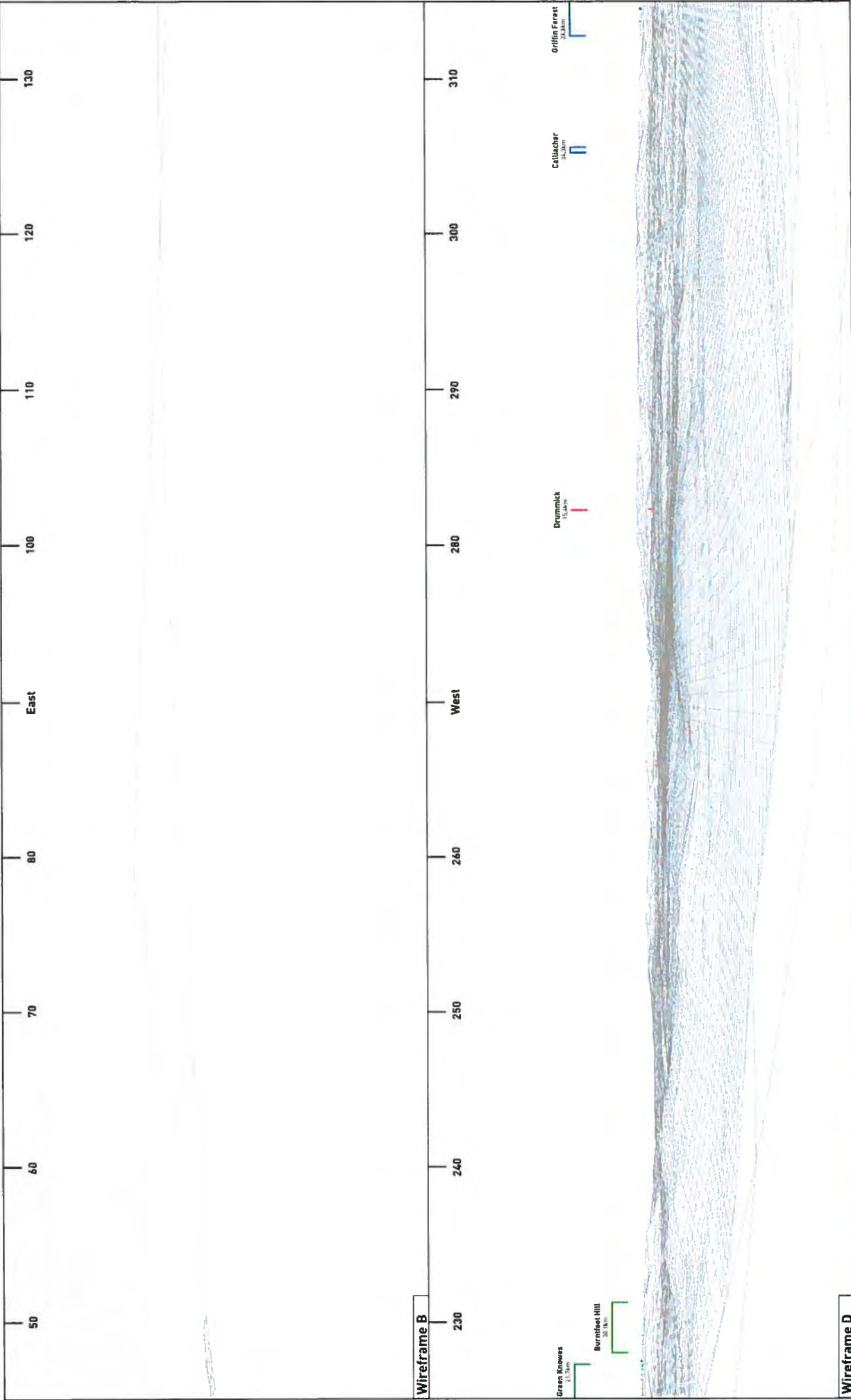
CLEARWINDS


Pegasus
Environmental

Drumlick Wind Turbine

Cumulative Wireframes

Viewing Distance : 150mm	Drawing No. C4813_30-4
Date : 31.01.2012	Drawn by : AD
Checked by : SB	





Viewpoint 3
View looking west from Kinnoul Hill
Perth

Proposed Windfarm
Operational Windfarm
Consented Windfarm

Viewpoint Information

OS Reference: 313599, 722828
Viewpoint height: 208m
Distance to nearest turbine: 8949m Lochelbank

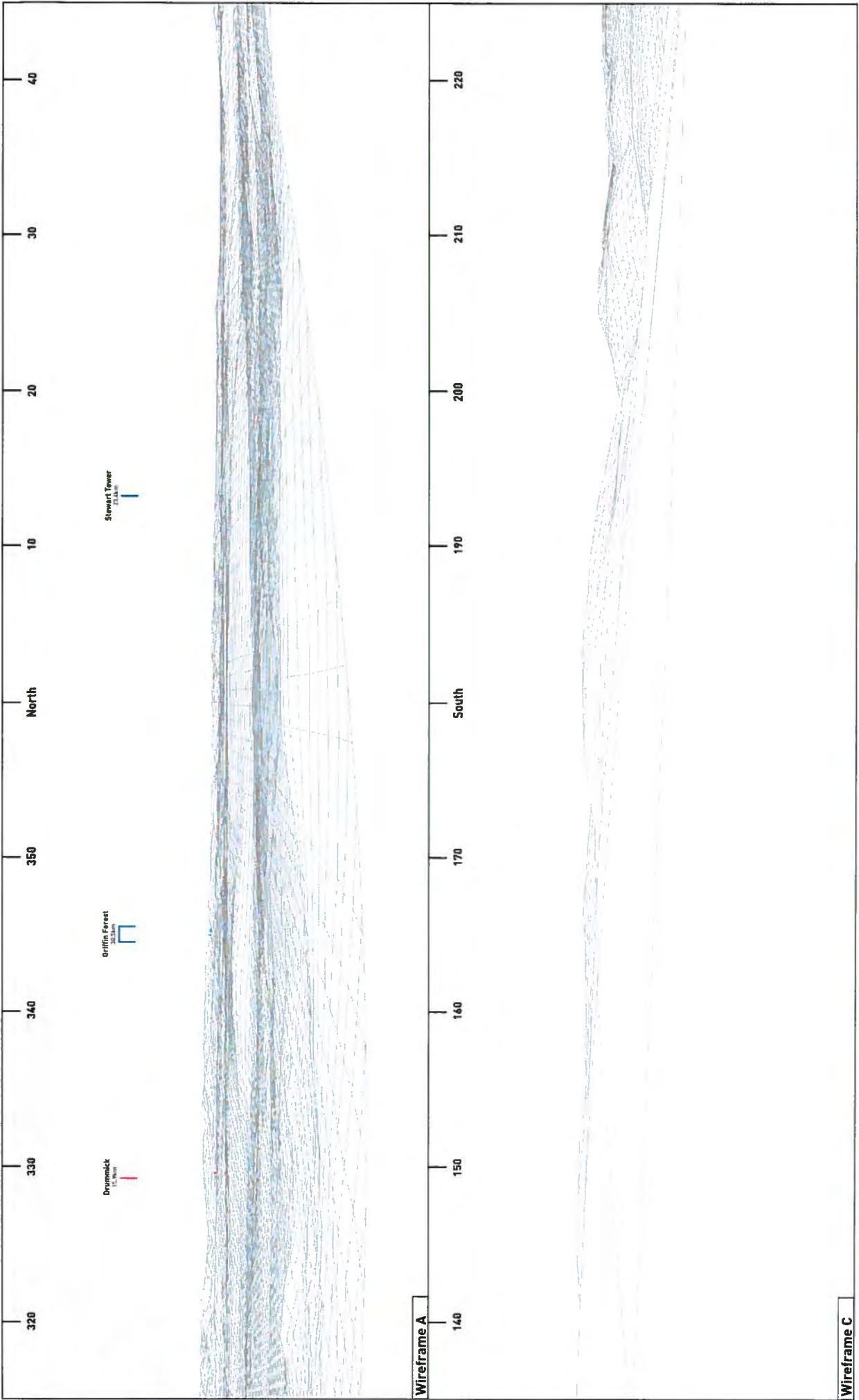
Angle of view: 90 degrees
Correct viewing distance : 250mm

CLEARWINDS

Pegasus
Environmental
Drumlick Wind Turbine
Cumulative Wireframes

Viewed Distance : 250mm
Date : 13.01.2012
Checked by : JB

Drawn by : C. 2012_2014
Drawn by : JB

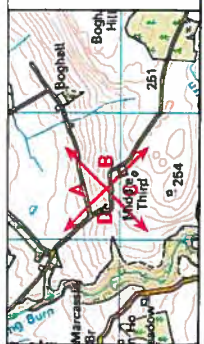


Viewpoint 4
View looking north west from Dunning

Proposed Windfarm
Operational Windfarm
Consented Windfarm

Viewpoint Information
05 Reference: 303376, 713072
Viewpoint height: 209m
Distance to nearest turbine: 15,939m

Angle of view: 90 degrees
Correct viewing distance : 250mm

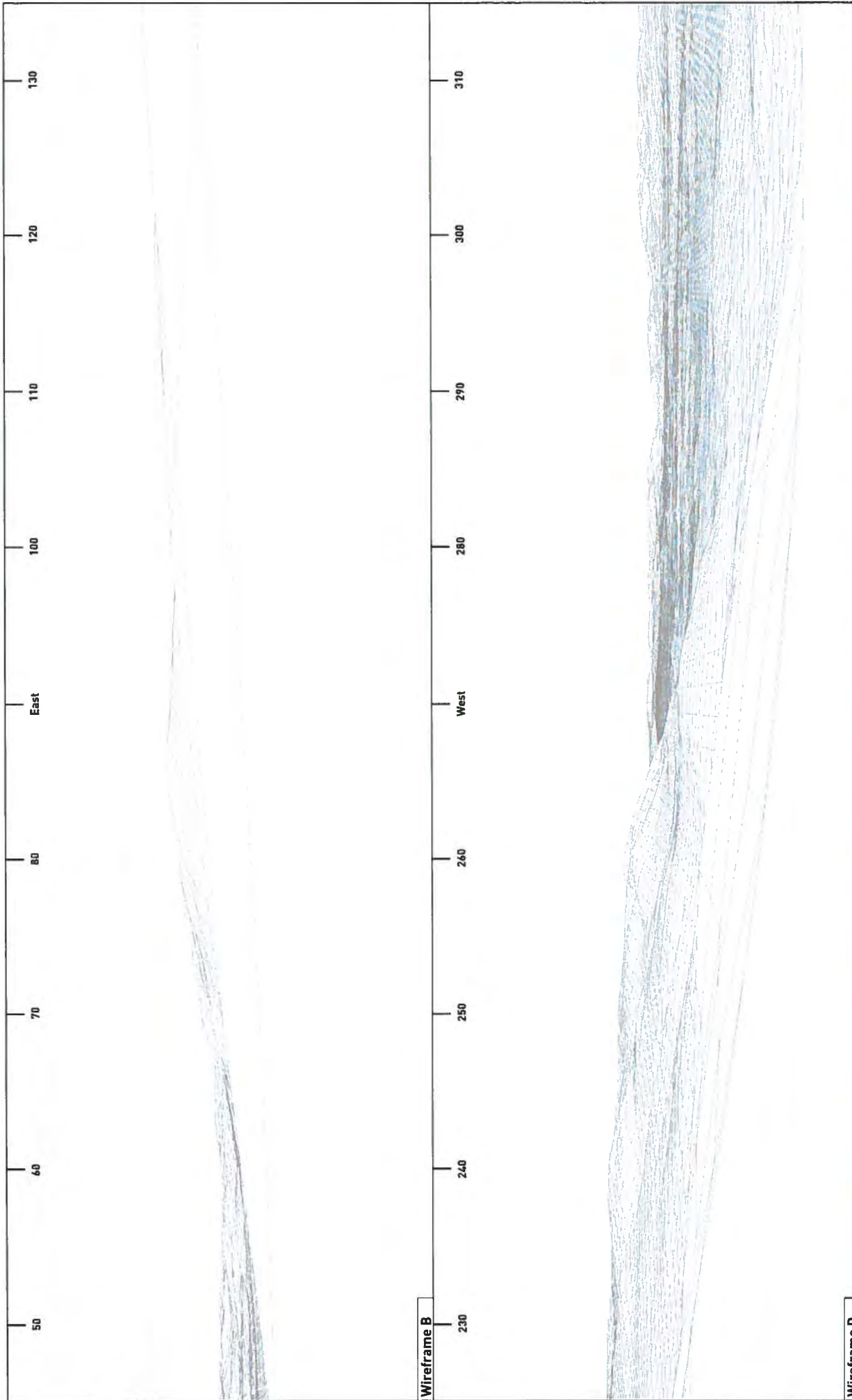


Wireframe C

CLEARWINDS

Pegasus
Environmental
Drumstick Wind Turbine

Cumulative Wireframes
Viewing Distance : 250mm
Date : 21.01.2012
Drawn by : JLB
Checked by : DB



Viewpoint 4
View looking north west from Dunning

Proposed Windfarm
Operational Windfarm
Consented Windfarm

Viewpoint Information

OS Reference: 303376, 713072

Viewpoint height: 209m

Distance to nearest turbine: 15,939m

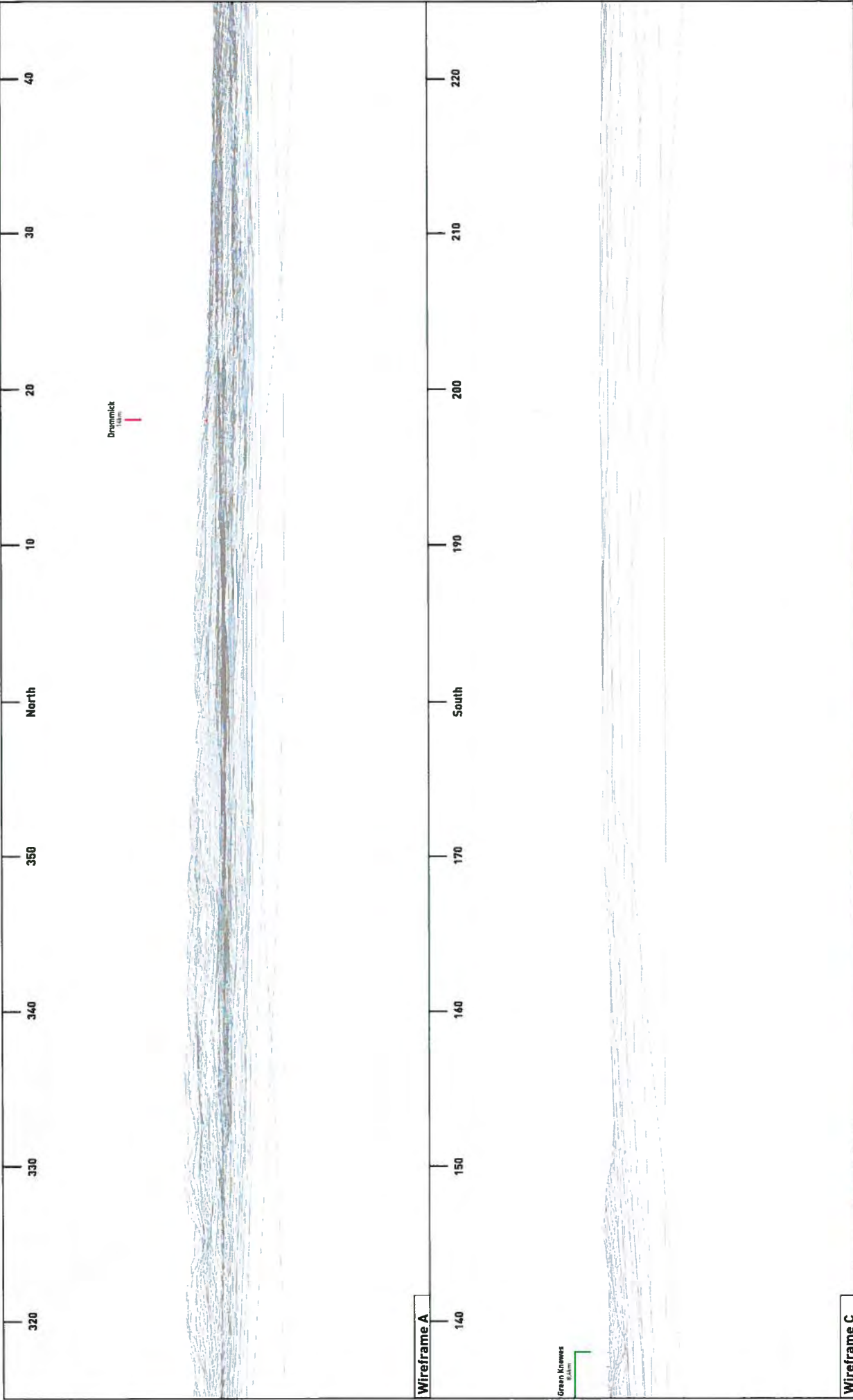
Angle of view: 90 degrees

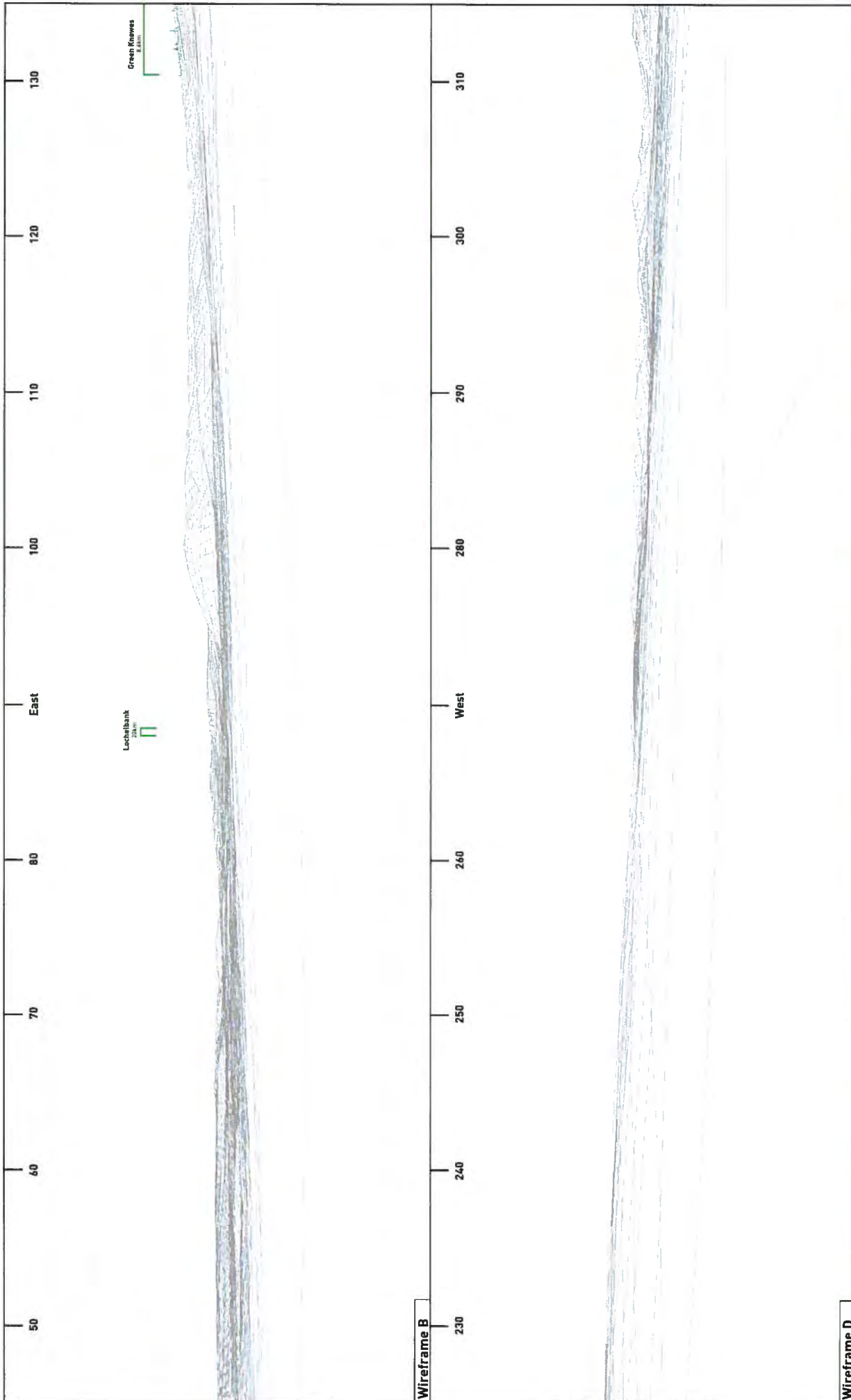
Correct viewing distance : 250mm

Wireframe B

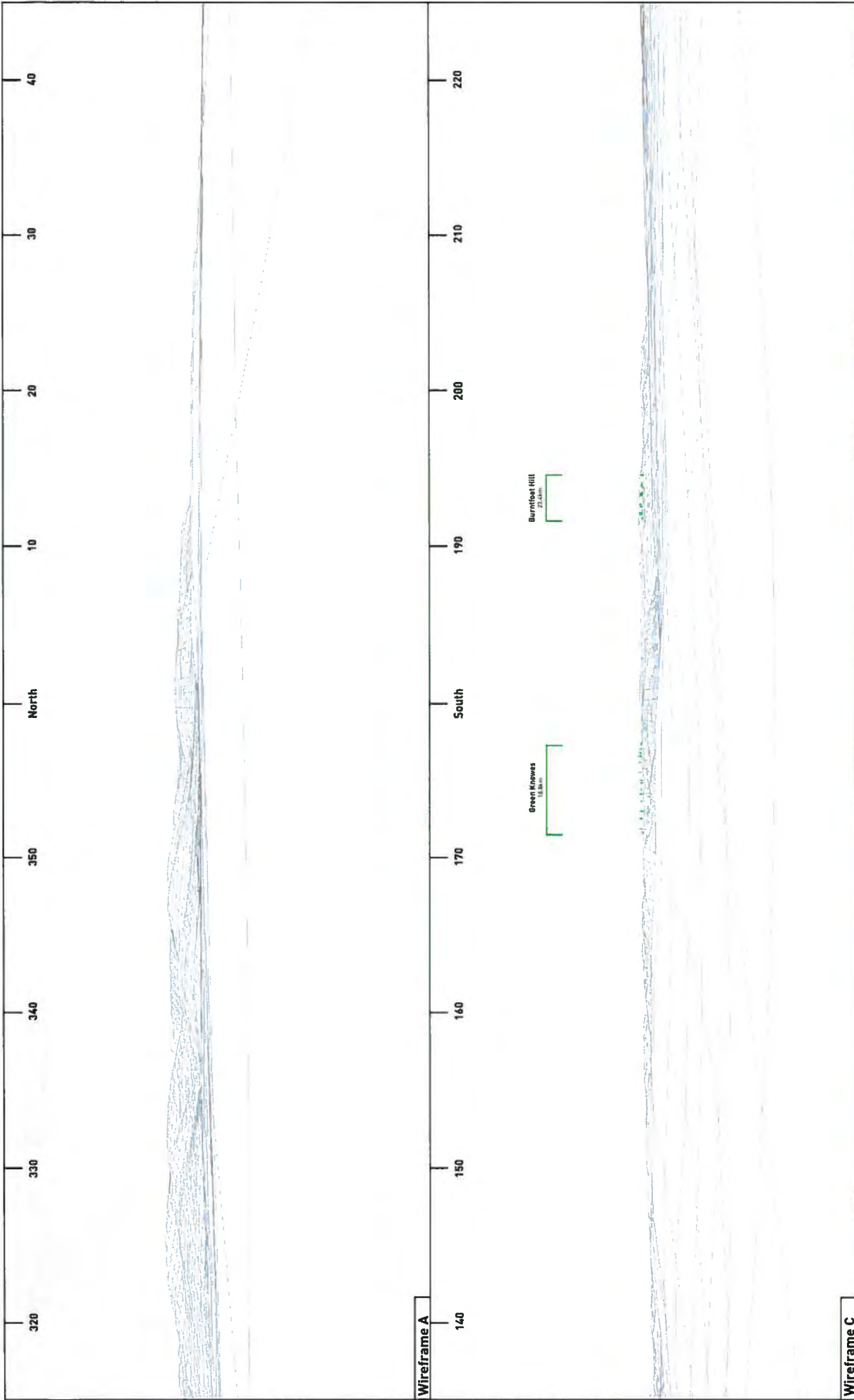
Wireframe D

Pegasus Environmental	
Drumlick Wind Turbine	
Cumulative Wireframes	
Viewing Distance : 250mm	Drawing No. : CDR3_204
Date : 31.01.2012	Drawn by : AD
Checked by : BB	

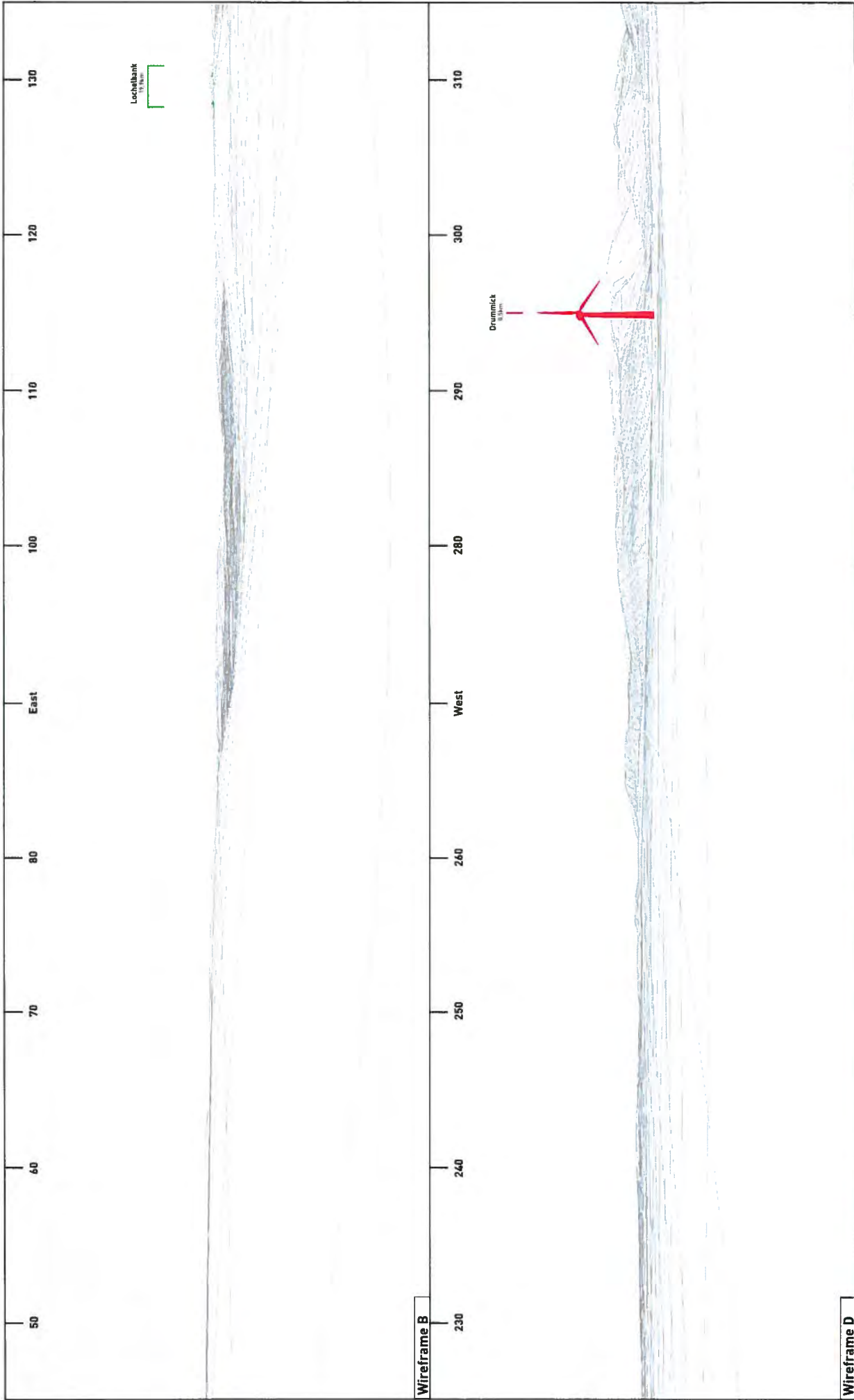




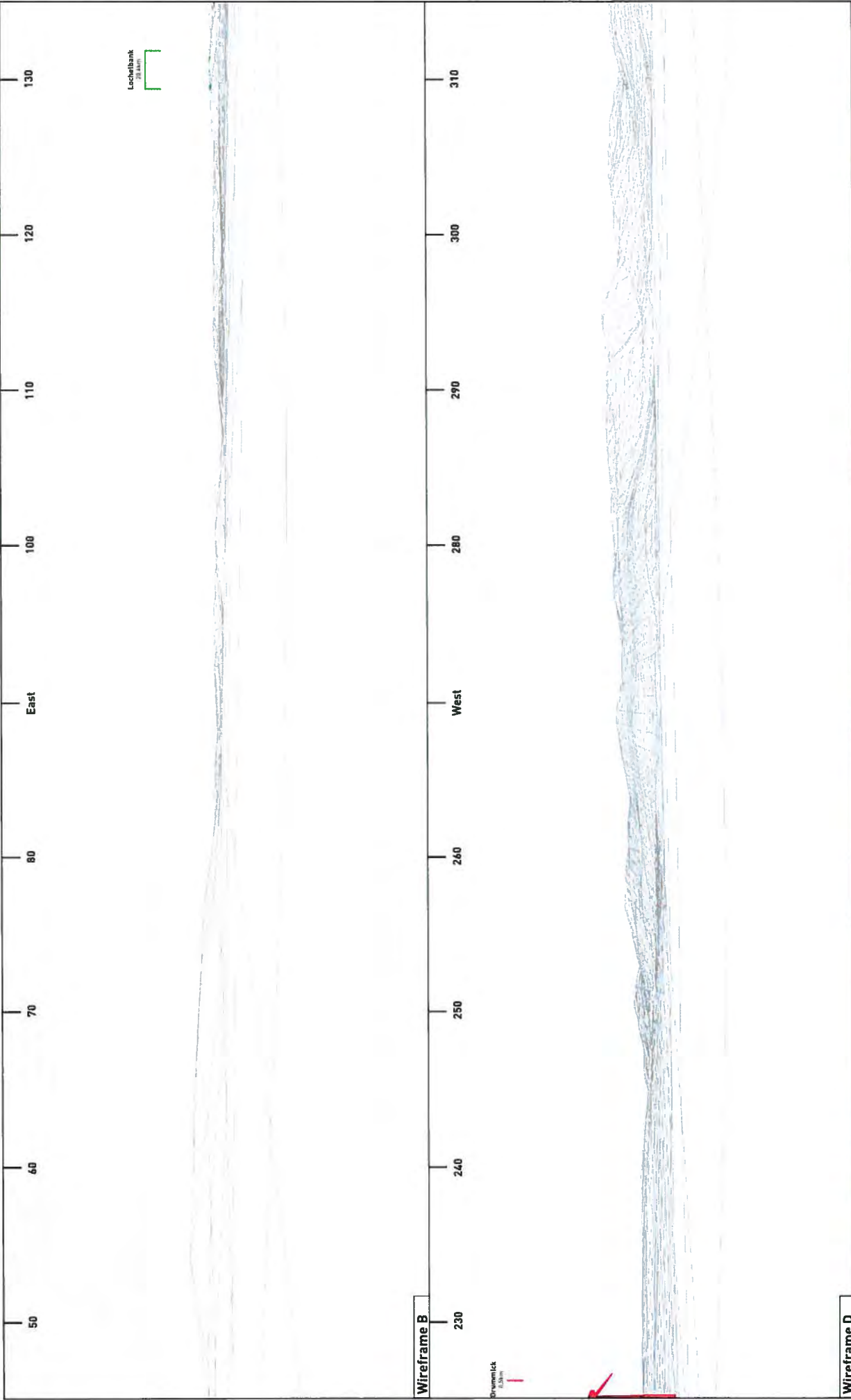
	<p>Viewpoint 6 View looking north, north east from Tullibardine Collegiate Church, Auchterarder</p> <p>■ Proposed Windfarm ■ Operational Windfarm</p>	<p>Viewpoint Information</p> <p>OS Reference: 290972, 713496 Viewpoint height: 106m Distance to nearest turbine: 8455m Green Knowles</p>	<p>Angle of view: 90 degrees Correct viewing distance : 250mm</p>	<p>CLEARWINDS</p> <p>Pegasus Environmental</p> <p>Drumlick Wind Turbine Cumulative Wireframes</p> <p>Viewing Distance : 250mm Date : 23.01.2012 Drawn by : JLB Checked by : JLB</p>
--	---	---	---	--



<p>Viewpoint 8 View looking north west from residential properties at Sluidubh</p> <p> ■ Proposed Windfarm ■ Operational Windfarm ■ Consented Windfarm </p>	<p>Viewpoint Information</p> <p>OS Reference: 295840, 726570</p> <p>Viewpoint height: 197m</p> <p>Distance to nearest turbine: 588m</p>	<p>Angle of view: 90 degrees</p> <p>Correct viewing distance : 250mm</p>	<p>CLEARWINDS</p> <p>Pegasus Environmental Drumstick Wind Turbine</p> <p>Cumulative Wireframes</p> <p>Viewing Distance : 250mm</p> <p>Date : 23.01.2012</p> <p>Drawn by : JAB</p> <p>Checked by : GB</p>
--	--	--	---



	<p>Viewpoint 8 View looking north west from residential properties at Slidubh</p> <p>Proposed Windfarm Operational Windfarm Consented Windfarm</p>	<p>Viewpoint Information</p> <p>OS Reference: 295840, 726570</p> <p>Viewpoint height: 197m</p> <p>Distance to nearest turbine: 588m</p>	<p>CLEANWINDS</p> <p>Pegasus Environmental</p> <p>Drumnick Wind Turbine</p> <p>Cumulative Wireframes</p> <p>Viewing Distance : 250mm</p> <p>Date : 21.01.2012</p> <p>Drawn by : AB</p> <p>Checked by : DB</p>
--	--	--	---



Viewpoint 9
View looking south west from residential properties at Drumnick

Proposed Windfarm
Operational Windfarm
Consented Windfarm

Viewpoint Information
OS Reference: 295675, 727187
Viewpoint height: 210m
Distance to nearest turbine: 521m

Wireframe D

Wireframe D

Scale: 230, 240, 250, 260, 280, 290, 300, 310

North Arrow

Viewpoint Information
OS Reference: 295675, 727187
Viewpoint height: 210m
Distance to nearest turbine: 521m

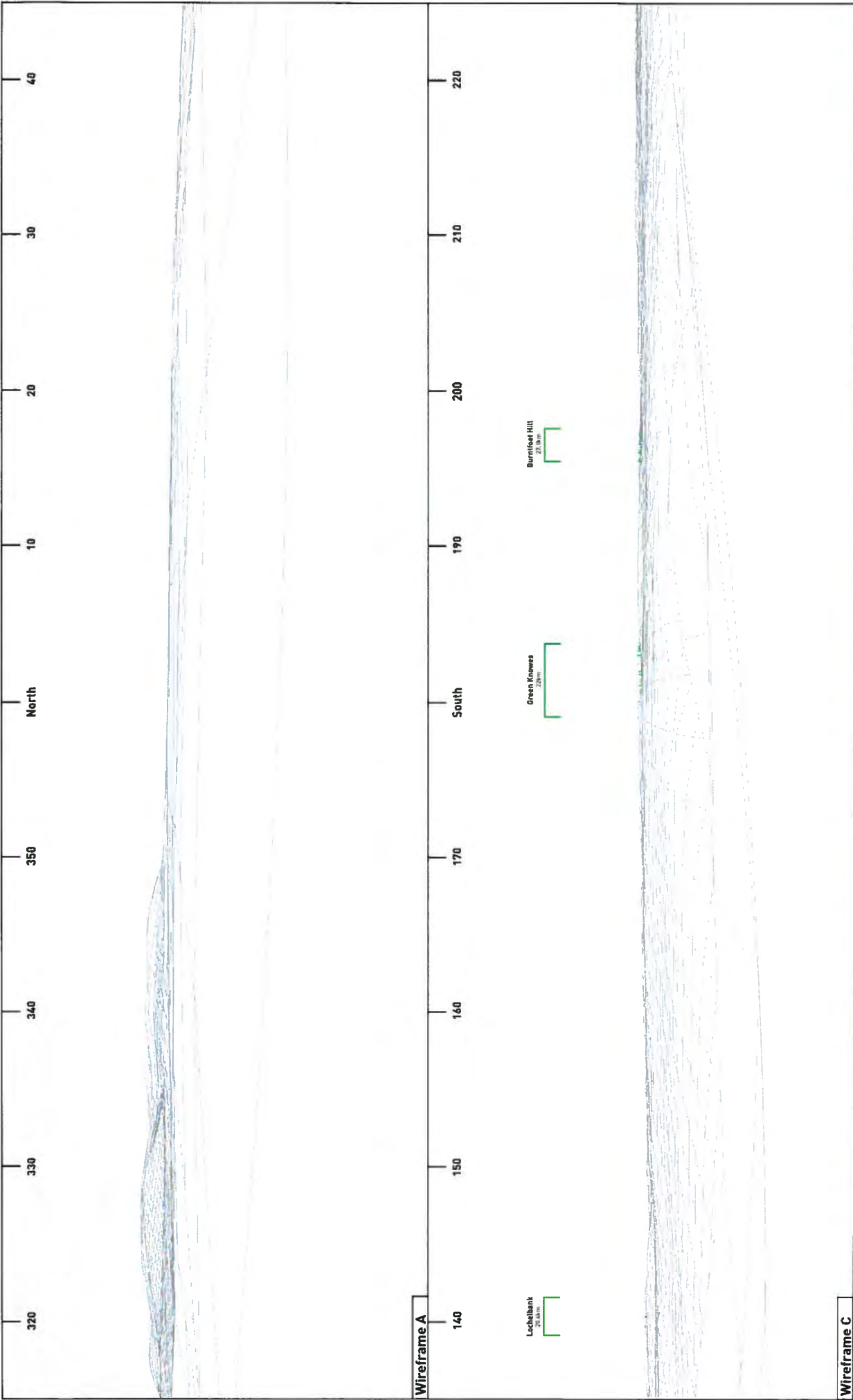
Viewpoint Information
OS Reference: 295675, 727187
Viewpoint height: 210m
Distance to nearest turbine: 521m

Viewpoint 9
View looking south west from residential properties at Drumnick

Proposed Windfarm
Operational Windfarm
Consented Windfarm

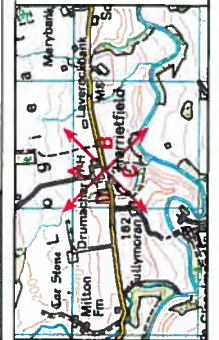
Viewpoint Information
OS Reference: 295675, 727187
Viewpoint height: 210m
Distance to nearest turbine: 521m

CLEARWINDS	
Pegasus Environmental	Drumnick Wind Turbine
Cumulative Wireframes	
Viewing Distance : 250mm	Drawing No. CDRM_20-4
Date : 21.01.2012	Drawn by : AB
Checked by : JDB	



Wireframe A

Wireframe C



Viewpoint 11

View looking south east from residential properties at Harrietfield

- ▮ Proposed Windfarm
- ▮ Operational Windfarm
- ▮ Consented Windfarm

Viewpoint Information

OS Reference: 298273, 729732

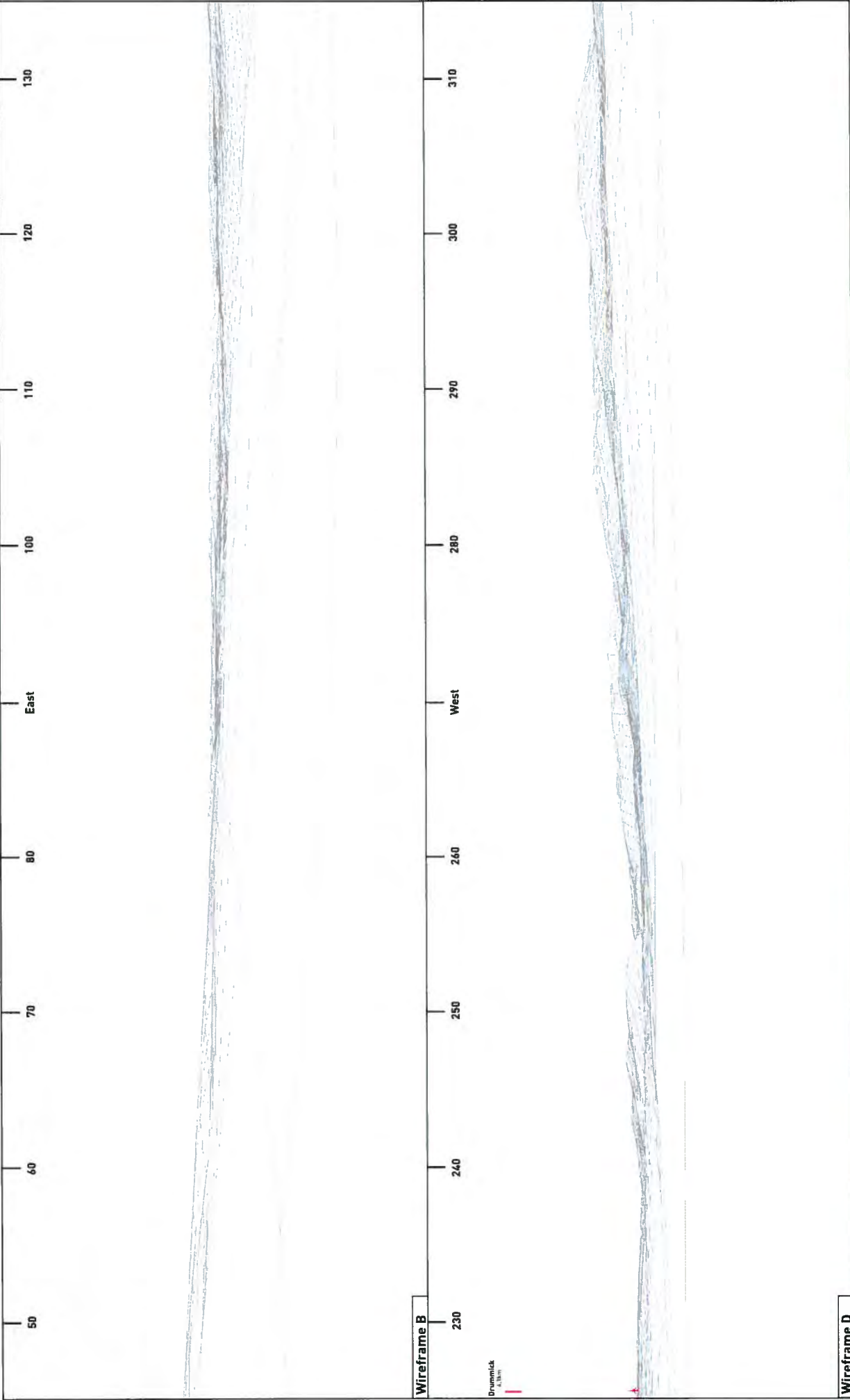
Viewpoint height: 159m

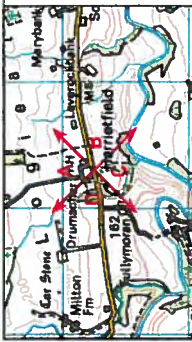
Distance to nearest turbine: 4,158m

Angle of view: 90 degrees

Correct viewing distance : 250mm

CLEARWINDS	
Pegasus	
Brunnicks Wind Turbine	
Cumulative Wireframes	
Viewing Distance : 250mm	Viewing Dist. : 250mm
Date : 21.01.2012	Drawn by : AD
Checked by : SB	





Viewpoint 11
View looking south east from residential properties at Harrietfield

Proposed Windfarm
Operational Windfarm
Consented Windfarm

Viewpoint Information

OS Reference: 298273, 729732

Viewpoint height: 159m

Distance to nearest turbine: 4,158m

Angle of view: 90 degrees

Correct viewing distance : 250mm

Clearwinds

Pegasus
Environmental

Drumick Wind Turbine

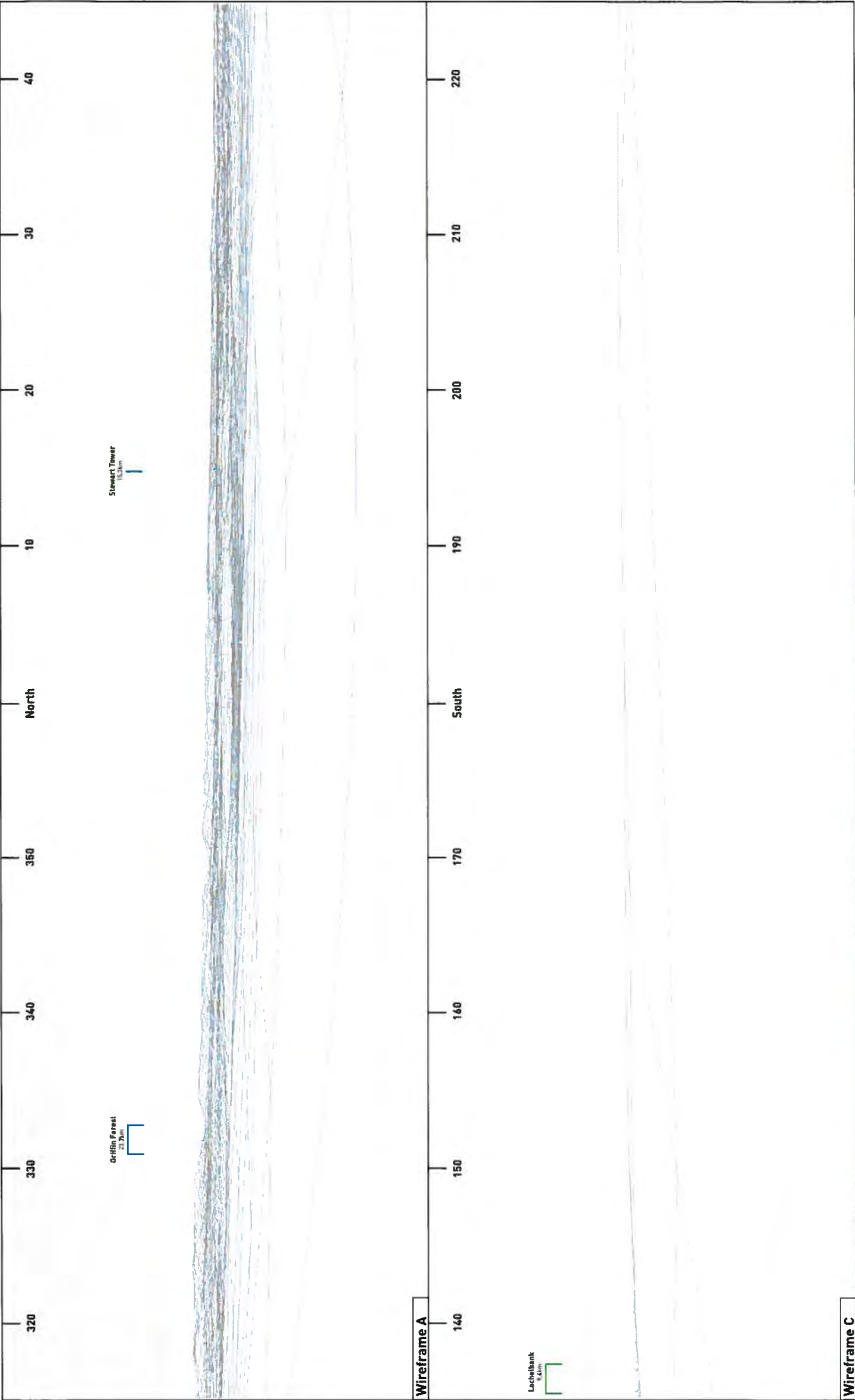
Cumulative Wireframes

Viewing Distance : 250mm

Scale : 1:1,131

Drawn by: AD

Checked by: DB





Viewpoint 12
View looking north west from the access Roman Road to the A9

Proposed Windfarm
Operational Windfarm
Consented Windfarm

Viewpoint Information

OS Reference: 304733, 721029
Viewpoint height: 134m
Distance to nearest turbine: 11,062m

Angle of view: 90 degrees
Correct viewing distance : 250mm

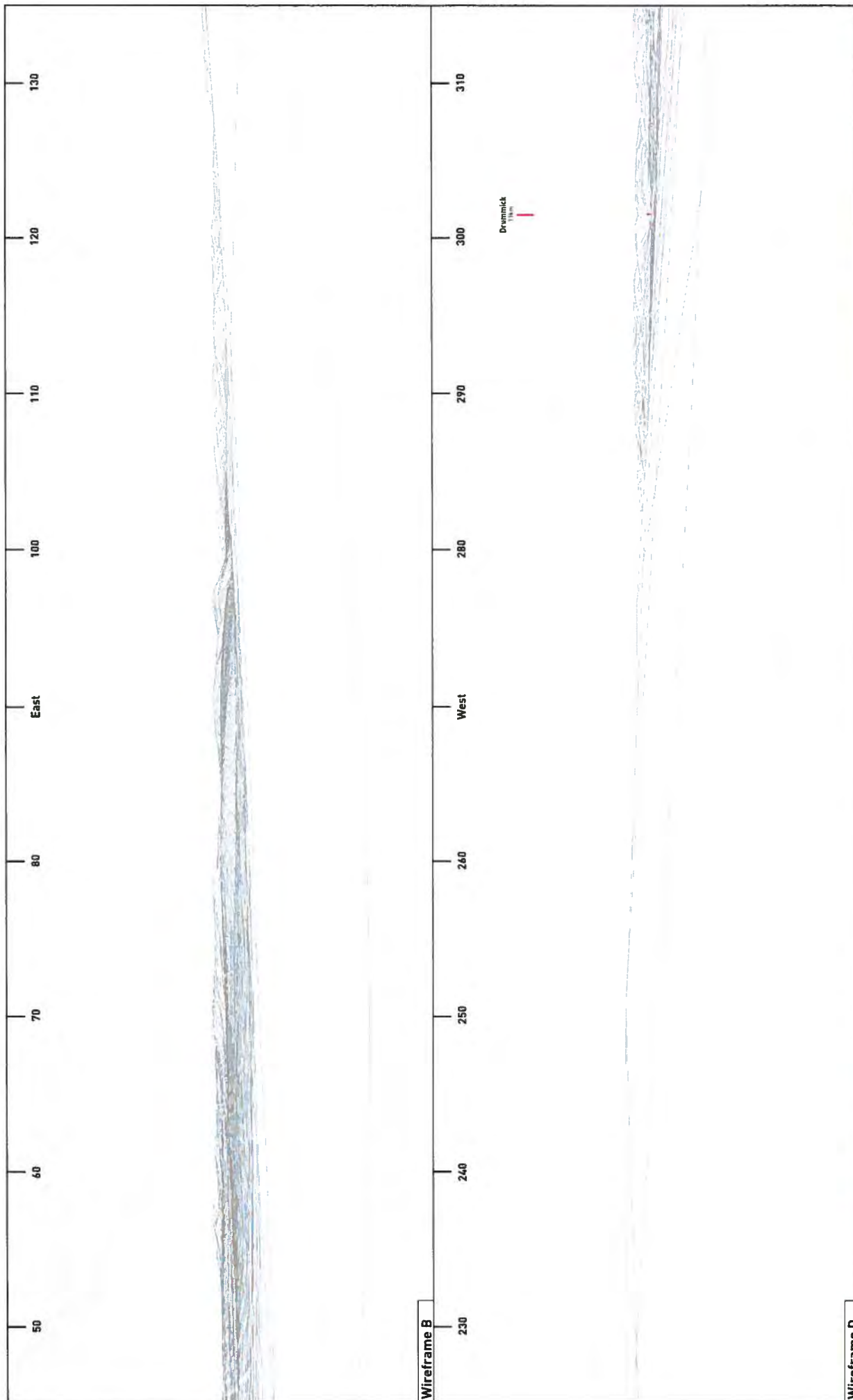
CLEARWINDS

Pegasus
Environmental

Drumnick Wind Turbine

Cumulative Wireframes

Viewing Distance : 250mm	Drawing No. C.0012_20-A
Date : 31.01.2012	Drawn by : AD
Checked by : DB	



Viewpoint 12
View looking north west from the access Roman Road to the A9

Proposed Windfarm
 Operational Windfarm
 Consented Windfarm

Viewpoint Information
OS Reference: 304733, 721029
Viewpoint height: 134m
Distance to nearest turbine: 9665m Lochelbank

Angle of view: 90 degrees
Correct viewing distance : 250mm

Wireframe D

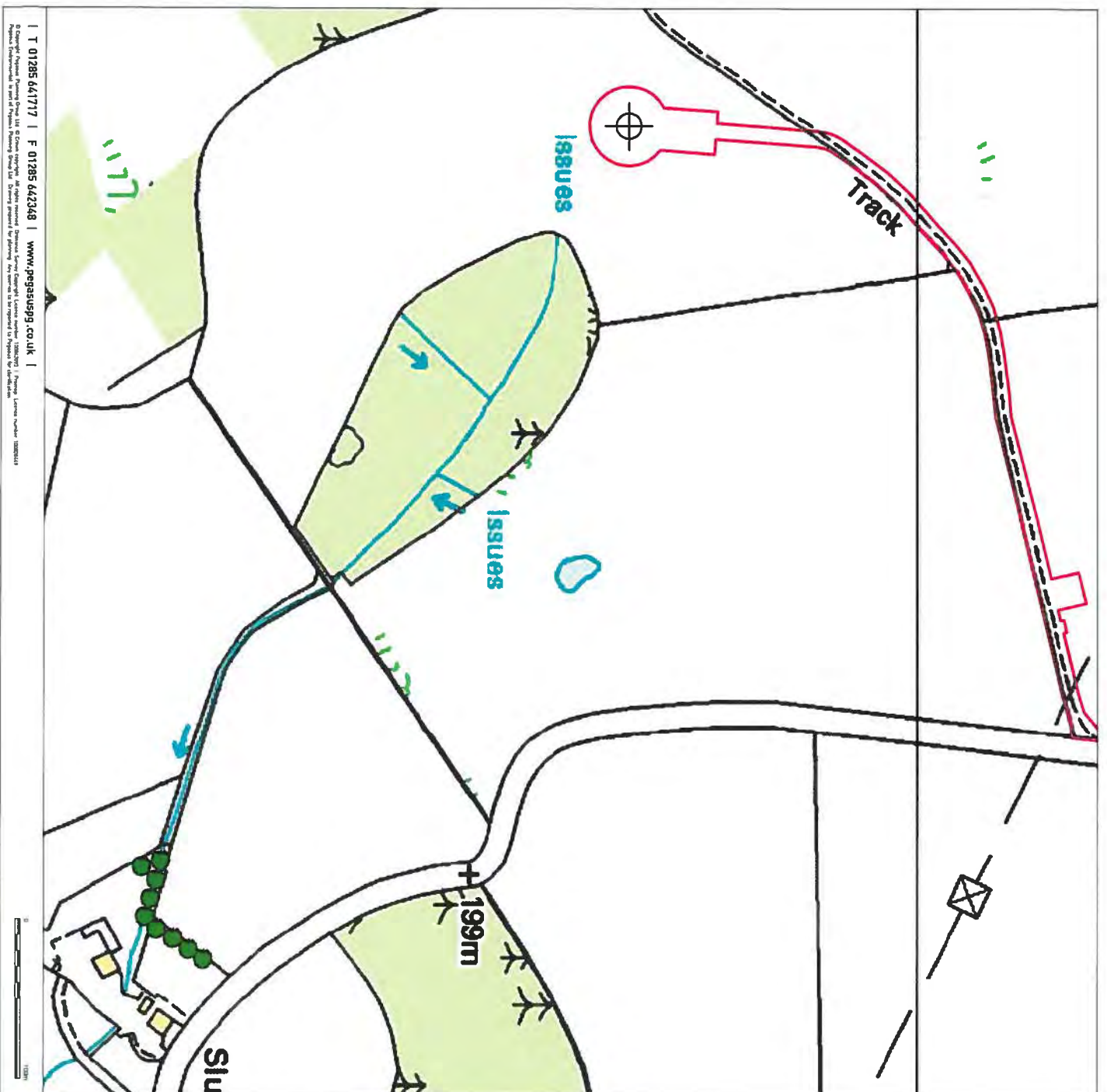
Wireframe B



Wireframe A

CLEARWINDS
Pegasus
Drumtick Wind Turbine
Cumulative Wireframes
Viewing Distance : 250mm
Date : 21.01.2012
Drawing No. CASH_20-4
Drawing by : JLB
Checked by : JLB

APPENDIX H

Landscape Mitigation Plan



KEY	
	Application Boundary
	Proposed Turbine Location 295306, 726818
	Proposed Landscape Planting - native mix of semi mature evergreen and deciduous trees including Scotch Pine, Mountain Ash and Birch

Drummock, Glenalmond	
Landscape Mitigation Plan	
CLEARWINDS	
Drawn by : AD	Checked by : DB
Date : 22.02.12	C.0362_22-A
1 : 2500 @ A3 	



Heritage Desk-Based Assessment

January 2012

Drummick
Glenalmond Wind Turbine
Perthshire
Scotland

Heritage Desk-Based Assessment

CA Project: 3594
CA Report: 11261

prepared by	Nathan Blick, Assistant Research Officer
date	January 2012
checked by	Richard Morton, Consultancy Project Manager
date	January 2012
approved by	Richard Morton, Consultancy Project Manager
signed	
date	January 2012
issue	02

This report is confidential to the client. Cotswold Archaeology accepts no responsibility or liability to any third party to whom this report, or any part of it, is made known. Any such party relies upon this report entirely at their own risk. No part of this report may be reproduced by any means without permission.

© Cotswold Archaeology
Building 11, Kemble Enterprise Park, Kemble, Cirencester, Gloucestershire, GL7 6BQ
t. 01285 771022 f. 01285 771033 e. enquiries@cotswoldarchaeology.co.uk

CONTENTS

1.	INTRODUCTION	4
	<i>Outline</i>	4
	<i>Location and landscape context</i>	4
	<i>Scope</i>	4
2.	METHODOLOGY	5
3.	PLANNING POLICY CONTEXT	8
	<i>Planning policy and guidance context</i>	8
	<i>Scottish Planning Policy (adopted February 2010)</i>	8
	<i>Regional and local planning policy</i>	9
4.	BASELINE SURVEY	11
	<i>Introduction</i>	11
	<i>International designations</i>	11
	<i>National designations</i>	11
	<i>Summary of non-designated or potential heritage assets</i>	12
	<i>Previous archaeological investigations</i>	12
	<i>Geology, palaeoenvironment and topography</i>	12
	<i>Prehistoric (pre AD 43)</i>	13
	<i>Roman (AD43 – AD 410)</i>	14
	<i>Early medieval (5th century AD - 1066) and Medieval (1066 – 1539)</i>	14
	<i>Post-medieval (1540 – 1800) and modern (1801 – present)</i>	15
5.	ANALYSIS	18
	<i>Value of recorded cultural heritage assets</i>	18
	<i>Potential for archaeological remains</i>	18
	<i>Archaeological survival</i>	19
	<i>Potential physical impacts</i>	19
	<i>Potential non-physical (visual) impacts upon the setting of Keillour</i>	
	<i>Castle and Garden</i>	19
	<i>Potential non-physical (visual) impacts upon the setting of Designated</i>	
	<i>cultural heritage assets in the vicinity of the site</i>	22
6.	CONCLUSIONS	25
6.	REFERENCES	25

APPENDIX A: GAZETTEER OF RECORDED HERITAGE ASSETS AND OTHER ELEMENTS OF THE HISTORIC ENVIRONMENT.....	28
---	----

APPENDIX B: BUILDING SURVEY.....	29
----------------------------------	----

LIST OF ILLUSTRATIONS

- Fig. 1 Site location plan
- Fig. 2 Recorded cultural heritage sites and summary development proposals
- Fig. 3 Designated cultural heritage sites in the vicinity of the site and photograph locations
- Fig. 4 Extract from the 1880 Map of Keillour Estate
- Fig. 5 Aerial photograph taken in 1988
- Fig. 6 Remains of a possible shieling in the south-west part of the site
- Fig. 7 View to site from immediately south-east of Keillour Garden
- Fig. 8 View towards the site from immediately east of Keillour Garden
- Fig. 9 View south-east from lane across Keillour Garden towards Strathearn
- Fig. 10 View north-east towards secluded setting of Keillour Castle, from lane to south-west
- Fig. 11 View to site from lane to south-west of Keillour Garden
- Fig. 12 View towards Keillour Garden from lane to east of site
- Fig. 13 View towards Keillour Garden from proposed turbine location
- Fig. 14 View to site from roadside to the west of East Tulchan
- Fig. 15 View to site from roadside to the east of Trinity College Lodge

SUMMARY

Project Name: Drummick, Glenalmond Wind Turbine
Location: Perthshire, Scotland
NGR: NN 95306 26818

In October 2011 Cotswold Archaeology was commissioned by Pegasus Planning Group on behalf of ClearWinds Ltd to carry out a Heritage Desk-Based Assessment of land at Drummick, Glenalmond, Perthshire. The objective of the assessment was to identify the nature and extent of the recorded heritage resource within both the site and its immediate environs and to assess the potential non-physical (visual) impact upon designated cultural heritage assets in the site vicinity.

There are no recorded heritage assets within the site. In the site vicinity, a 19th-century farmstead is recorded at Drummick. Drummick farm house and the former threshing barn are first recorded on the 1868 Ordnance Survey map and are considered to be cultural heritage assets. The remaining buildings at the farm date to the 20th century and are not considered to be heritage assets. The development proposals will have no known physical impact upon the cultural heritage resource.

The requirement for an assessment of the potential visual impact upon the setting of Keillour Castle and Keillour Garden was identified during screening. The visual assessment has identified no potential visual impact upon the setting of the Garden or the Category C(S) Listed Building. Intervening vegetation and rising topography completely screen the development from these historic assets and as such there will be no impact upon their setting.

In summary, there are no recorded heritage assets within the site or its immediate vicinity of such significance as to preclude or influence development. Furthermore, there will be no visual impact upon the setting of Keillour Castle or Keillour Garden.

1. INTRODUCTION

Outline

- 1.1 In October 2011 Cotswold Archaeology was commissioned by Pegasus Planning Group on behalf of ClearWinds Ltd to carry out an archaeological desk-based assessment of land at Drummick, Glenalmond, Perthshire (centred on NGR: NN 95306 26818; Fig. 1). The desk-based assessment supports a planning application for the construction of a single wind turbine within the site.

Location and landscape context

- 1.2 The site is approximately 0.8ha in size, and is located 2km north of the A85 and 1km south of Glenalmond, in the parish of Fowlis Wester, Perthshire (Fig. 1). The site comprises a narrow ribbon of land which extends approximately north-east to south-west across parts of four rough pasture fields. The site was formerly open upland and the current fields within the site were created as a result of 19th and 20th-century enclosure.
- 1.3 The northern boundary of the site extends across open rough pasture and divides the site from further agricultural land. The eastern site boundary is formed by a fence and gateway which divides the site from the single carriage lane which links Glenalmond (1km north of the site) to Keillour (2.3km south-east of the site). The southern boundary of the site is partially formed by a fence line which divides the site from further agricultural land and a small area of plantation. The western boundary extends across open rough pasture.

Scope

- 1.4 The assessment focuses upon the cultural heritage resource of the site itself, although the heritage resource of a minimum 1km 'buffer' around the site has also been assessed in detail, referred to as the 'study area' (Fig. 2).
- 1.5 The main objectives of the desk-based assessment are:
- to identify designated heritage assets within the site and study area;
 - to gather information on non-designated recorded heritage assets;
 - to assess the above baseline information and offer an analysis of the potential for currently unrecorded heritage assets within the site;
 - to assess the significance of the heritage assets; and

- to assess the potential non-physical (visual) impact upon Keillour Castle and Keillour Garden.

2. METHODOLOGY

- 2.1 The methodology is based on the guidance provided in the Institute for Archaeologists standards and guidance for archaeological desk-based assessment (IfA 2008).
- 2.2 This desk-based assessment has considered a minimum 1km buffer study area centred on the site (Fig. 2). The size of the study area ensured that historic mapping and data sources provide sufficient information about the proposed development site and its surrounding landscape from which to assess known and potential impacts on the heritage resource. This in turn provided a clearer indication of the proposed development site's history, context and archaeological potential. All known heritage assets identified within this radius, and close to the perimeter of this study area, have been considered in this assessment.
- 2.3 Known heritage assets within the study area are reported in Section 4. A gazetteer of known and potential heritage assets in the study area has been compiled (Appendix A). All assets are referred to in the text by a unique reference number 01, etc... The locations of these assets can be seen on Figure 2.
- 2.4 Historic environment data was requested in October 2011 from Historic Scotland, Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS), and Perth and Kinross Historic Environment Record (HER). This comprised data on designated cultural heritage sites such as Scheduled Monuments and Listed buildings, non-designated sites comprising archaeological find-spots, sites, investigations, historic buildings, and cartographic and other documentary records.
- 2.5 In addition the following resources were consulted and documents studied:
- Perth and Kinross Archives and Local Studies Library (*visited 3rd November 2011*)
 - The National Collection of Aerial Photography (*accessed online 24 October 2011*)
 - The National Archives of Scotland (*visited 2nd November 2011*)

- Online sources, including DEFRA MAGIC website, Archaeological Data Service (ADS), the Scottish Palaeoecological Archive Database (SPAD), the British Geological Survey (BGS) Geology of Britain Viewer and Local Plan information from the Perth and Kinross Council website.

2.6 A site visit was undertaken on 2 November 2011 to identify any potential cultural heritage sites not recorded by the baseline sources and to more fully understand the potential constraints, if any, to the proposed development.

2.7 Following consultation (screening opinion) with Perth and Kinross Council, the requirement for an assessment of the non-physical (visual) impact of the proposed development upon Keillour Castle Historic Garden and Designed Landscape and Keillour Castle Listed Building was identified. The non-physical (visual) impact assessment was also undertaken on 2 November 2011.

2.8 The draft Historic Scotland setting guidance (*Managing Change in the Historic Environment: Setting*, 2009) recommends a three staged approach to the assessment of potential effects upon the setting of a historic structure (including archaeological features) arising from development. This staged assessment process can be summarised as:

- identify the historic structures that might be affected by a proposed development.
- define the setting by establishing how the surroundings contribute to the ways in which the historic structure is understood, appreciated and experienced. Setting often extends into the broader landscape context and can include less tangible elements, such as function, sensory perceptions or the historical, artistic, literary and scenic associations of places or landscapes. In order to assess the contribution of a historic structure's setting, an examination of what constitutes the current (pre-development) setting of the asset is important. The following questions are key in identifying this contribution:
 - How do the surroundings contribute to our ability to appreciate and understand a historic structure?
 - When the historic structure was developed or in use, was it located to be seen from a distance, perhaps from other sites or buildings?
 - Is there particular intervisibility with other historic structures or landscapes?
 - Was it intended to have wide views over the landscape?

- Is it a prominent or dominant feature in the landscape?
 - Is the historic structure part of a more extensive landscape, or does it form part of a larger group of related assets?
 - Is the setting of the historic structure designed, or has it evolved over time? If so, how have changes over time altered the original or intended setting of the historic structure?
 - Are there particularly important views/vistas?
- assess how any new development would impact upon that setting. The purpose of this is ultimately to inform judgments by stakeholders on questions including: is development of a particular type, scale, massing or prominence within the setting of an asset likely to be acceptable or unacceptable in terms of degree of harm to its significance?; is the precise location of the development likely to be a critical factor in determining whether the degree of harm to the historic structure's setting is acceptable or unacceptable?; and are more detailed aspects of the development's design likely to be a critical factor in determining whether the degree of harm to the historic structure's setting is acceptable or unacceptable? In particular, the assessment should examine the following specific considerations:
 - the visual impact of the proposed development relative to the scale of the historic structure and its setting; in particular, will the local dominance of the historic structure be challenged?
 - the ability of the landscape, which comprises the setting of a historic structure, to absorb new development without eroding its key characteristics;
 - the effect of the proposed development on qualities of the existing setting such as sense of remoteness; evocation of the historical past; sense of place; cultural identity; spiritual responses.
 - the visual impact of the proposed development relative to the current place of the historic structure in the landscape;
 - the presence, extent, character and scale of the existing built environment within the surroundings of the historic structure and how the proposed development compares to this;
 - Potential visibility and proximity of development. Includes consideration of screening/interruption of views by topography, vegetation, and other elements;
 - the magnitude and cumulative effect of the proposed change – sometimes relatively small changes, or a series of small changes,

- can have a major impact on our ability to appreciate and understand a historic structure;
- Number of assets affected (only one, or a group);
- Will particular views/vistas be affected?

3. PLANNING POLICY CONTEXT

Planning policy and guidance context

3.1 The assessment is written within the following legislative, planning policy and guidance context:

- National Heritage Act 1983 (amended 2002)
- Town and Country Planning Act (1990)
- Planning (Listed Buildings and Conservation Areas) Act (1990)
- Scottish Planning Policy (2010)
- Scottish Historic Environment Policy (2009)

Scottish Planning Policy (adopted February 2010)

3.2 In February 2010 the Scottish Government issued 'Scottish Planning Policy' (SPP). The SPP supersedes all previous statements of national planning policy, including SPP 23 – Planning and the Historic Environment (2008).

3.3 The SPP sets out the Scottish Government's policy on the protection, conservation and enhancement of the historic environment and the role of the planning system. The SPP states that the historic environment includes ancient monuments, archaeological sites and landscapes, historic buildings, townscapes, parks, gardens and designed landscapes and other features. Non-designated sites, as well as designated sites, are considered by the SPP as an important element of Scotland's heritage which contribute to national identity.

3.4 The SPP makes reference to the need to take into account Historic Scotland policy in the determination of applications affecting the historic environment; which include Scottish Historic Environment Policy (SHEP) and the 'Managing Change in the Historic Environment' guidance note series.

- 3.5 In relation to the potential impacts of development upon the historic environment, paragraph 111 of SPP notes that;

In most cases, the historic environment (excluding archaeology) can accommodate change which is informed and sensitively managed, and can be adapted to accommodate new uses whilst retaining its special character. However, in some cases the importance of the heritage asset is such that change may be difficult or may not be possible. Decisions should be based on a clear understanding of the importance of the heritage assets.

- 3.6 The amount of information required on the importance of heritage assets that may be affected by a proposed development should be proportionate to the likely impact of development. Paragraph 112 of SSP states that;

When significant elements of the historic environment are likely to be affected by development proposals, developers should take the preservation of this significance into account in their proposals. The amount of information and analysis required should relate in scale to the possible impact on the historic environment.

- 3.7 In relation to archaeology specifically, SPP states;

Archaeological sites and monuments are an important, finite and non-renewable resource and should be protected and preserved in situ wherever feasible. The presence and potential presence of archaeological assets should be considered by planning authorities when allocating sites in the development plan and when making decisions on planning applications. Where preservation in-situ is not possible planning authorities should, through the use of conditions or a legal agreement, ensure that developers undertake appropriate excavation, recording, analysis, publication and archiving before and/or during development. If archaeological discoveries are made during any development, a professional archaeologist should be given access to inspect and record them.

Regional and local planning policy

- 3.8 Local policy is contained within the Perth and Kinross Structure Plan (adopted June 2003). Policy relating to the archaeological resource is contained within 'Environment and Resources Policy 8', which states;

The Council will seek to ensure that the rich and varied cultural heritage resources of Perth and Kinross are recognised, recorded, protected and enhanced as appropriate. New development which would adversely affect Listed Buildings, Conservation Areas, Scheduled Ancient Monuments, Historic Gardens and Designed Landscapes or their settings will not be permitted unless there is a proven public interest where social, economic or safety considerations outweighs the cultural interest in the site. The same protection will be afforded to sites proposed for designation. Other important archaeological sites or landscapes will also be protected from inappropriate development. Local Plans will bring forward policies for their protection and enhancement.

- 3.9 Further local policy is contained within the Strathearn Area Local Plan (adopted May 2001). Policy relating to the archaeological resource is included within Policies 23, 24 and 25, which state:

Policy 23

The Council will safeguard the settings and archaeological landscapes associated with Scheduled Ancient Monuments (protected under the Ancient Monuments and Archaeological Areas Act 1979), from potential adverse development.

Policy 24

The Council will seek to protect unscheduled sites of archaeological significance and their settings. Where development is proposed in such areas, there will be strong presumption in favour of preservation in situ. Where, in exceptional circumstances, preservation of the archaeological features is not feasible, the developer, if necessary through appropriate conditions attached to planning consents, will be required to make provision for the excavation and recording of threatened features prior to development commencing.

Policy 25

Where it is likely that archaeological remains may exist, the prospective developer will be required to arrange for an archaeological evaluation to be carried out by a professionally qualified archaeological organisation or archaeologist before the planning application is determined.

4. BASELINE SURVEY

Introduction

- 4.1 This section provides an overview of the historical and archaeological background of the study area, in order to provide a better understanding of the context and significance of the cultural heritage resource that may be affected by development. This assessment then determines the significance of any affected cultural heritage sites (Section 5 of this report) and the potential for encountering buried archaeological remains within the proposed development site and their likely nature, extent and condition.

Designated sites

International designations

- 4.2 No World Heritage Sites or sites included on the Tentative List of Future Nominations for World Heritage Sites (July 2010) are situated within the site or its vicinity.

National designations

- 4.3 There are no Scheduled Monuments located within the site or study area. The nearest Scheduled Monuments to the site are the Seat Knowe cairn (HS: Scheduled Monument 7525) approximately 2.7km south-west of the site and the Roman fort at Fendoch Burn (HS: Scheduled Monument 1603) approximately 3.4km north-west of the site.
- 4.4 No Category 'A' or 'B' Listed Buildings are recorded within the site or study area. A single 'C(S)' Listed Building, the 19th-century West Tulchan Farmhouse (Fig. 2, 1), is located approximately 1.2km north of the site.
- 4.5 No Inventory Garden and Designed Landscapes, or Historic Battlefields, are recorded within the site or study area. There are no Conservation Areas recorded within the site or the study area.
- 4.6 In the wider landscape, the Inventory Garden at Keillour and the Grade C(S) Listed Keillour Castle are located approximately 2.2km to the south-east of the site (see Fig. 3).

Summary of non-designated or potential heritage assets

- 4.7 There are no recorded heritage assets within the site and the potential for currently unrecorded archaeological remains to occur within the site is considered to be low. The southern part of the site comprises an area of lower, marshy ground and there is some potential for peat deposits to occur in this part of the site. Deposits of palaeoenvironmental significance can potentially survive within peat, although no such deposits have previously been recorded within the site or the study area.
- 4.8 A farmstead is first recorded at Drummick, 60m north of the site, on the First Edition Ordnance Survey map (Fig. 2, 6). Two 19th-century buildings (Fig. 2 inset, **A** and **B**) survive at Drummick and are considered to be cultural heritage assets of historic and architectural value.

Previous archaeological investigations

- 4.9 There have been no recorded previous archaeological investigations within the site. Wider landscape studies, such as the Roman Gask project (Woolliscroft and Hoffmann 2010), include the study area but do not relate to the site area specifically.

Geology, palaeoenvironment and topography

- 4.10 The solid geology within the site comprises undifferentiated sandstone, siltstone and mudstone of the Arbuthnott-Garvock Group and Strathmore Group (BGS 2011). The superficial deposits within the site have not been mapped, although areas of marsh are recorded across the site on historic cartographic sources (and during the site visit) and could be indicative of currently unrecorded peat deposits.
- 4.11 There are no alluvial or peat deposits recorded within the site, and there are no recorded previous palaeoecological studies in the study area (SPA database; accessed October 2011). Extensive marshy areas were recorded in the site vicinity (typically below the 200m contour), particularly in the vicinity of a tributary of the Keillour Burn, and may contain peat deposits. As such it is considered possible, although unlikely, that palaeoenvironmental remains occur within the site.
- 4.12 The site is located on ground which slopes to the south and west, towards the lower marshy ground north of a small area of plantation. The central and northern part of the site occupies an area of higher ground (located at approximately 210m AOD) which is currently utilised by an existing farm track. Drummick Farm is located upon further high ground (220m AOD) approximately 60m north-east of the site, and the

prefix 'Drum' is likely to relate to the farm's ridgeline setting (Darton 1990, 104). The lower ground to the north-west and south of this ridge (at approximately 190m AOD) is particularly waterlogged and predominantly comprises marshy pasture.

- 4.13 A small stream/field ditch is recorded within the southern part of the site crossing the lower area of marshland and flowing towards the small area of plantation approximately 50m south-east of the site. Further nearby watercourses comprise the Buchanty Burn 850m north-west of the site and the Campsie Burn 540m north-east of the site.

- 4.14 The setting of the site is dominated by the highland hill range approximately 6km north of the site, which includes Maell Rearnhar (667m AOD) and Maell Tarsuinn (647m AOD). These form a visually imposing backdrop to the north of the site, with the site itself located on a shoulder of land to the south of the highlands and north of the Strathearn plain. Views to the east, south and west from the site are largely limited by plantation in the site vicinity, although a distant hill range (the Common of Dunning) is visible on the horizon approximately 16km south of the site.

Prehistoric (pre AD 43)

- 4.15 The prehistoric ceremonial landscape of Perthshire has been well studied (RCAHMS 1994), and the find spots of a cylindrical pounder and Neolithic carved stone ball, recorded 950m north of the site (Fig. 2, 2) and a Neolithic claystone axe, recorded 840m south-west of the site (Fig. 2, 3), are indicative of Neolithic activity in the site vicinity. No prehistoric structural features, however, have been recorded within the study area.
- 4.16 The study area falls within the territory of a late prehistoric tribe known as the *Venicones* (Cunliffe 2005, 218). The lowlands to the south and east of the site (in the vicinity of modern-day Perth) have been identified as a particular focus of prehistoric settlement (RCAHMS 1994, 41) due to the fertile agricultural land ('Streaths'; Strachan 2011, 5) of this region. The site, however, was located on the uplands to the north-west of the fertile river plain and is likely to have comprised relatively marginal agricultural land at this time.
- 4.17 The natural rock outcrop 770m west of the site (Fig. 2, 14) has previously been recorded as a 'fort' and a 'cairn' by historic Ordnance Survey maps, but has recently been interpreted as a natural feature (PKHER: MPK1494).

Roman (AD43 – AD 410)

- 4.18 The Roman invasion had a profound effect upon the landscape of Perthshire, and the earliest Roman frontier in northern Britain, the Gask Ridge Frontier (Breeze 1982, 62), was established in the AD70s approximately 25km to the south of the site, close to the modern alignment of the A9. As such the site was located beyond this early Roman frontier, and the Roman fort at Fendoch, 3.4km north-west of the site at the mouth of Sma' Glen, was one of a number of forts which collectively formed the 'Highland Line' to the north of the Gask Frontier defences (Woolliscroft and Hoffmann 2006 and 2010). These forts were designed to command access into and out of the Highland glens (Strachan 2011, 5), and were initially constructed to serve as 'springboards' for a planned military campaign further north into the highlands. This frontier, however, did not last beyond the 2nd century AD, and the limits of Rome were thereafter set further to the south at the Antonine Wall and Hadrian's Wall.
- 4.19 There are no recorded Roman features within the site or study area, and the site itself is likely to have formed part of a much wider area of upland pasture overlooking the sheltered valleys to the north (Glenalmond) and south (Keillour).

Early medieval (5th century AD - 1066) and Medieval (1066 – 1539)

- 4.20 There are no recorded early medieval features within the site or study area. The site was located within Pictish territory (a term first used by the Roman's to describe the communities north of Hadrian's Wall), within the province of 'Fortriu' (RCAHMS 1994, 88). The site is likely to have remained unchanged from its late prehistoric and Roman use.
- 4.21 In the wider landscape, Perth (approximately 14km east of the site) developed as a prominent medieval town, and was granted burgh status in the early 12th century (Strachan 2011). The town was one of the richest trading burghs during the medieval period, primarily because of its strategic position on the eastern seaboard of Scotland, with the River Tay providing access both eastwards to the coast and north into the highlands.
- 4.22 The site, however, is likely to have remained an area of relatively under-utilised upland pasture during the medieval period, most likely forming part of the low-intensity pasture land in the hinterland of the medieval settlement at Keillour (approximately 2.3km south-east of the site). Settlement is first recorded at Keillour

in the 13th-century, although the current Keillour Castle dates to the late 19th century.

Post-medieval (1540 – 1800) and modern (1801 – present)

- 4.23 The earliest cartographic source to record the site is the 1746 Map of the Country around Perth (not illustrated). Settlements are recorded at Keillour and Buchanty, although the site is depicted as part of a stylised range of hills, and there is no record of a settlement at Drummick. Roy's Military survey of Scotland (1747-1755; not illustrated) also recorded the site as an area of upland. The only settlement recorded in the vicinity of the site on this source is 'Upper Tulchan'.
- 4.24 The Roy Map was part of a broader strategy to open up the Highlands following the English victory at Culloden, in parallel with the construction of an extensive road network, connecting newly built forts and repaired military strongholds (NLS 2011). The subsequent clearances largely took place between the 1770s and 1850s in a bid to increase agricultural productivity on economically marginal land in the highlands of Scotland and to overturn the old militaristic clan-based system (Devine 2006). The site is located to the south of the main body of the highlands and there is no recorded evidence of the clearance process within the study area.
- 4.25 The possible remains of a small, undated, structure were recorded 220m south of the site (Fig. 2, 15; Fig. 6). This feature was overgrown and waterlogged, although appears to comprise a rectangular stone-built structure approximately 10m x 3m (Fig. 6). It is possible that this feature is a sheiling, a post-medieval shepherd hut used during the transhumance of livestock and commonly found near to streams. It is also possible, however, that this feature relates to a derelict sheepfold or a stone extraction site. A further small stone structure constructed adjacent to a field boundary 100m west of the site is likely to have formerly served as a sheep shelter, although currently survives as an overgrown stretch of dry-stone walling (not illustrated).
- 4.26 Stobie's 1783 Map of Perthshire (not illustrated) recorded settlements at 'Upper Tulchan' and 'Drummuck', which had presumably been newly established between 1755 (Roy's Military Survey) and 1783. This is the first cartographic source to record Drummick settlement and indicates that the current farmstead is likely to have post-medieval antecedence. Structural elements of Drummick Farmhouse (Fig. 2, inset A; Appendix B, A) may conceivably date to this period.

- 4.27 The local place names in the site vicinity provide an indication of the surrounding topography and landscape of the post-medieval and modern period. Drummick Farm in the central part of the site is first recorded on Stobie's 1783 Map of Perthshire (not illustrated) and probably derives its name from 'Druim', meaning 'ridge' (Darton 1990, 104). To the south of the site, the settlement at Sluidubh is likely to derive its name from 'Sliabh', meaning 'mountain or hill face' and 'dubh' meaning 'black/dark' (Darton 1990, 105 and 248). These placenames are obviously closely linked to the topographical setting of the site, which straddles the ridge line north of Gorthy Wood.
- 4.28 A pair of probably 19th-century brick air shafts are recorded at Loch Horn 1.5km south-east of the site (Fig.2, 12). These two shafts were recorded during forestry operations in 2002 on the northern edge of Loch Horn. The Loch dates to the late 19th century although the shafts are not depicted on historic maps or modern maps. The function of the shafts is uncertain, although was presumably to control air or water flow.
- 4.29 The 1868 First Edition Ordnance Survey map (not illustrated) and the 1880 Map of the Keillour Estate (Fig. 4) recorded the eastern part of the site as an area of open upland, while the western part of the site extended into an area of plantation (part of Gorthy Wood). The southern part of the site extended towards an area of marshland and a stream head that flowed into the Keillour Burn approximately 720m south-east of the site.
- 4.30 Buildings are recorded at Drummick Farm to the east of the small lane 60m north-east of the site (see Fig. 2, 6; and inset **A** and **B**), including the extant farmhouse and barn and a horse engine house (no longer extant). A horse engine house was commonly found on farms next to the threshing barn, where it was used to power the machinery. A small farmstead, comprising an unroofed L-shaped building and an enclosure associated with a well and a quarry, is recorded close to Gorthy Wood approximately 360m west of the site (Fig. 2, 7). This settlement was removed by a small quarry recorded on the subsequent Ordnance Survey map. The 1868 map also recorded a small, narrow quarry within agricultural land 240m east of the site (see Fig. 4). This feature was labelled as 'old quarry' and had therefore passed out of use by 1868.

- 4.31 The First Edition Ordnance Survey map also recorded a further small farmstead 450m west of the site (Fig. 2, **8**), comprising a cottage, an enclosure and a well at South Tulchan, and a further farmstead and horse engine house 600m to the south of the site at Sluidubh (Fig. 2, **9**). A sheep fold was recorded 540m east of the site (Fig. 2, **4**). Four further farmsteads were recorded in the wider study area on this source, including former farmsteads at New Drummick (Fig. 2, **10**) and Den of Keillour (Fig. 2, **11**), as well as the extant farmstead at South Buchanty (Fig. 2, **13**) and the Grade C(S) Listed West Tulchan 1.2km to the north of the site (Fig. 2, **1**).
- 4.32 The 1880 Map of the Keillour Estate (Fig. 4) depicted the site as part of the Keillour Estate. The site formed part of the land belonging to the farm at Drummick (defined by a red boundary) while the areas of plantation within the site belonged to the Keillour Estate directly (defined by a green boundary).
- 4.33 The 1901 Ordnance Survey map (not illustrated) recorded the removal of the farmstead at Gorthy Wood (Fig. 2, **7**), which had been destroyed by a small quarry at this date. A further new feature recorded by this source was a small sheepfold adjacent to a field boundary 40m west of the site (see Fig. 4). By this date the eastern part of the site area had been sub-divided into small field enclosures.
- 4.34 The 1958 Ordnance Survey map (not illustrated) recorded the removal of the area of plantation in the western part of the site, the former boundary of which survived as a field boundary. The quarry at Gorthy Wood was labelled as 'old quarry' at this date indicating that it had passed out of use.
- 4.35 Ordnance Survey mapping from 1969 (not illustrated) recorded several new structures at Drummick 60m north-west of the site. These comprised Drummick Bungalow (Fig. 2, **G**), two agricultural buildings (Fig. 2, **D** and **E**), a small outbuilding in a field north of the farmstead (Fig. 2, **H**) and small additions to Drummick Farmhouse (Fig. 2, **A**). The 1978 Ordnance Survey map (not illustrated) recorded the removal of a field boundary which extended into the central part of the site, and the addition of a further field boundary across the southern part of the site.
- 4.36 Aerial photography from 1988 (Fig. 5) recorded the removal of the field boundary in the southern part of the site, as well as areas of disturbance adjacent to the lane through the central part of the site. The possible shieling identified during the site

visit is also visible on this source (see Fig. 5). Two large sheds (Fig. 2, **C** and **F**) to the north of Drummick Farmhouse were also first recorded on this source.

5. ANALYSIS

Value of recorded heritage assets

- 5.1 There are no recorded heritage assets within the site and the potential for currently unrecorded archaeological remains is considered to be low.
- 5.2 Drummick farmstead (Fig. 2, **6**), approximately 60m north-east of the site, comprises a farmhouse, a number of agricultural buildings, and a modern bungalow. The Farmhouse (Fig. 2, **A**) and an associated barn (Fig. 2, **B**) are first recorded on the First Edition Ordnance Survey map and appear to survive relatively intact (see Appendix B). These are considered to be heritage assets of some historic value. The remaining buildings recorded at Drummick date to the later half of the 20th century and are not considered to be heritage sites (Fig. 2, **C, D, E, F, G, and H**).

Potential for archaeological remains

- 5.3 Prehistoric lithics have been identified as surface finds from the wider study area and are indicative of prehistoric activity in the vicinity of the site. However, no below ground prehistoric remains have been recorded within the study area and the potential for prehistoric archaeological remains to occur within the site is considered to be low.
- 5.4 The site is located beyond the Roman Gask Frontier, although a fort is recorded at Fendoch. The potential for Roman archaeological remains to occur within the site is considered to be very low.
- 5.5 The site is likely to have formed part of a much wider area of upland rough pasture during the early medieval and medieval periods. As such the potential for archaeological remains relating to these periods is also considered to be low.
- 5.6 There are no recorded post-medieval features within the study area, although the possible shieling to the south-west of the site may relate to post-medieval agricultural activity. The potential for unrecorded post-medieval archaeological remains to occur within the site is considered to be low. Modern agricultural features

are recorded in the vicinity of the site, and there is some potential for similar unrecorded features within the site. Any such remains are unlikely to be of archaeological significance.

- 5.7 The areas of marsh within the southern part of the site may relate to previously unrecorded areas of peat. Any peat deposits within the site may have the potential to contain deposits of palaeoenvironmental and archaeological significance. No such deposits, however, have been recorded within the site or the wider study area.

Archaeological survival

- 5.8 Areas of plantation have been recorded on historic cartographic sources in the western part of the site. It is possible that any potential archaeological deposits in the vicinity of these former plantations would have been impacted upon by tree roots.

Potential physical impacts

- 5.9 The development proposals are illustrated on Fig. 2 and summarised below. The development proposal comprises the erection of a single wind turbine, with a maximum tip height of 77m and a hub height of 50m. Underground cabling will link the turbine to the on-site substation in the eastern part of the site. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time, although to minimise ground disturbance cables will be laid adjacent to the access tracks as shown on Fig. 2. To facilitate construction of the turbine a crane pad is required immediately to the north of the turbine location, while a construction compound is proposed in the eastern part of the site.

- 5.10 On current information there are no identified physical impacts upon the cultural heritage resource.

Potential non-physical (visual) impacts upon the setting of Keillour Castle and Garden

- 5.11 The recommendation for an assessment of the potential non-physical (visual) impact upon the setting of Keillour Castle and Garden was identified in the screening opinion provided by Perth and Kinross Council. The potential impacts of the proposed development upon the setting of the Inventory Garden and the Category C(S) Listed Keillour House were assessed from publicly accessible land. Photographic views are referenced throughout the discussion below and are

included as Figs. 6-15. The location and orientation of these photographic views are depicted on Fig. 3.

Keillour Garden

- 5.12 Keillour Garden is a designated cultural heritage asset located approximately 2.2km south-east of the site (Fig. 3), located at the convergence of the Keillour Burn and the Horn Burn. Keillour Garden comprises 12ha of garden, walled garden and parkland established by Major and Mrs George Knox Finlay from 1938 onwards, on the site of earlier 19th-century gardens and parkland. The Grade C(S) Listed Keillour Castle is located in the central part of the garden, 90m north of the convergence of the Keillour Burn and the Horn Burn. The Historic Scotland entry for Keillour Garden describes it as a predominantly woodland garden landscape, dominated by the steep gorge-side setting and containing an important plant collection (HS 2011).
- 5.13 According to Historic Scotland, the importance of the site is predominantly derived from its outstanding value as a work of art, in the way that the plant material has been established in the natural gorge setting. The gardens are considered to be of little intrinsic historical value, as they were predominantly created after 1938 and replaced existing 19th-century gardens, although several pieces of stonework from the Houses of Parliament have been incorporated into the garden. The history of Keillour goes back to the 13th century although documentary evidence of the development of the house is scant. The garden is considered to be of some architectural value as it provides the setting for a Category C listed building (Fig. 10).
- 5.14 The setting of Keillour Garden is dominated by the natural gorges which run approximately north-south through the gardens, with the house and garden situated on the banks of the gorges and on the ridge between them. The Keillour and Gorthy Forests to the north of the Castle are also significant in the local landscape (HS 2011; Fig. 12), and give the wider setting of the garden a distinctly upland character. Historic Scotland note that views into and out of the garden from the surrounding area are restricted by the nature of the local landform and by the dense tree and shrub planting within the garden (HS 2011; Fig. 7 and 8).
- 5.15 Views of the Castle, the burns and associated gorges from within the grounds of Keillour form the key elements of the garden's setting, as views out into the wider landscape are largely screened by vegetation within the garden and the local topography (Fig. 9 and 10). The main south drive, lined with Japanese maples and

shrubs, passes along the east side of the woodland garden en route to the Castle and commands a strong southerly aspect towards the house. Lawns extend from the house to the east and south and straddle the hillside that steeply falls away to the south. To the north of the Castle the kitchen garden is situated between the old tennis court and Green of Keillour. Further buildings at the Green of Keillour, and vegetation beyond, are likely to largely screen views to the north from within the garden.

- 5.16 The broader setting of the garden comprises surrounding agricultural land and extensive areas of plantation (Fig. 9 and 11). This element does not significantly contribute to the value of the garden, as views to the north and north-west are limited by rising topography (Fig. 7 and 8), while those to the south are largely screened by vegetation within the garden. Partial views of Strathearn lowland to the south are likely to be possible from the southern parts of the garden (Fig. 9). The garden is visible when viewed from the lowland to the south of Keillour (as a distinctive area of deciduous woodland), although the garden is not especially prominent (Fig. 10). The current setting of the gardens strongly contributes to its significance.
- 5.17 Steeply rising topography to the north of Keillour Garden and the intervening forestry plantations at Gorthy Wood and Keillour Forest screen the proposed development site from Keillour Garden (Fig. 7 and 8). Plantation in the immediate vicinity of the proposed turbine location (Fig. 13), together with the steep valley side to the south of the turbine (Fig. 12) completely screens Keillour Garden from the proposed turbine. As such, the proposed development will have no impact upon the setting of Keillour Garden.

Keillour Castle

- 5.18 Keillour Castle, listed category C, is located approximately 2.4km south-east of the site and was built within Keillour Garden in c.1877 to the design of Andrew Heiton. The House is situated on the ridge between the gorges of the Keillour Burn and the Horn Burn and faces south-east across associated lawns (HS 2011; Haynes 2000, 81). It is from these gorges that Keillour is likely to derive its name, the term 'Caol' meaning 'narrows' (Darton 1990, 248). The earliest records of Keillour go back to the 13th century when the lands were owned by the Fourth Earl of Strathearn, although the current house was built at the request of William Thomsson and is located upon the site of this earlier residence which burnt down in the 17th century.

- 5.19 The setting of Keillour Castle comprises the surrounding Keillour gardens (Fig. 10) and the two gorges which pass to the east and west of the house. The house is located upon a narrow promontory created by the convergence of the Keillour Burn and Horn Burn and it is this setting that strongly contributes to the setting of the house. The South Drive which links Keillour Castle to the Green of Keillour 120m north of the house also forms part of the setting. The surrounding wooded gardens screen the house and largely limit the contribution of the local landscape (beyond the gorges) to the setting of Keillour Castle.
- 5.20 The broader setting of the house comprises surrounding agricultural land located on the south-facing slopes overlooking the Strathearn. This setting is largely screened by vegetation within the surrounding garden, although partial, extensive, views to the south may be possible from the house (Fig. 9). The house is largely screened from its wider setting and as such is not a locally dominant feature, although very partial views of the house are possible (through surrounding vegetation) from the lane to its south-west (Fig. 11).
- 5.21 The proposed development will not be visible from Keillour Castle due to rising topography to the north of the house (Fig. 10), intervening buildings at the Green of Keillour and surrounding vegetation within Keillour Garden. As such, there will be no impact upon the setting of Keillour Castle.

Potential non-physical (visual) impacts upon the setting of Designated cultural heritage assets in the vicinity of the site

- 5.22 An assessment of the potential non-physical (visual) impact upon further cultural heritage assets in the wider vicinity of the site was not identified during screening opinion. However, it was deemed appropriate to assess the potential impact upon four further Listed Buildings in the wider landscape; namely the Category B Listed Trinity College Lodge and Tulchan Gardens, and the Category C Listed West Tulchan and Mercer Burial Ground.

Trinity College Lodge

- 5.23 Trinity College Lodge is located approximately 2.1km to the north-east of the site (see Fig. 3). The building comprises a Gothic gatehouse with circular towerlet built in 1864 at the south-western entrance into Trinity College.

5.24 The setting of the lodge comprises its roadside location at the southern end of the drive leading to the Category A Listed Trinity College. The wider setting comprises surrounding woodland, agricultural land and the properties at The Cairnies. The current setting of Trinity College Lodge contributes to its value as a heritage asset.

5.25 Views towards the site are screened by intervening vegetation (Fig. 15) and rising topography. Very partial views of the turbine tips may be possible through the mature tree growth to the south of the Lodge. However, the key setting of the Lodge, comprising its relationship with the road and driveway to Trinity College will not be altered. As such, any visual impact upon Trinity College Lodge is considered to be negligible.

Tulchan Gardens

5.26 Tulchan Gardens is a Category B Listed Building comprising a single-storey structure and associated two-storey tower constructed in c.1830, located approximately 1.3km to the north-west of the site (see Fig. 3).

5.27 Tulchan Gardens appears to have a southerly aspect, and the immediate setting of the house comprises a small surrounding ornamental garden to the east, south and west of the house. Tall vegetation within the garden completely screens the house from the lane to the south, and is likely to completely screen wider views of the surrounding landscape from the house. The wider setting of the house comprises surrounding agricultural land and the valley of the River Almond to the north of the house. The current setting of Tulchan Gardens strongly contributes to the value of the asset.

5.28 The proposed development site is likely to be completely screened from the house, although views from the two-storey tower towards the south may include elements of the proposed development. These views will not alter the relationship between Tulchan Garden House and the surrounding ornamental garden, although they may alter part of the wider setting of the house. As such, there may be a minor impact upon the wider setting of Tulchan Gardens, and consequently a negligible impact upon the significance of the building as a whole.

West Tulchan

5.29 West Tulchan is a Category C Listed Building comprising a two-storey farm building built in c. 1830 approximately 1.2km north of the site.

5.30 The farm building and its associated outbuildings are arranged around a central farmyard and the main farmhouse has a strong northerly aspect, facing onto the lane and gardens to the north of the house. The First Edition Ordnance Survey map recorded the farmstead as surrounded with plantation and its original setting was consequently limited to its immediate surroundings. The key setting of West Tulchan comprises its relationship with surrounding buildings located around the farmyard to the south and the visual relation with the lane to the north. The wider setting comprises agricultural land and surrounding areas of plantation, and the north-facing valley side of the River Almond 200m north of the site. The current setting of West Tulchan makes a minor contribution to its value as a heritage asset.

5.31 The ground within the proposed development site is likely to be screened from West Tulchan by rising topography, intervening plantation and additional buildings to the south of the farmyard. The proposed turbine, however, may be partially visible from the Category C Listed Building. Views were assessed from the roadside in the vicinity of West Tulchan, and views from the roadside 300m east of the asset towards the proposed development site include the electricity pylons that extend across the eastern part of the site (Fig. 14), and it is therefore likely that the proposed turbine will also be visible.

5.32 The key setting of West Tulchan, comprising its relationship with adjacent farm buildings and the lane which passes immediately to the north, will not be altered. Part of the wider setting of West Tulchan, namely views to the south across rising ground towards the proposed development, are likely to be impacted upon. This will result in a minor impact upon the wider setting of the Category C Listed Building, and consequently a negligible impact upon the significance of the building as a whole.

Mercer Burial Ground

5.33 The Mercer Burial Ground is a Category C Listed structure comprising a burial enclosure of the Mercer family (of Perth) dating to 1877. The enclosure is formed by railings and two square, coped gatepiers bearing tablets inscribed with information relating to the Mercer family history. This asset is located 70m south of the River Almond, and 1.4km north of the site.

- 5.34 The current setting of Mercer Burial Ground comprises a small copse of woodland to the south of the River Almond, on ground that descends towards the north and the base of the river valley. The Burial ground is accessed by a footpath only, and the current setting is extremely secluded. The current setting of Mercer Burial Ground strongly contributes to its value as a cultural heritage asset.
- 5.35 Due to the rising topography to the south of the burial ground and the vegetation in its immediate vicinity the proposed development is likely to be completely screened from the asset. As such, the existing setting of the burial ground will not be altered.

6. CONCLUSIONS

- 6.1 There are no recorded cultural heritage assets within the site. Heritage assets recorded in the vicinity of the site comprise the 19th-century farmstead at Drummick to the north-east, the site of a 19th-century farmstead at Gorthy Wood to the west, and the rubble remains of a possible shieling to the south. Development proposals will have no known physical impact upon the cultural heritage resource.
- 6.2 There will be no non-physical (visual) impact upon the setting of Keillour Garden and Keillour Castle. Rising topography and intervening forestry plantation completely screen the proposed development site from these assets. Furthermore, the topographical setting of Keillour Castle and Garden, and vegetation within the gardens themselves, create a secluded setting which is largely screened from the surrounding landscape. The non-physical (visual) impact upon the significance of further designated heritage assets in the vicinity of the site is considered to be negligible. Intervening topography and vegetation largely screen the proposed development from nearby heritage assets.

7. REFERENCES

BGS (British Geological Survey) 2010 *Geology of Britain Viewer*. Online resource at http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html viewed December 2011

Breeze, D. J. 1982 *The Northern Frontiers of Roman Britain*

- Darton, M. 1990 *The Dictionary of Scottish Place Names*
- DCLG 2010 *Planning Policy Statement 5: Planning for the Historic Environment (Communities and Local Government 2010)*
- DCLG et al 2010 *Planning Policy Statement 5: Planning for the Historic Environment: Historic Environment Practice Guide* (Communities and Local Government), DCMS (Department of Culture, Media and Sport) and EH (English Heritage)
- Devine, T. M. 2006 *Clearance and Improvement: Land, Power and People in Scotland 1700-1900*
- Haynes, N. 2000 *Perth and Kinross: an illustrated guide*
- Historic Scotland (HS) 2011 <http://data.historic-scotland.gov.uk/pls/htmldb/f?p=2400:15:0::::GARDEN:GDL00230>
- IFA 2008 *Standard and Guidance for Archaeological Desk-Based Assessment*
- National Library of Scotland (NLS) 2011 <http://maps.nls.uk/roy/background.html>
- Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS) 1994 *South East Perth: An Archaeological Landscape*
- Strachan, D. 2011 *Perth: A Place in History*
- Woolliscroft, D.J. and Hoffmann, B. 2006 *Rome's First Frontier: The Flavian Occupation of Northern Scotland*
- Woolliscroft, D.J. and Hoffmann, B. 2010 *The Roman Gask Project Annual Report 2010*

Cartographic sources

1746	An exact map of the Country around Perth	(PLSL)
1747-1755	Roy's Military survey of Scotland	(NLS)

1783	James Stobie's Map of Perthshire	(PLSL)
1868	First Edition 25" Ordnance Survey map	(sheet: Perthshire 84.14)
1868	First Edition 25" Ordnance Survey map	(sheet: Perthshire 84.15)
1868	First Edition 6" Ordnance Survey map	(sheet: Perthshire 84.SW)
1880	Map of the Estate of Keillour	(NAS: RHP 3332)
1901	Second Edition 25" Ordnance Survey map	(sheet: Perthshire 84.14)
1901	Second Edition 25" Ordnance Survey map	(sheet: Perthshire 84.15)
1901	Second Edition 25" Ordnance Survey map	(sheet: Perthshire 96.2)

NLS: National Library of Scotland online resource

NAS: National Archives of Scotland

PLSL: Perth Local Studies Library

Aerial photographic sources


1988 (June)	006-002-000-915-C	(NCAP)
-------------	-------------------	--------


NCAP: National Collection of Aerial Photography


APPENDIX A: GAZETTEER OF RECORDED HERITAGE ASSETS AND OTHER ELEMENTS OF THE HISTORIC ENVIRONMENT


No.	Description	Period	Status	NGR (all NN)	PKHER ref. RCAHMS ref. HS ref.	Major Source
1	West Tulchan. White-washed farmhouse dating to c. 1830.	Modern	C(S) Listed	9514 2825	12220 MPK1461	HS
2	Find spot of an undated cylindrical pounder and a Neolithic stone ball.	Prehistoric		9600 2800 (approx)	MPK1456 MPK1458 26109 26107	PKHER
3	Find spot of a claystone axe.	Prehistoric		9500 2600 (approx)	MPK1466 26117	PKHER
4	Late 18th-century sheep fold at Drummick.	Post-medieval		9622 2720	MPK16234	PKHER
5	Late 18th-century farmstead at Wester Kingcam.	Post-medieval		9651 2645	MPK16236	PKHER
6	Drummick Farmstead and horse engine house.	Modern		9572 2721	MPK16233	PKHER
7	Site of a farmstead at Gorthy Wood.	Modern		9489 2701	MPK9559 140523	PKHER
8	Site of a small homestead at South Tulchan.	Modern		9489 2713	MPK15165	PKHER
9	Sluidubh Farmstead and horse engine house.	Modern		9584 2648	MPK16235	PKHER
10	The site of New Drummick farmstead.	Modern		9673 2727	MPK14554	PKHER
11	Site of Den of Keillour Farmstead.	Modern		9682 2654	MPK9570 140534	PKHER
12	Two brick shafts recorded at Loch Horn.	Modern		9655 2579	MPK17525	PKHER
13	Farmstead at South Buchanty	Modern		9389 2747	MPK11662	PKHER
14	A natural rock outcrop formerly recorded as a 'fort' and a 'cairn'.	Undated		9452 2700	MPK1494 26148	PKHER
15	The possible remains of a shieling, comprising the possible tumbled remains of a stone-built structure.	Undated		9541 2657	-	Site visit


APPENDIX B: BUILDING SURVEY


Building name – Drummick Farmhouse (A)	
NGR: NN 9573 2719	
Designation: -	
Number on plan: A	
Building type/purpose including previous uses where appropriate: Farmhouse	
Construction materials: Stone and tile	
Approximate date: 19th century; first recorded on the 1866 Ordnance Survey map. A settlement is first recorded at Drummick in the late 18th-century and it is possible elements of this structure date to this period.	
Other information: - A small timber shed has been constructed to the west of the farmhouse. The extension to the north of the house dates to the 20th century.	
Compiled by: NB	Date: 02/11/11


Building name – Drummick Barn (B)	
NGR: NN 9570 2720	
Designation: -	
Number on plan: B	
Building type/purpose including previous uses where appropriate:	
Construction materials: red brick and corrugated iron.	
Approximate date: Late 19th century; first recorded on the 1866 Ordnance Survey map.	
Other information: - The horse engine shed recorded to the west of the barn on the First Edition Ordnance Survey map suggests this was formerly a threshing barn.	
Compiled by: NB	Date: 02/11/11


Building name – Cattle Shed (C)	
NGR: NN 9572 2721	
Designation: -	
Number on plan: C	
Building type/purpose including previous uses where appropriate: Cattle Shed.	
Construction materials: Steel and iron.	
Approximate date: Late 20th-century; first recorded on 1988 aerial photograph.	
Other information: -	
Compiled by: NB	Date: 02/11/11

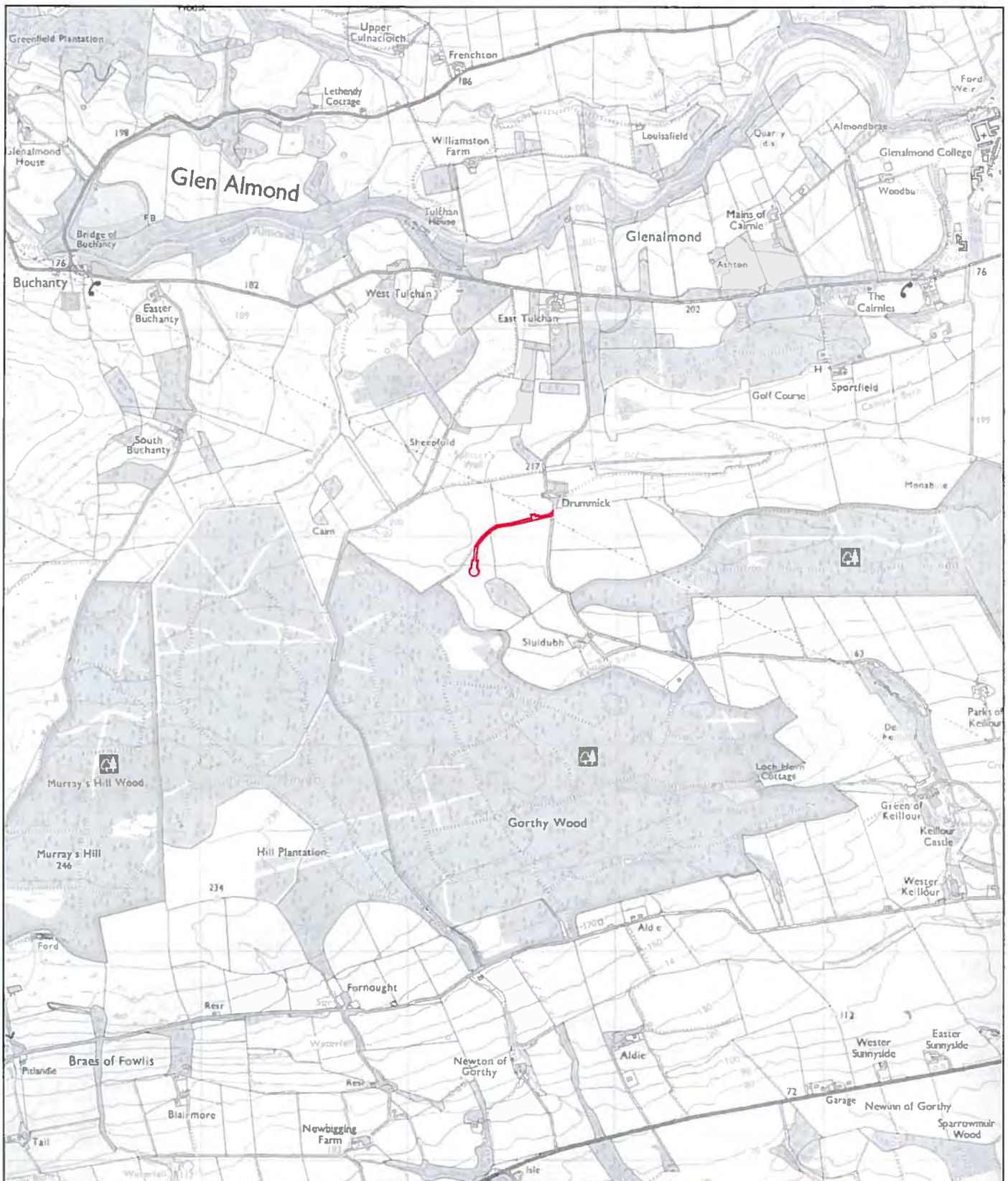
Building name – Agricultural shed (D)	
NGR: NN 9569 2721	
Designation: -	
Number on plan: D	
Building type/purpose including previous uses where appropriate:	
Construction materials: Corrugated iron and steel.	
Approximate date: Mid/late 20th-century; first recorded on 1969 Ordnance Survey map.	
Other information: -	
Compiled by: NB	Date: 02/11/11

Building name – Derelict shed (E)	
NGR: NN 9568 2721	
Designation: -	
Number on plan: E	
Building type/purpose including previous uses where appropriate: Derelict shed	
Construction materials: Steel, brick and iron.	
Approximate date: Mid/late 20th-century; first recorded on 1969 Ordnance Survey map.	
Other information: -	
Compiled by: NB	Date: 02/11/11

Building name – Large modern barn (F)	
NGR: NN 9573 2724	
Designation: -	
Number on plan: F	
Building type/purpose including previous uses where appropriate: Modern agricultural barn.	
Construction materials: steel, timber and iron.	
Approximate date: Late 20th-century; first recorded on 1988 aerial photograph.	
Other information: -	
Compiled by: NB	Date: 02/11/11

Building name – Drummick Bungalow (G)	
NGR: NN 9565 2719	
Designation: -	
Number on plan: G	
Building type/purpose including previous uses where appropriate: Single storey residential property.	
Construction materials: Brick, concrete and tile.	
Approximate date: Mid/late 20th-century; first recorded on 1969 Ordnance Survey map.	
Other information: -	
Compiled by: NB	Date: 02/11/11

Building name – Small agricultural shed (H)	
NGR: NN 9588 2732	
Designation: -	
Number on plan: H	
Building type/purpose including previous uses where appropriate: Small agricultural outbuilding located in field to north of Drummick Farm.	
Construction materials: Brick and timber.	
Approximate date: Late 20th century; first recorded on 1978 Ordnance Survey map.	
Other information: -	
Compiled by: NB	Date: 02/11/11



**Cotswold
Archaeology**

T 01285 771022
F 01285 771033
W www.cotswoldarchaeology.co.uk
E enquiries@cotswoldarchaeology.co.uk

PROJECT TITLE

**Drummick, Glenalmond Wind Turbine
Perthshire, Scotland**

FIGURE TITLE

Site location plan

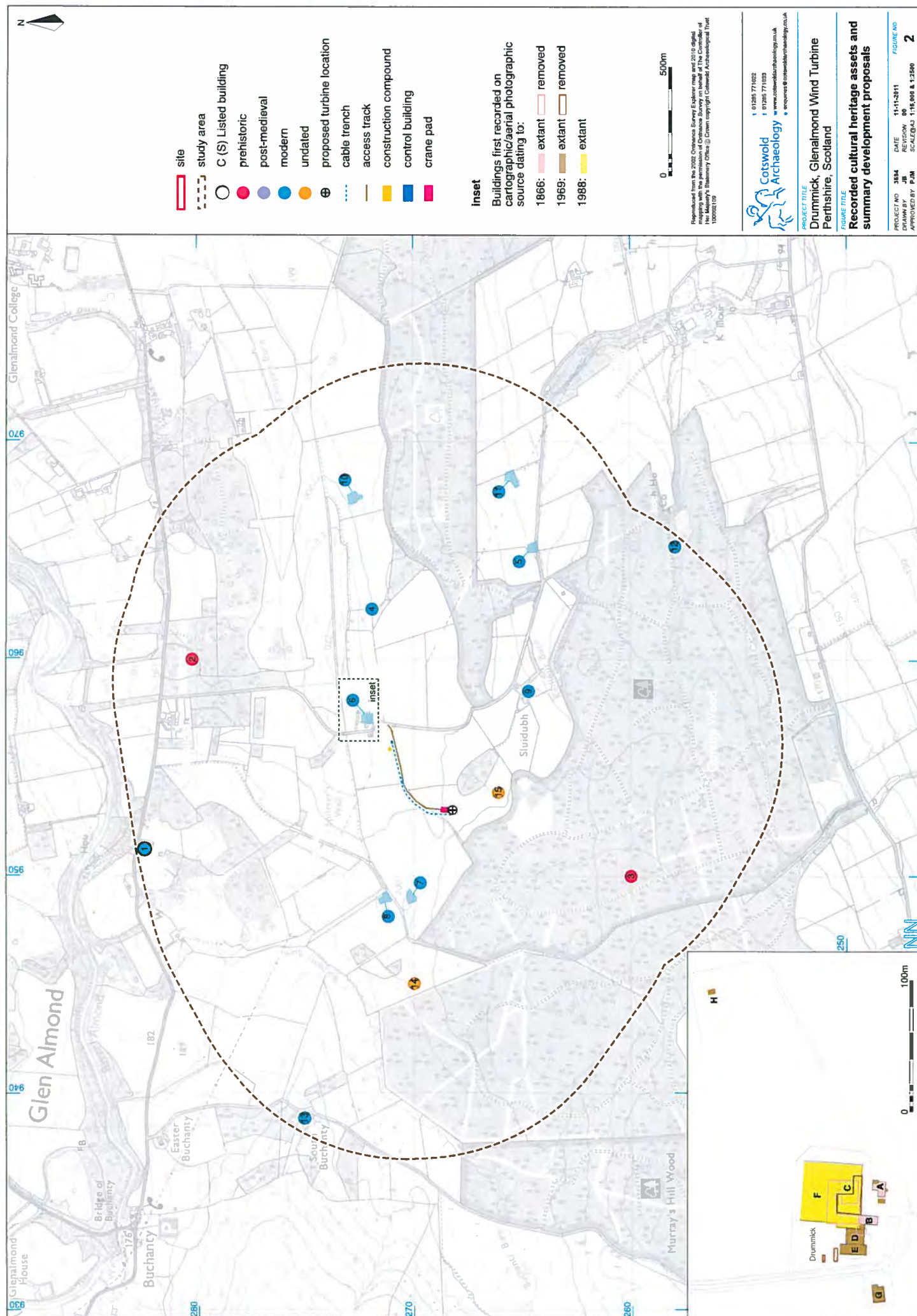
0 1km

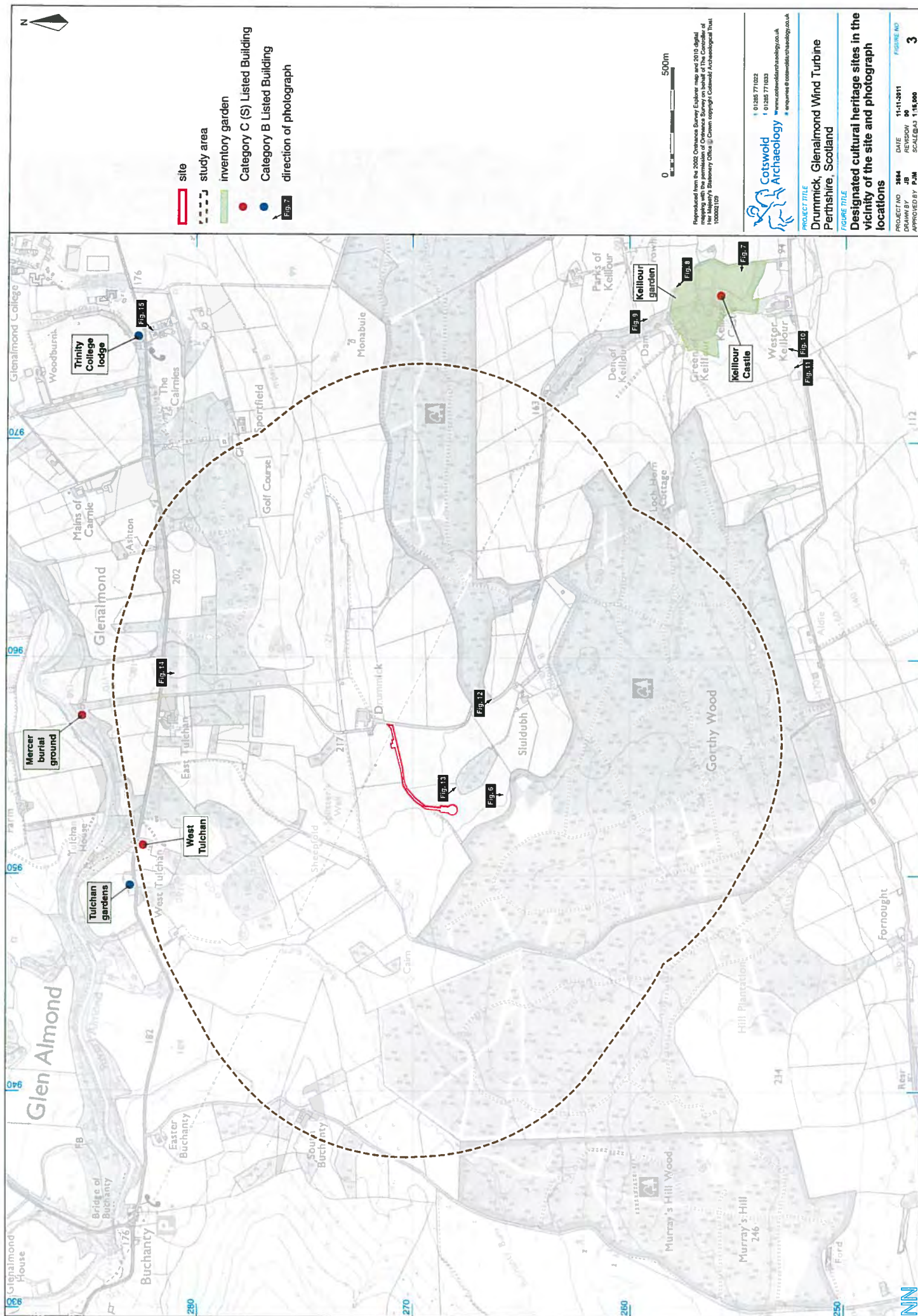
Reproduced from the XXXX Ordnance Survey Explorer map with the permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office © Crown copyright Cotswold Archaeological Trust 100002109

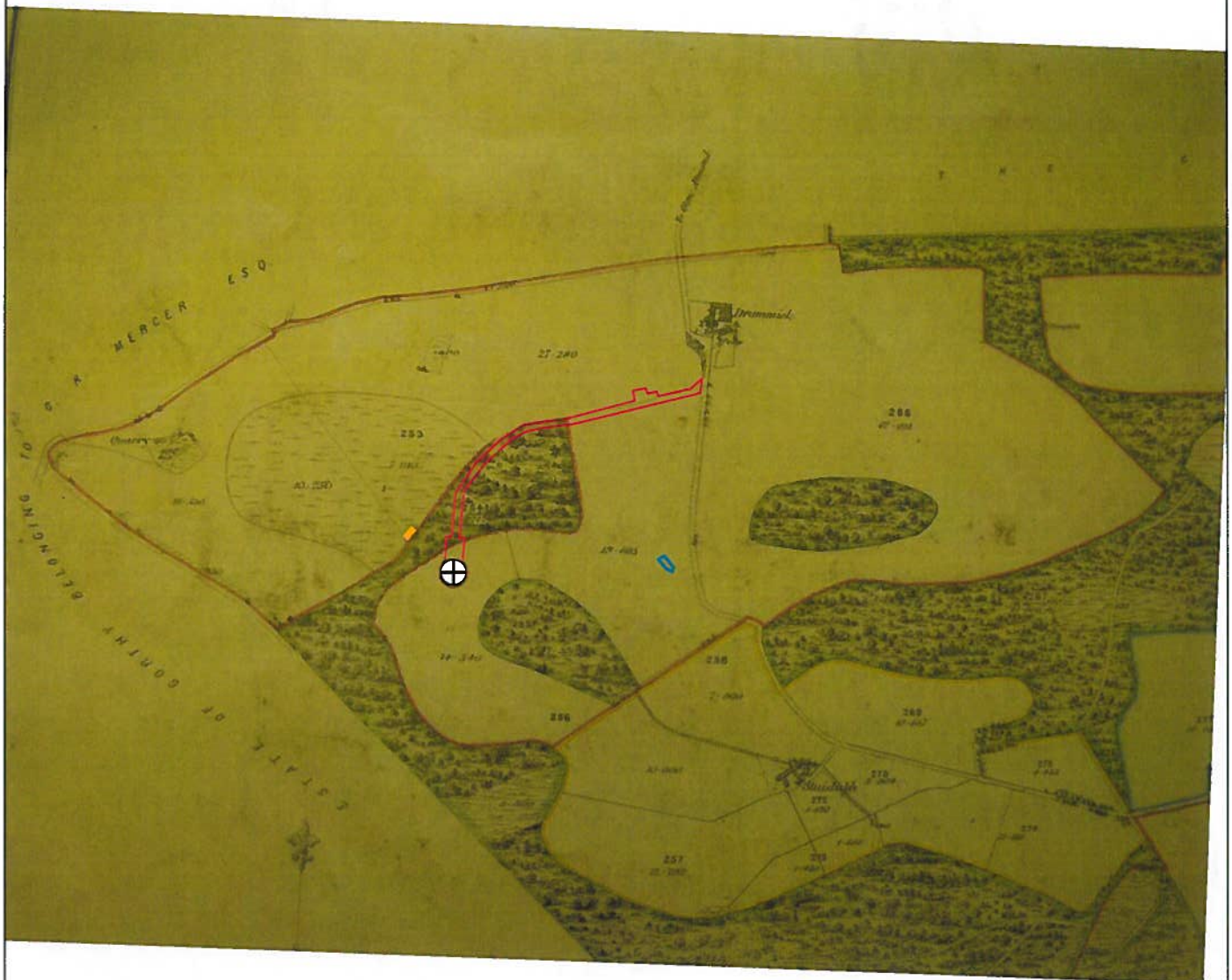
PROJECT NO. 3594 DATE 10-11-2011
DRAWN BY JB REVISION 00
APPROVED BY PJM SCALE@A4 1:25,000

FIGURE NO

1







- site
- ⊕ proposed turbine location
- sheepfold recorded on 1901 Ordnance Survey map
- quarry recorded on 1868 Ordnance survey map



**Cotswold
Archaeology**

t 01285 771022
f 01285 771033
www.cotswoldarchaeology.co.uk
enquiries@cotswoldarchaeology.co.uk

PROJECT TITLE

**Drummick, Glenalmond Wind Turbine
Perthshire, Scotland**

FIGURE TITLE

**Extract from the 1880 map of Keillour
Estate**


PROJECT NO. 3594 DATE 11-11-2011
DRAWN BY JB REVISION 00
APPROVED BY PJM SCALE@A4 1:10,000 (approx.)

FIGURE NO

4



 site

 proposed turbine location



**Cotswold
Archaeology**

01285 771022
01285 771033
www.cotswoldarchaeology.co.uk
enquiries@cotswoldarchaeology.co.uk

PROJECT TITLE

**Drummick, Glenalmond Wind Turbine
Perthshire, Scotland**

FIGURE TITLE

Aerial photograph taken in 1988

PROJECT NO **3594**
DRAWN BY **JB**
APPROVED BY **PJM**

DATE **11-11-2011**
REVISION **00**
SCALE@A4 **1:10,000 (approx.)**

FIGURE NO
5



- 6 Remains of a possible shieling in the south-west part of the site
- 7 View to site from immediately south-east of Kellour Garden
- 8 View towards the site from immediately east of Kellour Garden
- 9 View south-east from lane across Kellour Garden towards Strathearn



01235 771032
 01235 771033
www.cotswoldarchaeology.co.uk
enquiries@cotswoldarchaeology.co.uk

PROJECT TITLE

Drumnick Glenalmond Wind Turbine

Perthshire, Scotland

FIGURE TITLE

Photographs

PROJECT NO	1884	DATE	14-11-2011	FIGURE NO	6 - 9
DRAWN BY	JR	REVISION	00		
APPROVED BY	PJM	SCALE	A1 N/A		



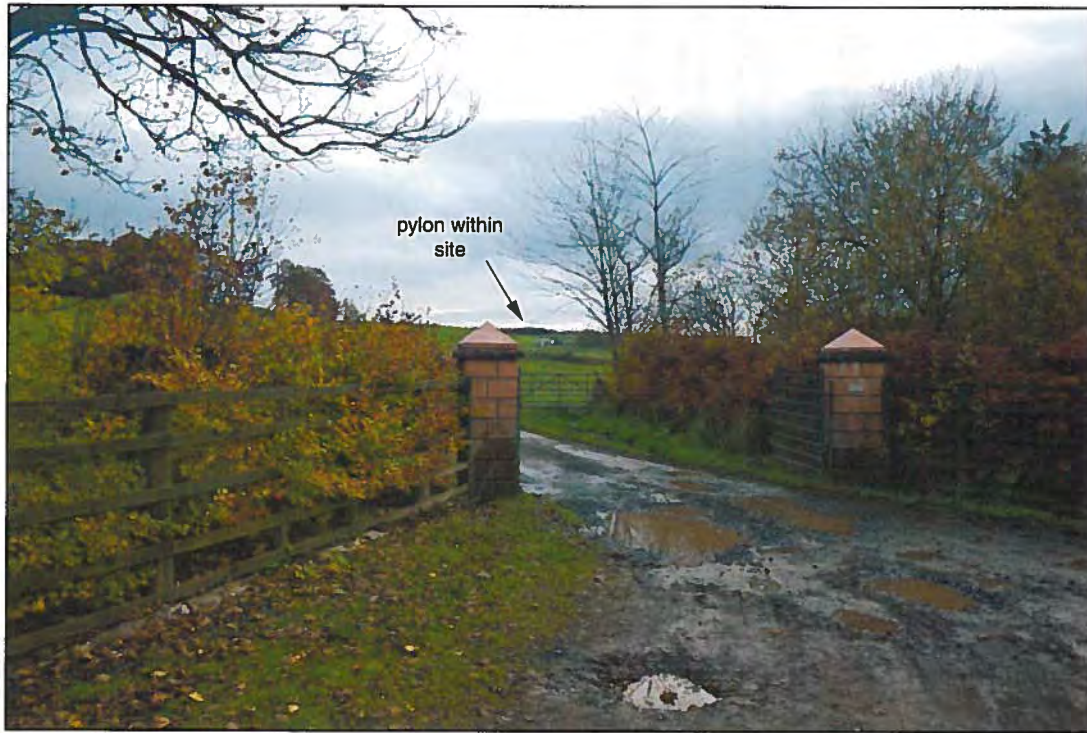
- 10 View north-east towards secluded setting of Keillour Castle, from lane to south-west
- 11 View to site from lane to south-west of Keillour Garden
- 12 View towards Keillour Garden from lane to east of site
- 13 View towards Keillour Garden from proposed turbine location

Cotswold Archaeology
 01285 771022
 www.cotswoldarchaeology.co.uk
 enquiries@cotswoldarchaeology.co.uk

PROJECT TITLE
 Drummick Glenalmond Wind Turbine
 Perthshire, Scotland

FIGURE TITLE
 Photographs

PROJECT NO	3884	DATE	11-11-2011	FIGURE NO
DRAWN BY	JB	REVISION	00	
APPROVED BY	PJM	SCALE	NA	10 - 13



14



15

14 View to site from roadside to the west of East Tulchan

15 View to site from roadside to the east of Trinity College Lodge

 **Cotswold Archaeology**
 t 01285 771022
 f 01285 771033
 www.cotswoldarchaeology.co.uk
 enquiries@cotswoldarchaeology.co.uk

PROJECT TITLE
 Drummick, Glenalmond Wind Turbine
 Perthshire, Scotland

FIGURE TITLE
 Photographs

PROJECT NO 3594	DATE 11-11-2011	FIGURE NO
DRAWN BY JB	REVISION 00	14 & 15
APPROVED BY PJM	SCALE A4	






Drummick

Drummick Wind Turbine:
Traffic and Transport Report

Drummick

Drummick Wind Turbine: Traffic and Transport Report

Document Control

Responsible for	Job Title	Name	Date	Signature
Content	Project Manager	Ben Pollard	2011-11-18	
Checked	Development Consultant	Stephanie Clarke	2011-11-23	
Approval	Director	David Bean	2011-11-28	

Copyright: PMSS ©

Document Reference:

29827

Signatures in this approval box have checked this document in line with the requirements of QP16

This report has been prepared by Project Management Support Services Ltd with all reasonable skill and care, within the terms of the contract with the Client. The report contains information from sources and data which we believe to be reliable but we have not confirmed that reliability and make no representation as to their accuracy or completeness.

The report is confidential to the Client and Project Management Support Services Ltd accepts no responsibility to any third party to whom information in this report may be disclosed. No part of this document may be reproduced without the prior written approval of Project Management Support Services Ltd

Record of Changes

Revision Number	Date	Page Number	Description	Approved
A	2011-11-28	All	Initial Draft for Review	SHC
B	2011-12-15	6-9	Amendments to AADT Data	BPO
C				
D				
E				
F				
G				
0	2011-11-28	All	Client Issue	DB
1	2011-12-15	6-9	Client Issue	SHC
2				
3				
4				
5				
6				

Distribution List

#	Function Title	Company	Name (optional)
1	Director	ClearWinds Limited	William Clare
2	Project File 29827	PMSS Ltd	Bath Server
3	Senior Environmental Planner	Pegasus Planning Group	Annabel Roberts
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Notes:

Table of Contents

1.	Traffic and Transport	5
1.1.	Introduction	5
1.2.	Summary	5
1.3.	Separation from Public Roads and Footpaths	5
1.4.	Methodology and Consultation	6
1.4.1.	Baseline	6
1.5.	Construction Phase Traffic Generation	6
1.5.1.	Total Construction Phase Traffic Generation	8
1.5.2.	Daily Construction Traffic	8
1.6.	Construction Traffic Main Routes	8
1.6.1.	Public Access to Drummick	9
1.7.	Conclusions	9
	Appendix 1 VRI Report	10
	Appendix 2: Swept Path Analysis (SPAn)	29
	Appendix 3 AADT Measurement Point	34

Abbreviations

AADT	Annual Average Daily Traffic	PROW	Public Right of Way
DfT	Department for Transport	SPAn	Swept Path Analysis
HGV	Heavy Goods Vehicle	VRI	Visual Route Inspection
LPA	Local Planning Authority	WTG	Wind Turbine Generator
PPS	Planning Policy Statement		

1. Traffic and Transport

1.1. Introduction

This report assesses the potential for any transportation effects associated with the construction of the single wind turbine generator (WTG) at Drummick.

The only significant impact to traffic as a result of a wind farms construction is due to the movement of Heavy Goods Vehicles (HGVs). That said the transport impacts associated with a single WTG construction are modest in scale and duration.

Once the WTG is operational the amount of traffic associated with its operation is minimal. Visits would be made on a regular, but infrequent, basis by a light vehicle such as a transit van or 4x4. There may be a requirement of a HGV in the case of any repair or replacement part during the useful life time of the WTG. The operational traffic is deemed minimal and does not need to be considered in this assessment.

When the WTG is decommissioned there may be further impact on the local highway in the removal of the equipment and materials from site.

1.2. Summary

A suitable route to the WTG location has been assessed and can be completed as follows; the route will use the M90, exit onto the A9 (North East), exit to the A85, turn right onto the A822, turn right onto B8063 continue straight ahead onto a C classified road then turn right onto a further C classified road where site access gain be gained. A Visual Route Inspection (VRI) has been prepared and is included in Appendix 1 along with accompanying Swept Path Analysis (SPAN) in Appendix 2.

Access to the wind farm site will be gained via a new entrance off a C-Classification Road, south of Drummick Farm Cottage, PH1 3SF.

The access point can be made via an existing gateway which leads into fields under control of the project. The access point would require further widening to allow the large vehicles to complete the turning.

1.3. Separation from Public Roads and Footpaths

The nearest public road to the Drummick site is the C-Classification road to the east of the WTG location. "Planning for renewable energy – A companion guide to Planning Policy Statement (PPS) 22" states in its wind technical annex, paragraph 54: "Although a wind turbine erected in accordance with best engineering practice should be a stable structure, it may be advisable to achieve a set back from roads and railways of at least fall over distance, as to achieve maximum safety". The WTG is approximately 480m from the C-Classification Road and the tip height of the turbine is 77m.

There are no bridleways, footpaths, or any other public rights of way (PROW) crossing the Drummick site.

1.4. Methodology and Consultation

The following steps were taken:

Review of the Department for Transport (DfT) Annual Average Daily Traffic Flows database.

1.4.1. Baseline

The following information was taken from the DfT database of automated traffic count data.

- The Annual Average Daily Transport (AADT) information for a point to the north of Gilmerton on the A822 (see Appendix 3).

The information shows that the AADT for this point is **976** vehicle movements (note these are movements in either direction i.e. 2 way movements). This represents a traffic count completed in 2010.

The information provided also gives a breakdown of vehicle movements by specific vehicle, as shown on **Table 1** below:

Table 1: AADT

2 Wheeled Vehicles	Car	Bus	LGV	HGV	Total
50	692	14	176	44	976

1.5. Construction Phase Traffic Generation

Estimates of the traffic generation associated with the WTG at Drummick are based on the following activities:

- Delivery and removal of plant, equipment and materials
- Delivery of stone for the formation of the onsite access tracks and crane pad
- Delivery of reinforcing steel for the turbine foundation and substation
- Delivery of ready mixed concrete
- Delivery of cabling to connect the turbine to the onsite substation
- Delivery of WTG base ring or can
- Delivery and removal of the support crane and main crane for turbine installation
- Delivery of the WTG components
- Travel to and from site by the construction personnel and site staff

It is expected that the construction of the wind farm will take place in stages over a 3 month period.

Delivery and removal of plant, equipment and materials

A range of plant, equipment and materials will be delivered and subsequently removed from site, including excavators, dump trucks, site cabins and compound etc. It is anticipated that this activity will require **39** HGV movements throughout the construction period.

It is anticipated that all excavated materials can be utilised across the site during the reinstatement phase and no removal of spoil will be necessary.

Delivery of stone for the formation of the site access tracks and crane pad

A suitable stone track is required to gain access to the turbine location, along with a similarly constructed crane hard stand. The width of the access track is 5m and the approximate depth of stone is 300mm, it is estimated that 502m³ of new road is required, this equates to 753m³ of stone.

The crane hard stand measures 35m by 30m and the depth of stone is 300mm (subsequent to sufficient load bearing capacity at the time of construction), this equates to a further 315m³ of stone.

The temporary construction compound measures 20m by 20m and the depth of stone approximately 300mm this equates to a further 120m³ of stone.

In total 1188m³ of stone is required. Generally a stone delivery vehicle can transport 10m³ per load, this would result in **119** HGV movements.

Delivery of reinforcing steel for the turbine foundation and substation

The turbine foundation would require approximately 35 tonnes of steel (dependent on the final turbine supplier selected and the specific ground conditions at the time of construction), a further 5 tonnes of steel is anticipated for the substation construction. This equates to **2** HGV deliveries to site.

Delivery of ready mixed concrete

The size of the foundation is approximately 12m by 12m by 2.3m deep this would require approximately 331m³ of concrete. A further 20m³ of concrete is required for the base slab of the substation.

A total of 351m³ of concrete is required; a typical concrete transport can carry 6m³ which would result in **59** HGV movements.

Delivery of cabling to connect the WTG to the onsite substation

The delivery of all the cabling required to connect the turbine would be achieved in **1** HGV movement. In addition, to protect the cable it is laid on a bed of fine cable dust (a sand-like insulating material which helps to dissipate any heat generated within the cables) and surrounded similarly. Delivery of this would result in a total of **6** HGV movements.

Delivery of turbine base ring or can

The turbine base ring or can will be delivered to site in **1** HGV movement.

Delivery and removal of the support crane and main crane for turbine installation

The installation of the turbine requires the use of 2 cranes, a support crane and a main crane. The selection of the crane contractor will be made by the turbine supplier selected, however for a turbine of this size it is anticipated that a 100t support crane and 500t main crane will be used. This results in **15** HGV movements.

Delivery of the WTG components

The turbine will require a total of **8** abnormal load movements, 3 for the tower sections, 1 for the nacelle, 3 for the blades and 1 for the blade hub and nose cone. In addition to

the main components of the WTG a further HGV movement is required for ancillary parts.

Delivery of electrical equipment for the substation

The various pieces of electrical equipment for the substation will be dependent on the full electrical design of the site, however it is anticipated that there will be approximately **5** HGV movements required.

Delivery of fuel for the machinery

It is expected that 2 deliveries per week of fuel are required for the machinery on site through the construction period. This results in **24** HGV movements.

Travel to and from site by the construction personnel and site staff

Staff and personnel will travel to site from a variety of directions and different means. The number of staff on site during the construction phase will vary greatly depending on the current activity. These trips are unlikely to have any impact on the road network and are likely to be made in cars.

1.5.1. Total Construction Phase Traffic Generation

On the basis of the above assumptions the construction of the proposed WTG at Drummick would generate **279** HGV movements.

In order to compare this value with the base line data it has to be given in 2-way movements, i.e. 1 movement to the site and 1 movement away from the site. This would give a 2-way movement of **558**.

1.5.2. Daily Construction Traffic

The predicted number of movements of HGV vehicles is 558 spread over a three month period. The periods of most frequent HGV movements are the first 2 weeks (when stone deliveries are at their peak) and week 5 (when the concrete for the turbine foundation is being poured). It would be reasonable to anticipate **18** HGV movements occurring daily in the periods noted above. This figure would represent a **40%** daily rise in the flow of HGVs on the A822, however relating to overall traffic flows (976) this represents a figure of less than 2%.

1.6. Construction Traffic Main Routes

The sourcing of materials and the WTG itself will not be determined until closer to the time of construction, however it is a fair assumption that the vehicles accessing the site will arrive from the east (the Perth locality). The medium/longer distances can gain access to the A9 from a number of other routes.

In terms of immediate access to the site, it is recognised that the A822 will provide access to the C classification road and lead to a second C classification road where Drummick Farm Cottage is located (PH1 3SF). South of the farm the entrance to the site can be found.

It is anticipated that the transportation of the WTG components will require a few remedial works to be completed along the road network. Appendix 1 'Drummick VRI', and Appendix 2 'Swept Path Analysis' list the expected land take and road widening

required, although this is dependent on the final selection of the WTG and the haulage company contracted.

1.6.1. Public Access to Drummick

There is no PROW onto Drummick, however, there are over head electrical lines crossing to the east of the site in a north-south orientation. Occasional access may be sought from the over head line operator.

1.7. Conclusions

The potential impact of HGV traffic associated with the proposed WTG construction has been assessed in relation to existing traffic flows. The project would add no more than **40%** to the average HGV flows on the A822 on the days when the movements are at their peak. This impact is considered insignificant in both the scale and the duration. This is further considered the conclusion given the figure of less than 2% of the average total traffic flows on the A822.

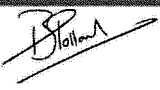
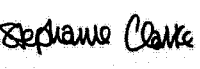
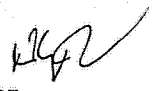
It is recognised that the delivery of the WTG components will require careful thought and planning. Additionally given the nature of the size of these components it is likely that there will be a requirement for a police escort. Each delivery vehicle would follow a pre determined route and the times can be arranged so that minimal disruption is caused to other road users.

Appendix 1 VRI Report

Drummick, Perthshire, Scotland

Visual Route Inspection Rev01

Document Control

Responsible for	Job Title	Name	Date	Signature
Content	Project Manager	Ben Pollard	2011-11-01	
Checked	Development Consultant	Stephanie Clarke	2011-11-17	
Approval	Director of Technical Services	Nick Fleming	2011-11-18	
Copyright:	PMSS ©	Document Reference:	29827	

Signatures in this approval box have checked this document in line with the requirements of QP16

This report has been prepared by Project Management Support Services Ltd with all reasonable skill and care, within the terms of the contract with the Client. The report contains information from sources and data which we believe to be reliable but we have not confirmed that reliability and make no representation as to their accuracy or completeness.

The report is confidential to the Client and Project Management Support Services Ltd accepts no responsibility to any third party to whom information in this report may be disclosed. No part of this document may be reproduced without the prior written approval of Project Management Support Services Ltd

Record of Changes

Revision Number	Date	Page Number	Description	Approved
A	2011-11-04	All	Initial Draft for Review	NKF
B	2011-11-17	8 onwards	Addition of SPANs and amendments to text in light of this information	SCH
C				
D				
E				
F				
G				
0	2011-11-04	All	Client Issue	NKF
1	2011-11-18	All	Client Issue	NKF
2				
3				
4				
5				
6				

Distribution List

#	Function Title	Company	Name (optional)
1	Director	ClearWinds Limited	William Clare
2	Project File 29827	PMSS Ltd	Bath Server
3	Senior Environmental Planner	Pegasus Planning Group	Annabel Roberts
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
Notes:			

Table of Contents

1.	Introduction	15
1.1.	Background	15
1.2.	Point of Contact	15
2.	Scope of Services	16
3.	Proposed Route	17
3.1.	Route Map	17
3.2.	Location	17
3.3.	Route Description Detail	18
3.4.	Site Access	24
4.	Transport and Logistics	25
4.1.	Transport Structure Clearance	25
4.2.	Basic Principles of Transport	25
4.3.	Access Roads	27
4.4.	Bearing Capacity	27
5.	Conclusion	28
	Appendix 2 (of Traffic & Transport Report) – SPAns	30

Figures

Figure 3.1	Proposed Delivery Route from M90 Exit to Drummick Site
Figure 3.2	Location of Drummick Site
Figure 3.3	Proposed Delivery Route from West Huntingtower to Gilmerton
Figure 4.1	Transport Structure Clearance (m)
Figure 4.2	Semi Trailer, Tower Sections
Figure 4.3	Telescopic semi, nacelle components
Figure 4.4	Flatbed trailer, hub
Figure 4.5	8 axle semi, generator
Figure 4.6	Semi trailer, blades

Images

Image: 3.1	Broxden Roundabout
Image: 3.2	A9 (NE) carriageway with central reservation
Image: 3.3	Congestion within the town of Methven
Images: 3.4 / 3.5	Right turn from A85 to A822
Images: 3.6 / 3.7	Sharp left bend on A822
Image: 3.8	Right turn onto B8063
Images: 3.9 / 3.10	Right turn on B8063
Images: 3.11 / 3.12	Straight ahead exit on B8063
Images: 3.13 / 3.14	Right turn on C classified road onto further C classified road
Images: 3.15 / 3.16	Right turn on C classified road onto further C classified road
Image: 3.17	C classified road towards turbine location
Image: 3.18	Site entrance options

Abbreviations

Client	ClearWinds Limited	PP	Pinch Point
HA	Highways Agency	SPAN	Swept Path Analysis
mph	Miles Per Hour	WTG	Wind Turbine Generator
PMSS	Project Management Support Services Ltd		

1. Introduction

1.1. Background

ClearWinds Limited (Client) has requested Project Management Support Services Limited (PMSS) to provide a visual route survey of a plausible transport route for the safe transport of Wind Turbine Generator (WTG) components to the proposed development at Drummick, Perthshire, Scotland.

PMSS understand that the WTGs under consideration for this project are an Enercon E44/48/53 and a Gamesa G52/58; as such PMSS have used a blade length for the larger G58 WTG, at approximately 29m.

1.2. Point of Contact

The point of contact for this document and subsequent correspondence is:

Mr Ben Pollard
Project Manager
Project Management Support Services Ltd
19/20 Charles Parade
Charles Street
Bath Somerset
BA1 1HX

Tel: +44 (0) 1225 489 230
DDI: +44 (0) 1225 489 238
Fax: +44 (0) 1225 466 261
Mob: +44 (0) 7920 770 440
Email: bpo@pmss.com

2. Scope of Services

The objectives of this work are to:

- 1) Visually appraise the local highways to identify a transport route to the proposed Drummick project, and;
- 2) To find an access route to site from the nearest motorway to a site entry point.

The largest WTG component to be transported to site is that of the blade. The overall dimensions of the blade transport vehicle assumed for this visual survey is as follows (please see **Section 4** for full specification of vehicles):

- 33m length
- 4.20m width
- 40t gross weight
- Loaded with a 29m long blade

It is considered that the delivery vehicles could gain access to any point on the UK motorway network, therefore the visual route appraisal will be based from the nearest exit point of the motorway (in this case the M90).

3. Proposed Route

The route considered suitable for the delivery of the WTG components uses the following roads: M90, exit onto the A9 (North East), exit to the A85, turn right onto the A822, turn right onto B8063 continue straight ahead onto a C classified road then turn right onto a further C classified road where site access gain be gained.

3.1. Route Map

The red dashed line on Figure 4.1 shows the proposed route from the exit of the M90 motorway to the entrance of Drummick.

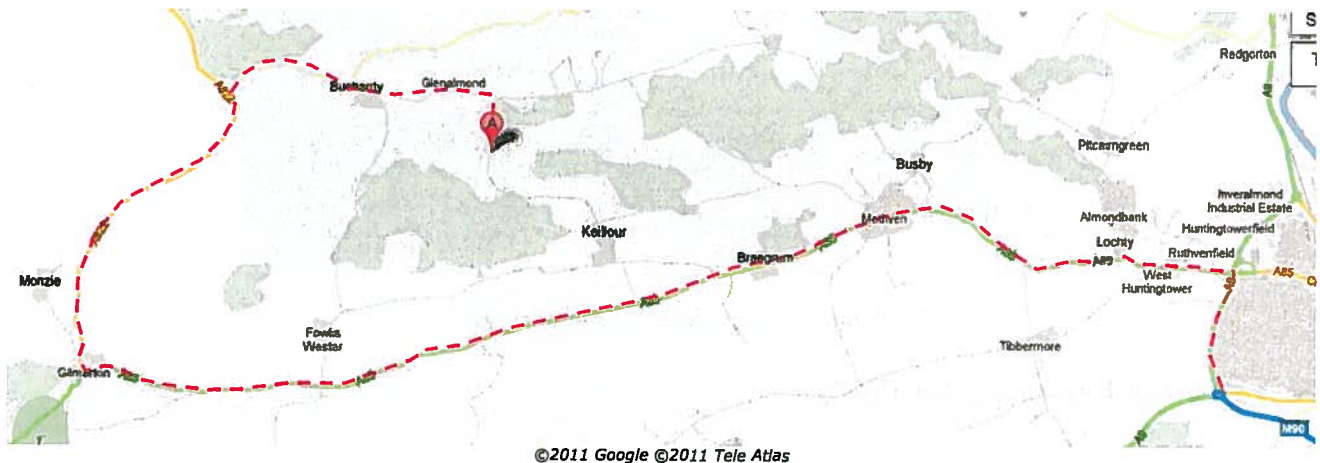


Figure 3.3 Proposed Delivery Route from M90 Exit to Drummick Site

3.2. Location

Drummick is located approximately 16km west of Perth and 88km north west of Edinburgh (Figure 3.2).



Figure 3.4 Location of Drummick Site

3.3. Route Description Detail

The route to the site location begins from the nearest exit on the M90 motorway. Image 3.1 below shows the exit of the M90 at Broxden roundabout with the route continuing north east on the A9 (NE) as indicated with the red arrow.



Image 3.1 Broxden Roundabout

On visual inspection Broxden roundabout was 2 lanes wide (3 in sections) and suitable for the delivery vehicles to pass.

The route continues on the A9 (NE). The A9 (NE) is a dual lane A-classification carriageway with central reservation and speed limit of 70mph.



2011 Google ©2011 DigitalGlobe, GeoEye, Getmapping plc, Map Data ©2011 Tele Atlas

Image 3.2 A9 (NE) carriageway with central reservation

The route exits the A9 (NE) at the A85 junction as shown on the above image. The slip road is taken and the route approaches a small roundabout where an immediate left (first exit) is taken onto the A85.

On visual inspection, the slip road ramp had 2 lanes and the roundabout had sufficient space to allow the passing of the WTG delivery vehicles.



©2011 Google ©2011 Tele Atlas

Figure 3.3 Proposed Delivery Route from West Huntingtower to Gilmerton

The route continues on the A85 in a westerly direction towards the village of Gilmerton, it passes through the villages of West Huntingtower, Methven and Brae-grum.

PMSS noted that the A85 become more congested through the villages and there were instances when cars were parked on both sides of the carriageway allowing only 1 direction of travel. This could be dealt with by the police enforcing parking to one side of the road during the delivery of the

WTG but it is worthy of being conveyed at this point in time. Image 3.3 shows a congested area within the town of Methven.



©2011 Google ©2011 Tele Atlas

Image 3.3 Congestion within the town of Methven

Pinch Point 1

The route exits the A85 via a right hand turn in the village of Gilmerton, enters the A822 and continues north.



(Above left) 2011 Google ©2011 DigitalGlobe, GeoEye, Getmapping plc, Map Data ©2011 Tele Atlas

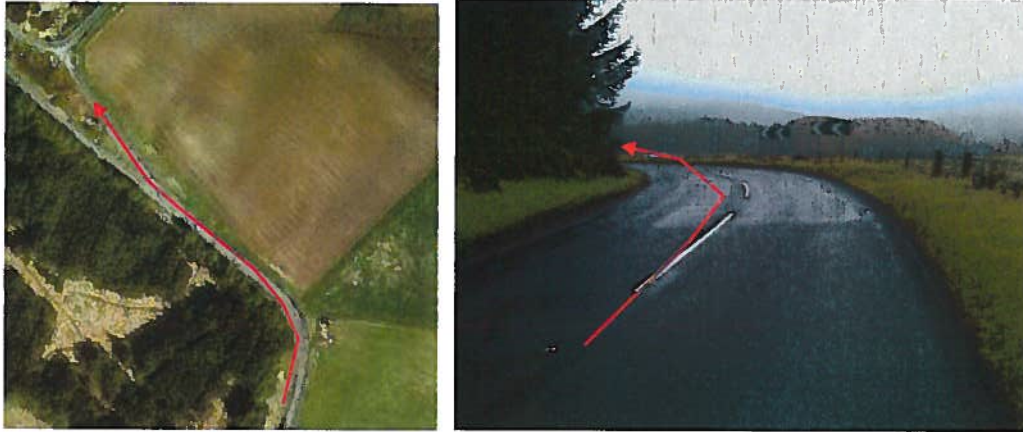
Images 3.4/3.5 Right turn from A85 to A822

On visual inspection, the A85 in this location was a 6.5m wide single lane carriageway and the A822 had an initial bellmouth of 23m which narrowed to a 6.5m wide single lane carriageway. There was a small wall located to the one side of the junction and a row of cottages to the nearside of the turn.

PMSS have undertaken SPAN (Swept Path Analysis) to confirm the suitability of completing this manoeuvre, see SPAN 1 in Appendix 2. SPAN 1 indicates that a total of 25m² of swept area is required outwith the existing carriageway. Liaison with the Highways Agency and Land Registry is suggested to confirm ownership of this land.

Pinch Point 2

The route continues on the A822, which is a single carriageway for approximately 5km, before the route navigates a sharp left hand bend and then exits via a right turn onto the B8063. The A822 is approximately 6m wide through the left hand bend.



(Above left) 2011 Google ©2011 DigitalGlobe, GeoEye, Getmapping plc, Map Data ©2011 Tele Atlas

Images 3.6/3.7 Sharp left bend on A822



Image 3.8 Right turn onto B8063

PMSS have undertaken SPAn to confirm the suitability of completing this manoeuvre, see SPAn 2 in Appendix 2. SPAn 2 indicates that this route is suitable for delivery without any modifications to the current road layout. From initial inspection a SPAn was recommended for the right turn onto the B8063, however from review in the set-up of the Autotrack model it was confirmed that this would not be required and the SPAn was not produced.

Pinch Point 3

The route continues a short distance on the B8063 and then takes a right hand turn, continuing north easterly on the B8063. The bellmouth to this junction was approximately 12m wide and the B8063 reduced to approximately 6m width.



(Above left) 2011 Google ©2011 DigitalGlobe, GeoEye, Getmapping plc, Map Data ©2011 Tele Atlas

Images 3.9/3.10 Right turn on B8063

PMSS have undertaken SPAn to confirm the suitability of completing this manoeuvre, see SPAn 3 in Appendix 2. SPAn 3 indicates that a total of 32m² of swept area is required outwith the existing carriageway. Liaison with the Highways Agency and Land Registry is suggested to confirm ownership. All land-take, if required, is suggested to be taken from the left hand edge prior to the junction. This is due to a dry stone wall on the right hand-side of the turn and lower land on the left side after the junction.

The route continues on the B8063 towards the village of Buchanty, at this point the route exits via a right hand (straight ahead) movement as shown below.



(Above left) 2011 Google ©2011 DigitalGlobe, GeoEye, Getmapping plc, Map Data ©2011 Tele Atlas

Images 3.11/3.12 Straight ahead exit on B8063

On visual inspection PMSS believe this movement could be completed by the WTG transport vehicle. Although given the hairpin left hand bend on the B8063 it would be advised that this area is under strict traffic management during the delivery of the WTG.

The route continues on a C classified road. PMSS noted that the road had some undulation which could result in the WTG delivery vehicle "bottoming out"; this should be assessed when the model of WTG is chosen.

Pinch Point 4

The route continues on the C classified road through Glenalmond and takes a right turn onto a further C classified road.



(Above left) 2011 Google ©2011 DigitalGlobe, GeoEye, Getmapping plc, Map Data ©2011 Tele Atlas

Images 3.13/3.14 Right turn on C classified road onto further C classified road

The C classified road is a single carriageway of approximate 6m width; the bellmouth for the right hand turn was approximately 10m narrowing to a 5m single direction of travel track.



Images 3.15/3.16 Right turn on C classified road onto further C classified road

There was an additional grass verge to the right of the turn and small amount to the far side of the turn (highlighted with red ellipses above). PMSS are also aware that the land owner has a field to the north west of this turning which is likely to be required to complete this turn.

PMSS have undertaken SPAn to confirm the suitability of completing this manoeuvre, see Span 4 in Appendix 2. SPAn 4 indicates that a total of 237m² of swept area is required outwith the existing carriageway. Liaison with the Highways Agency and Land Registry is suggested to confirm ownership.

The route continues south on the C classified road towards the Drummick WTG location. The C classified road is approximately 3m wide and varies to 4m in places, there are several areas along this road that have overhanging trees, these would generally requiring pruning to achieve a clearance of 5m by 5m.



Image 3.17 C classified road towards turbine location

3.4. Site Access

The site can be accessed from the C classified road.



2011 Google ©2011 DigitalGlobe, GeoEye, Getmapping plc, Map Data ©2011 Tele Atlas

Image 3.18 Site entrance options

There are two access points to consider, one is prior to the "S" bend and the second continues on the road and enters the site via an existing gateway.

PMSS suggest that the site is accessed before the "S" bend in the C classified road and continue south before following an existing dirt track to the WTG location. This option is preferred as the road through the "S" bend would require upgrading to allow the WTG vehicles to pass.

From this point the route enters the on-site access track that leads to the WTG location.

4. Transport and Logistics

Wind WTG manufacturers set out minimum requirements for the successful delivery of WTG's. Below are the basic requirements for a WTG of the size under consideration for Drummick.

4.1. Transport Structure Clearance

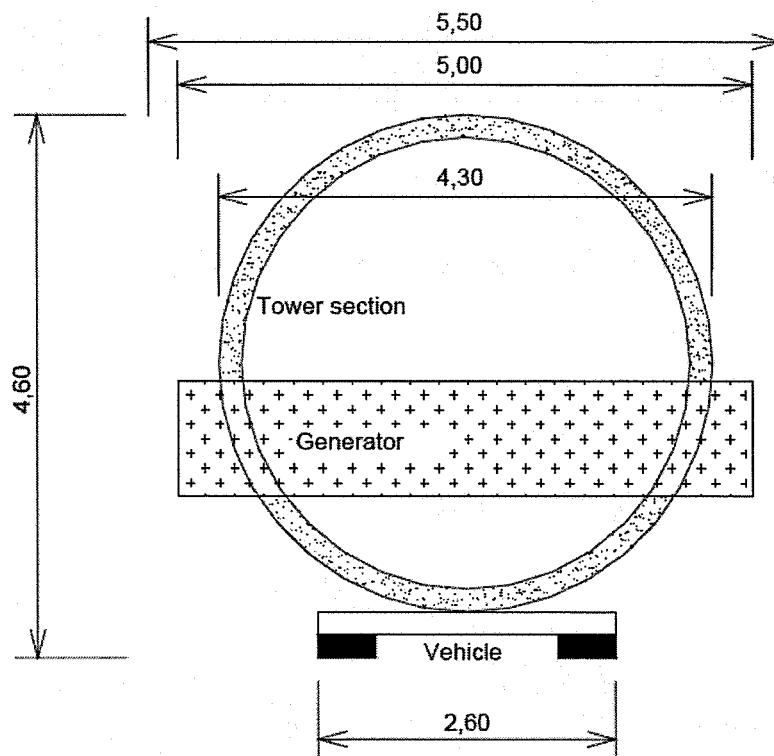


Figure 4.1 Transport Structure Clearance (m)

4.2. Basic Principles of Transport

It is a basic principle that transport vehicles should not exceed the maximum axle load of 12-13t. This is the typical limit for 'normal' heavy goods vehicles. Thus, a transport vehicle with an actual overall weight of 120t has to have at least 10 axles, given an even distribution of weight.

The following vehicles are used for delivery of WTG Components:

- Low loader trailers
- Drop base vehicles
- Semi trailers and
- Adapter vehicles

The vehicles vary to some extent in terms of length and width and can be shortened by several metres once they have been unloaded. Please note the vehicles are for illustration purposes only and axle numbers and spacing varies dependent on the selected haulier.

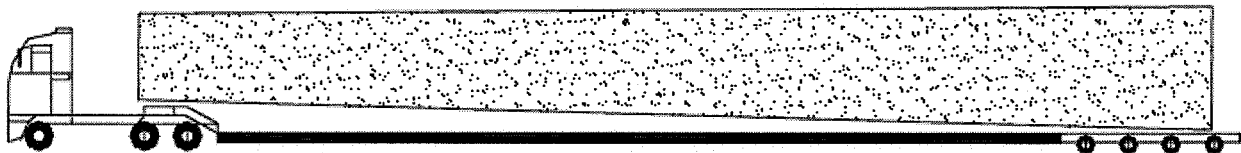


Figure 4.2 – Semi Trailer, Tower Sections

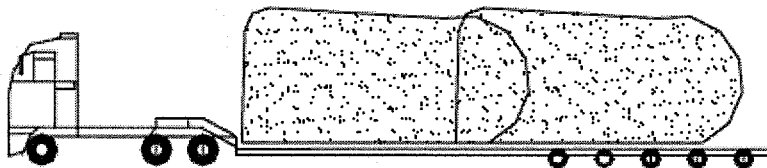


Figure 4.3 - Telescopic semi, nacelle components

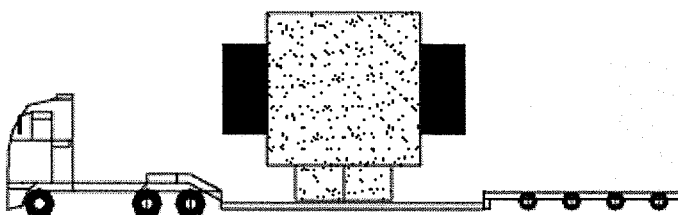


Figure 4.4 - Flatbed trailer, hub

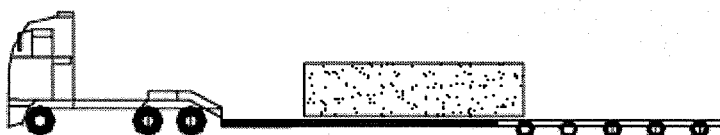


Figure 4.5 - 8 axle semi, generator



Figure 4.6 - Semi trailer, blades

Table 4.1 – Vehicle Capacity and Facilities

Vehicle	Capacity	Facility
Semi trailer	18-65 Te	12.2-38m Double extendable
Telescopic semi	22-135 Te	From 3 to 8 axles 13-25m loads
Flatbed	20-125 Te	From 2-14 axles 8.5-17m loads
8 axle semi	20-125 Te	From 2-14 axles 8.5-17m loads

4.3. Access Roads

Any roadways, bridges or access roads have to be able to withstand the transportation of heavy loads up to a maximum axle load of 12t and a maximum overall weight of 120t. All over bridges will need to be checked for load capacity.

Table 4.2 – Access Road Capacity Requirements

Item	Value
Useful width of carriageway	4m
Clearance width	5m
Radius of curve, external	28m
Incline on loose surface	7%
Incline with fixed surface (concrete, tarmac)	12%
Ground clearance of transport vehicles	0.15m

4.4. Bearing Capacity

The road structure needs to withstand the exertion of the heaviest vehicle, in this case the generator vehicle, which weighs 118t when fully loaded. The road load bearing capacity must be a minimum of 150 nominal kN/m², which is within the acceptable limits for conventional heavy goods vehicles.

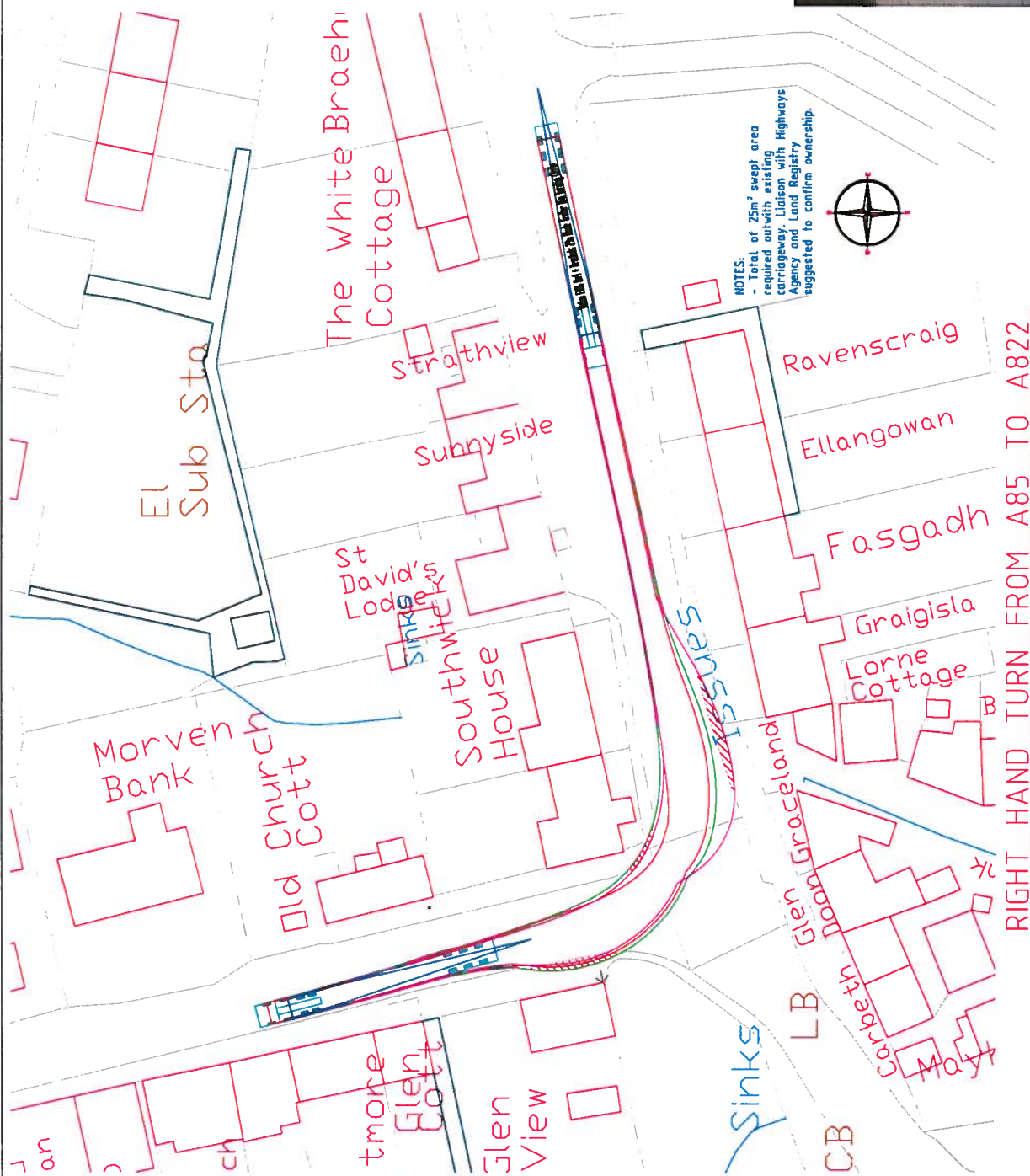
5. Conclusion


This visual route inspection has identified a suitable route to Drummick which has been subject to some further investigation of five pinch points; with four resultant SPAn produced as shown in Appendix 2 of this Traffic and Transport Report.

The most suitable access point to the site is direct from the C classified road, subject to agreement with the land owner.

Appendix 2: Swept Path Analysis (SPAn)

1.	SWEPT PATH ANALYSIS BASED SOLELY ON OS/MasterMap DATA.
2.	NO 'ON-SITE' VERIFICATION OF THE OS DATA HAS BEEN PERFORMED.
3.	ANALYSIS BASED ON A WIND TURBINE GENERATOR WITH A 29 METRE BLADE.
4.	WHILST EVERY EFFORT HAS BEEN MADE TO ACCURATELY REPRODUCE VEHICLE CHARACTERISTICS IN ALL INSTANCES, PLEASE BE AWARE THAT THE AUTOTRACK SOFTWARE IS NOT ABLE TO REPLICATE INDEPENDENTLY CONTROLLED REAR-WHEEL STEERING, AND AS SUCH, RESULTS ARE LIKELY TO REPRESENT A WORST-CASE. PLEASE NOTE THAT THE MANUFACTURER OF AUTOTRACK GIVES NO WARRANTY AS TO THE RESULTS OR PERFORMANCE OF THIS SOFTWARE.
5.	ANALYSIS IS SUBJECT TO FINAL CONFIRMATION BY HAULAGE CONTRACTOR.
6.	TYPICAL TRUCK AND TRAILER PARAMETERS HAVE BEEN UTILISED, WHICH MAY VARY BETWEEN TRANSPORT CONTRACTORS.
7.	ANALYSIS BASED ON AUTOMATIC REAR STEER SETTINGS.
8.	AREA WITHIN GREEN OUTLINE WILL BE OVERSALLED BY TRAILER BED AND PROJECTIONS.
9.	AREA WITHIN MAGENTA OUTLINE WILL BE OVERSALLED BY LOAD AND PROJECTIONS.
10.	AREA WITHIN RED OUTLINE WILL BE SWEEP BY TRACTOR AND TRAILER AXLES.
11.	AREA WITHIN RED DOTTED HATCH REPRESENTS AREA OF LAND TAKE REQUIRED OUTSIDE OF EXISTING METALLED SWEEP INCLUDING OVERSAIL.
12.	WHERE SWEEP PATH RUNS THROUGH PEDESTRIAN FOOTPATHS; FOOTPATH TO BE PREPARED TO ACCEPT SUITABLE AXLE LOADS.
13.	OBSTRUCTING STREET FURNITURE TO BE REMOVED ALONG THE ROUTE.
14.	WHERE PATHS OVERRUN EXISTING ROAD INFRASTRUCTURE, GROUND TO BE LEVELLED AND REINFORCED AS NEEDED TO ACCEPT AXLE LOADINGS.
15.	ALL HEDGES, SHRUBS, BUSHES, TREES AND OTHER OVERHANGING BRANCHES ALONG ROUTE ON SITE MUST BE TRIMMED TO ALLOW A MINIMUM ENVELOPE ON THE ROAD OF 5.0 METRES WIDE BY 5.0 METRES HIGH.



<div><div>PMSS</div></div> <div>Do not scale this drawing. PMSS to be notified of any discrepancies on this drawing. Contractors must check all dimensions on site, prior to commencement of any work. This drawing is copyright.</div>	Project	DRUMMICK ACCESS STUDY			Drawing Title					
	Client	CLEARWINDS			Project No.	29827	Drawing No.			
							Revision			
					Revision Description			Rev	By	Date
					Drawn: JSN			Designed: SHC	Checked: NKF	
					Scale @ A3 size:			1:500	Date:	15th Nov 2011

230.1m

LEFT HAND BEND ON A822

- 230.13



LEFT HAND BEND ON A822

SCALE 1:600



PMSS

Project	Do not scale this drawing. PMSS to be notified of any discrepancies on this drawing. Contractors must check all dimensions on site, prior to commence of any work. This drawing is copyright.
Client	

DRUMMICK ACCESS STUDY

CLEARWINDS

Swept Path Analysis Pinch Point 2

Pinch Poir
Drawing No.

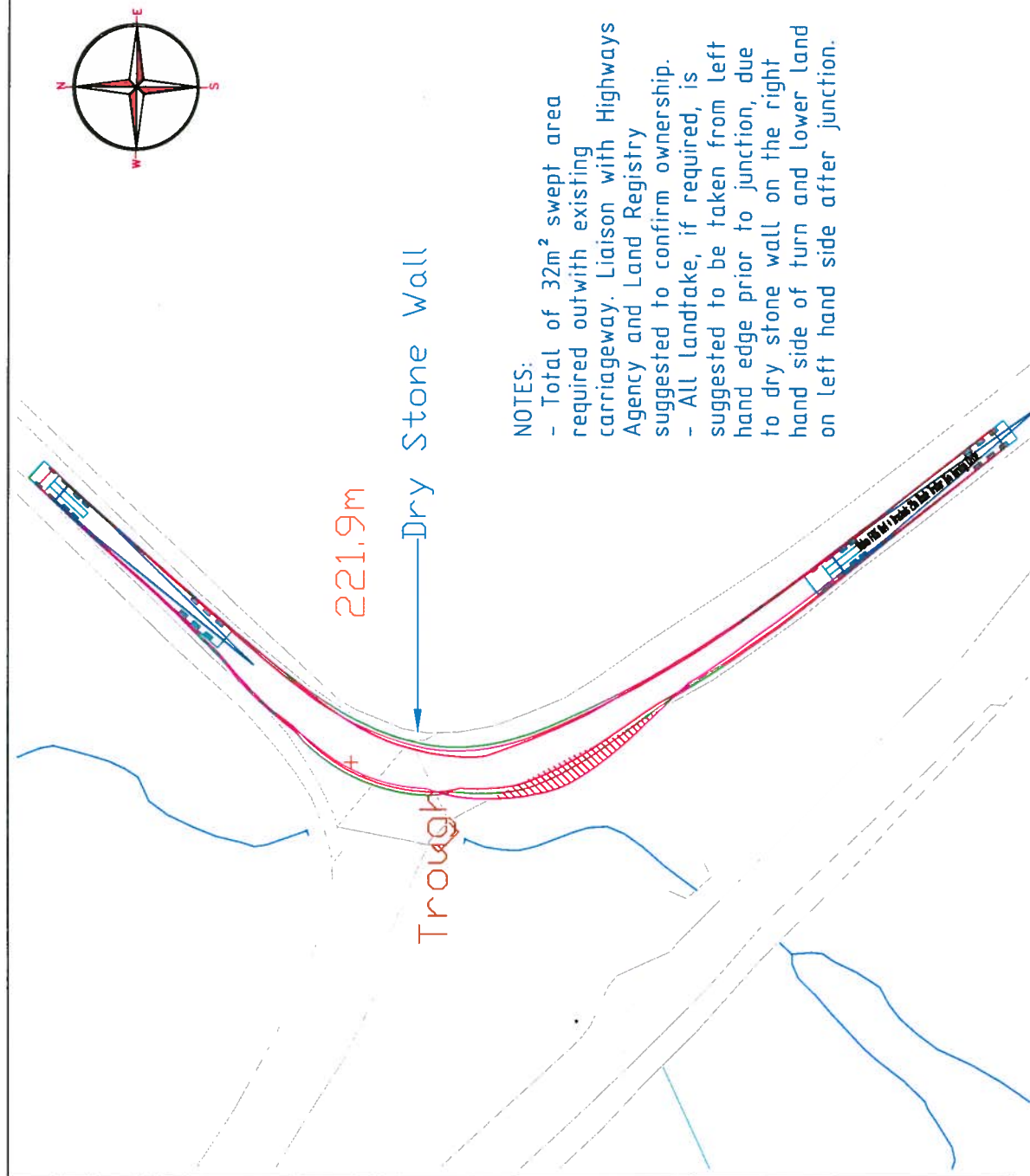
Project No. 29827

UC

Revision	Description
1	Initial release

Drawn: JSN	Desl
Scale @ A3 size:	1:600

Checked: NKF
Date: 15th Nov 2011




NOTES:

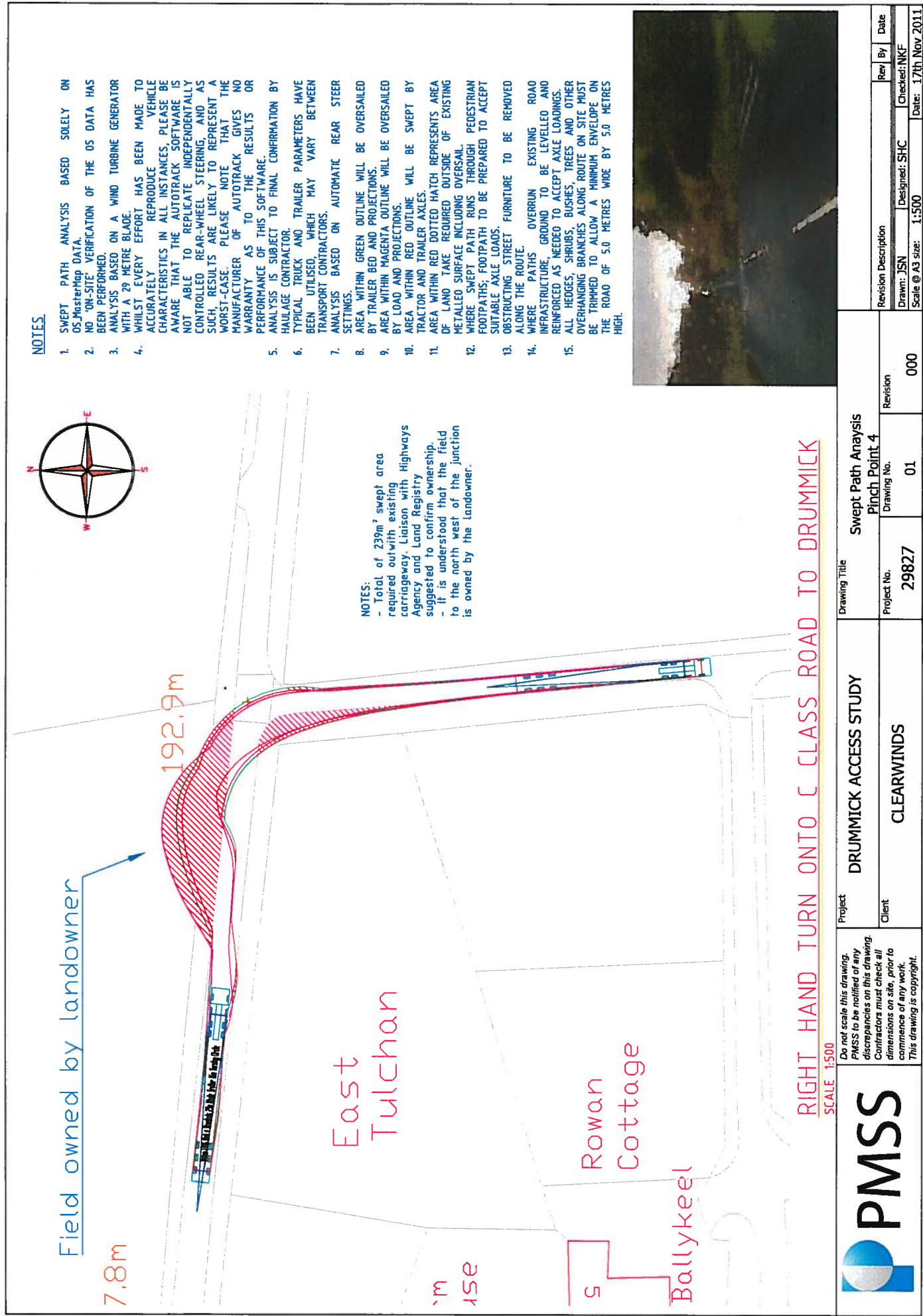
- Total of 32m² swept area required outwith existing carriageway. Liaison with Highways Agency and Land Registry suggested to confirm ownership.
- All landtake, if required, is suggested to be taken from left hand edge prior to junction, due to dry stone wall on the right hand side of turn and lower land on left hand side after junction.

NOTES

1. SWEEP PATH ANALYSIS BASED SOLELY ON OS MasterMap DATA.
2. NO 'ON-SITE' VERIFICATION OF THE OS DATA HAS BEEN PERFORMED.
3. ANALYSIS BASED ON A WIND TURBINE GENERATOR WITH A 29 METRE BLADE.
4. WHILST EVERY EFFORT HAS BEEN MADE TO ACCURATELY REPRODUCE VEHICLE CHARACTERISTICS IN ALL INSTANCES, PLEASE BE AWARE THAT THE AUTOTRACK SOFTWARE IS NOT ABLE TO REPLICATE INDEPENDENTLY CONTROLLED REAR-WHEEL STEERING, AND AS SUCH, RESULTS ARE LIKELY TO REPRESENT A WORST-CASE. PLEASE NOTE THAT THE MANUFACTURER OF AUTOTRACK GIVES NO WARRANTY AS TO THE RESULTS OR PERFORMANCE OF THIS SOFTWARE.
5. ANALYSIS IS SUBJECT TO FINAL CONFIRMATION BY HAULAGE CONTRACTOR.
6. TYPICAL TRUCK AND TRAILER PARAMETERS HAVE BEEN UTILISED, WHICH MAY VARY BETWEEN TRANSPORT CONTRACTORS.
7. ANALYSIS BASED ON AUTOMATIC REAR STEER SETTINGS.
8. AREA WITHIN GREEN OUTLINE WILL BE OVERSAILED BY TRAILER BED AND PROJECTIONS.
9. AREA WITHIN MAGENTA OUTLINE WILL BE OVERSAILED BY LOAD AND PROJECTIONS.
10. AREA WITHIN RED OUTLINE WILL BE SWEEP BY TRACTOR AND TRAILER AXLES.
11. AREA WITHIN RED DOTTED HATCH REPRESENTS AREA OF LAND TAKE REQUIRED OUTSIDE OF EXISTING METALLED SURFACE INCLUDING OVERSAIL.
12. WHERE SWEEP PATH RUNS THROUGH PEDESTRIAN FOOTPATHS, FOOTPATH TO BE PREPARED TO ACCEPT SUITABLE AXLE LOADS.
13. OBSTRUCTING STREET FURNITURE TO BE REMOVED ALONG THE ROUTE.
14. WHERE PATHS OVERRUN EXISTING ROAD INFRASTRUCTURE GROUND TO BE LEVELLED AND REINFORCED AS NEEDED TO ACCEPT AXLE LOADINGS.
15. ALL HEDGES, SHRUBS, BUSHES, TREES AND OTHER OVERHANGING BRANCHES ALONG ROUTE ON SITE MUST BE TRIMMED TO ALLOW A MINIMUM ENVELOPE ON THE ROAD OF 5.0 METRES WIDE BY 5.0 METRES HIGH.



 PMSS	<p>Do not scale this drawing. PMSS to be notified of any discrepancies on this drawing. Contractors must check all dimensions on site, prior to commencement of any work. This drawing is copyright.</p>	Project	DRUMMICK ACCESS STUDY		Drawing Title						
		Client	CLEARWINDS		Project No.	29827	Drawing No.	01	Revision	001	
										Revision Description	
				Drawn: JSN	Designed: SHC		Checked: NKF		Rev	By	Date
				Scale @ A3 size: 1:500		Date: 17th Nov 2011					




Appendix 3 AADT Measurement Point

Department for
Transport

[Information charter](#) | [Accessibility](#) | [Contact us](#) | [Help](#) | [Site map](#)

[Home](#)
[Data Definitions](#)
[Search](#)
[Interactive Map](#)
[Contact Us](#)
[Help](#)



[Navigate](#)
[Search](#)
[Map Layers](#)

All data shown are for 2010

LAYER	VISIBLE
Road Network	<input type="checkbox"/>
Schematic network associated with the count sites - Primary Route Network (PRN) of major roads	<input type="checkbox"/>
Schematic network associated with the count sites - non PRN of major roads	<input type="checkbox"/>
Mapping Display	
Background Mapping	<input checked="" type="checkbox"/>
Local Authority Boundaries	<input type="checkbox"/>
Parliamentary Constituency Boundaries	<input type="checkbox"/>
London Congestion Zone	<input type="checkbox"/>
Count Points	<input checked="" type="checkbox"/>
Location of Traffic Count Sites	<input type="checkbox"/>
Label at traffic count point -	<input type="checkbox"/>
Count Point Number	<input type="checkbox"/>
AADF (number of all motor vehicles)	<input type="checkbox"/>
AADF by Vehicle Type (number of vehicles)	
Car	<input type="checkbox"/>
Bus	<input type="checkbox"/>
LGV	<input type="checkbox"/>
HGV	<input type="checkbox"/>
2WMV	<input type="checkbox"/>
P/C	<input type="checkbox"/>
Traffic Volume (All motor vehicles Thousand Vehicle Kms)	
<input type="checkbox"/>	<input type="checkbox"/>
Traffic Volume by Vehicle Type (Thousand Vehicle Kms)	
Car	<input type="checkbox"/>
Bus	<input type="checkbox"/>
LGV	<input type="checkbox"/>
HGV	<input type="checkbox"/>
2WMV	<input type="checkbox"/>
P/C	<input type="checkbox"/>

Broadwater House
Broadwater Road
Romsey
Hampshire
SO51 8GT

Tel: +44 (0)1794 526 560
Fax: +44 (0)1794 516 826
Email: enquiry@pmss.co.uk

PMSS Hampshire Ltd is a private limited company
registered in England and Wales
Registered Office: Broadwater Road, Romsey, Hampshire, SO51 8GT

HAYES MCKENZIE

PARTNERSHIP LTD



Prepared for:

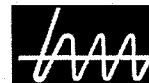
*ClearWinds Ltd
Old Orchard
East Harting
Hants
GU315NE*

Drummick Wind Turbine

**Environmental Noise Assessment
HM: 2475/R1**

22nd November 2011

Unit 3, Oakridge Office Park, Whaddon, Salisbury SP5 3HT, UK
Tel. +44 (0)1794 342343, Fax +44 (0)1794 342344, salisbury@hayesmckenzie.co.uk
●Offices in Salisbury & Machynlleth●



**DRUMMICK WIND TURBINE
ENVIRONMENTAL NOISE ASSESSMENT**

Report HM : 2475/R1

22nd November 2011

Prepared by: Robin Woodward BSc, AMIoA
Checked by: Rob Shepherd MEng, MIoA, AMIMechE
Approved by: Andy McKenzie PhD, BSc, FIOA



1. INTRODUCTION

- 1.1 A single wind turbine development has been proposed on land approximately 10 miles west of Perth, Perth and Kinross. The developer has commissioned this noise assessment to consider the impact of the scheme on the surrounding area and in particular on nearby residential properties.
- 1.2 The assessment has been carried out according to the recommendations of ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*, as referred to in PAN 1/2011, *Planning and Noise*, as the method by which noise from wind farms should be assessed, as well as the Institute of Acoustics (IoA) Acoustics Bulletin Vol 34 no. 2 article *Prediction and Assessment of Wind Turbine Noise*.
- 1.3 Predicted noise levels, based on the use of an Enercon E53 800 kW turbine with a hub height of 50 metres and noise data provided by the manufacturer, have been compared with proposed noise limits contained within ETSU-R-97.
- 1.4 Due to the location of the scheme, and the consequent low levels of predicted noise at the nearest residential properties, baseline noise measurements are not required for the ETSU-R-97 assessment. Predicted noise levels have been compared with the simplified noise limit which applies in such situations.

2. NOISE FROM WIND FARM DEVELOPMENTS

- 2.1 Noise is generated by wind turbines as they rotate to generate power. This only occurs above the 'cut-in' wind speed and below the 'cut-out' wind speed. Below the cut-in wind speed there is insufficient strength in the wind to generate efficiently and above the cut-out wind speed the turbine is automatically shut down to prevent any malfunctions from occurring. The cut-in speed at turbine hub height for the Enercon E53 800 kW is 3 metres per second (m/s) and the cut out wind speed is between 28 and 34m/s.
- 2.2 The principal sources of noise are from the blades rotating in the air (aerodynamic noise) and from internal machinery, normally the gearbox (if the machine is not a direct drive model, as is the case here) and, to a lesser extent, the generator (mechanical noise). The blades are carefully designed to minimize noise whilst optimising power transfer from the wind.



Noise in the Environment

- 2.3 Although the source noise levels are fairly low, wind farms are generally situated in rural environments where there are few other sources of noise. When wind speeds are high this is not a problem since any noise is masked by wind induced noise effects, particularly that of the trees being blown. At lower wind speeds, however, or in particularly sheltered locations, the wind induced background noise may not be sufficient to mask any noise from the turbines. However, under these conditions, the generated noise levels may be so low as to generate very little impact.
- 2.4 Noise levels are normally expressed in decibels. Noise in the environment is measured using the dB(A) scale which includes a correction for the response of the human ear to noises with different frequency content. Planning Advice Note PAN1/2011 [1] (Scottish Government, 2011) states that 'For noise of a similar character, a change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving and doubling the loudness of a sound'. Table 1 shows noise from wind turbines in the general context of noise in the environment.

Table 1 - Examples of Indicative Noise Levels¹

Source/Activity	Indicative noise level, dB (A)
Unsilenced pneumatic drill (at 7m distance)	95
Heavy diesel lorry (40km/h at 7m distance)	83
Modern twin-engine jet (at take-off at 152m distance)	81
Passenger car (60 km/h at 7m distance)	70
Office environment	60
Ordinary conversation	50
Quiet bedroom	35

¹ Taken from PAN 1/2011, *Planning and Noise* [1]



3. NOISE PLANNING GUIDANCE

Planning Advice Note PAN1/2011, Planning and Noise

- 3.1 PAN1/2011 identifies two sources of noise from wind turbines; mechanical noise and aerodynamic noise. It states that *'good acoustical design and siting of turbines is essential to minimise the potential to generate noise'*. It refers to the *'web based planning advice'* on renewables technologies for onshore wind turbines.

Web Based Planning Advice, Onshore Wind Turbines

- 3.2 The web based planning advice on onshore wind turbines [2] re-iterates the sources of noise as *'the mechanical noise produced by the gearbox, generator and other parts of the drive train and the aerodynamic noise produced by the passage of the blades through the air'* and that *'there has been significant reduction in the mechanical noise generated by wind turbines through improved turbine design'*. It states that *'the Report, "The Assessment and Rating of Noise from Wind Farms" (Final Report, Sept 1996, DTI), (ETSU-R-97), describes a framework for the measurement of wind farm noise, which should be followed by applicants and consultees, and used by planning authorities to assess and rate noise from wind energy developments, until such time as an update is available'*. It notes that *'this gives indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable burdens on wind farm developers, and suggests appropriate noise conditions'*.

ETSU-R-97, The Assessment and Rating of Noise from Wind Farms

- 3.3 ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms* [3], presents the recommendations of the Working Group on Noise from Wind Turbines, set up in 1993 by the Department of Trade and Industry (DTI) as a result of difficulties experienced in applying the noise guidelines existing at the time to wind farm noise assessments. The group comprised independent experts on wind turbine noise, wind farm developers, DTI personnel and local authority Environmental Health Officers. In September 1996 the Working Group published its findings by way of report ETSU-R-97. This document describes a framework for the measurement of wind farm noise and contains suggested noise limits, which were derived with reference to existing standards and guidance relating to noise emission from various sources.



- 3.4 ETSU-R-97 recommends that, although noise limits should be set relative to existing background, and should reflect the variation of both turbine and background noise with wind speed, this can imply very low noise limits in particularly quiet areas, in which case *'it is not necessary to use a margin above background in such low-noise environments. This would be unduly restrictive on developments which are recognised as having wider global benefits. Such low limits are, in any event, not necessary in order to offer a reasonable degree of protection to the wind farm neighbour'*.
- 3.5 For day-time periods, the noise limit is 35-40 dB(A) or 5 dB(A) above the 'quiet day-time hours' prevailing background noise, whichever is the greater. The actual value within the 35-40 dB(A) range depends on the number of dwellings in the vicinity; the effect of the limit on the number of kWh generated; and the duration of the level of exposure.
- 3.6 For night-time periods the noise limit is 43 dB(A) or 5 dB(A) above the prevailing night-time hours background noise, whichever is the greater. The 43 dB(A) lower limit is based on a sleep disturbance criteria of 35 dB(A) with an allowance of 10 dB(A) for attenuation through an open window and 2 dB(A) subtracted to account for the use of L_{A90} rather the L_{Aeq} . It is stated that the $L_{A90,10min}$ noise descriptor should be adopted for both background and wind farm noise levels and that, for the wind farm noise, this is likely to be between 1.5 and 2.5 dB less than the L_{Aeq} measured over the same period. The $L_{Aeq,t}$ is the equivalent continuous 'A' weighted sound pressure level occurring over the measurement period t . It is often used as a description of the average noise level. Use of the L_{A90} descriptor for wind farm noise allows reliable measurements to be made without corruption from relatively loud, transitory noise events from other sources.
- 3.7 Where the occupier of a property has some financial involvement with the wind farm, the day and night-time lower noise limits are increased to 45 dB(A) and consideration can be given to increasing the permissible margin above background. These limits are applicable up to a wind speed of 12 m/s measured at 10 m height on the site.
- 3.8 Quiet day-time periods are defined as evenings from 1800-2300 plus Saturday afternoons from 1300-1800 and Sundays from 0700-1800. Night-time is defined as 2300-0700. The prevailing background noise level is set by calculation of a best fit curve through values of background noise plotted against wind speed as measured during the appropriate time period with background noise measured in terms of $L_{A90,t}$. The $L_{A90,t}$ is the noise level which is exceeded for



90% of the measurement period 't'. It is recommended that at least 1 week's worth of measurements is required.

- 3.9 Where predicted noise levels are low at the nearest residential properties, as is the case here, a simplified noise limit can be applied, such that noise is restricted to the minimum ETSU-R-97 level of 35 dB L_{A90} for wind speeds up to 10 m/s at 10 m height. This removes the need for extensive background noise measurements for smaller or more remote schemes.
- 3.10 It is stated that the $L_{A90,10min}$ noise descriptor should be adopted for both background and wind farm noise levels and that, for the wind farm noise, this is likely to be between 1.5 and 2.5 dB less than the $L_{Aeq,t}$ measured over the same period. The $L_{Aeq,t}$ is the equivalent continuous 'A' weighted sound pressure level occurring over the measurement period t. It is often used as a description of the average noise level. Use of the L_{A90} descriptor for wind farm noise allows reliable measurements to be made without corruption from relatively loud, transitory noise events from other sources.
- 3.11 ETSU-R-97 also specifies that a penalty should be added to the predicted noise levels, where any tonal component is present. The level of this penalty is described and is related to the level by which any tonal components exceed audibility.
- 3.12 With regard to multiple windfarms in a given area ETSU-R-97 specifies that the absolute noise limits and margins above background should relate to the cumulative effect of all wind turbines in the area contributing to the noise received at the properties in question. Existing wind farms should therefore be included in cumulative predictions of noise level for proposed wind turbines and not considered as part of the prevailing background noise.

IoA Bulletin Article, Prediction and Assessment of Wind Turbine Noise

- 3.13 Institute of Acoustics Bulletin Vol 34 no. 2 [4] contains an agreement, jointly authored by a number of consultants working in the wind turbine sector for developers, local authorities and third parties, on an agreed methodology for addressing issues not covered by ETSU-R-97. This includes an agreed method for noise predictions which will be referred to in the relevant section below.



Blade Swish (Aerodynamic Modulation)

- 3.14 The noise limits prescribed in ETSU-R-97 take into account the fact that all wind turbines exhibit the character of noise described as blade swish, to a certain extent. DTI Report W/45/00656/00/00, *The Measurement of Low Frequency Noise at Three UK Windfarms* [5], concluded that *'the common cause of complaints associated with noise at all three wind farms is not associated with low frequency noise, but is the audible modulation of the aerodynamic noise, especially at night'*. It suggests that *'it may be appropriate to re-visit the issue of aerodynamic modulation (AM) and the means by which it should be assessed'*.
- 3.15 As a result, Salford University recently carried out a study, jointly commissioned by Defra, BERR (formerly the DTI) and the CLG, to investigate AM of wind turbine noise. The results were published by way of report NANR233, *Research into Aerodynamic Modulation of Wind Turbine Noise* [6], which concluded that AM was only considered to be a factor at 4, and at a possible further 8, of the 133 sites (all the sites in the UK operational at the time of the study) considered. At these 4 sites, it was considered that conditions associated with AM might occur between about 7 and 15% of the time. In a statement accompanying the published report, the Government states that it *'continues to support the approach set out in Planning Policy Statement (PPS) 22 – Renewable Energy. This approach for local planning authorities to ensure that renewable energy developments have been located and designed in such a way to minimise increases in ambient noise levels, through the use of the 1997 report by ETSU to assess and rate noise from wind energy developments'*.
- 3.16 Although the mechanisms which cause amplitude modulation effects are not completely understood there appear to be certain factors which would appear to make high levels of aerodynamic modulation more likely. These include a close separation distance between turbines sited in a line, especially where such a line points towards residential properties; unusual topography, such as turbines situated on an escarpment or sheltered by the landscape; and turbines on towers shorter than would normally be specified for a given rotor diameter.

Infrasound

- 3.17 Infra-sound is defined as noise occurring at frequencies below that at which sound is normally audible, i.e. at less than 20 Hz, due to the significantly reduced sensitivity of the ear at such frequencies. In this frequency range, for sound to be perceptible, it has to be at a very high



amplitude and it is generally considered that when such sounds are perceptible then they can cause considerable annoyance.

- 3.18 Wind turbines have been cited by some as producers of infra-sound. This has, however, been due to the high levels of such noise, as well as audible low frequency thumping noise, occurring on older 'downwind' turbines of which many were installed in the USA prior to the large scale take up of wind power production in the UK. Downwind turbines are configured with the blades downwind of the tower such that the blades pass through the wake left in the wind stream by the tower resulting in a regular audible thump, with infra-sonic components, each time a blade passes the tower. Virtually all modern turbines, including this proposed turbine, are of the upwind design; that is with the blades up wind of the tower, such that this effect is eliminated.
- 3.19 The DTI Low Frequency Noise Study referred to in Paragraph 3.14 concluded that *'infrasound noise emissions from wind turbines are significantly below the recognised threshold of perception for acoustic energy within this frequency range. Even assuming that the most sensitive members of the population have a hearing threshold which is 12 dB lower than the median hearing threshold, measured infrasound levels are well below this criterion'*. It goes on to state that, based on information from the World Health Organisation, *'there is no reliable evidence that infrasound below the hearing threshold produce physiological or psychological effects'* and that *'it may therefore be concluded that infrasound associated with modern wind turbines is not a source which may be injurious to the health of a wind farm neighbour'*.

Low Frequency Noise

- 3.20 Noise from modern wind turbines is essentially broad band in nature in that it contains similar amounts of noise energy in all frequency bands from low to high frequency. As distance from a wind farm site increases the noise level decreases as a result of the spreading out of the sound energy but also due to air absorption which increases with increasing frequency. The means that although the energy across the whole frequency range is reduced, higher frequencies are reduced more than lower frequencies with the effect that as distance from the site increases the ratio of low to high frequencies also increases. This effect may be observed with road traffic noise or natural sources such as the sea where higher frequency components are diminished relative to lower frequency components at long distances. At such distances, however, overall noise level is so low, particularly for single turbine sites, that any bias in the frequency spectrum is insignificant.



4. NOISE PREDICTIONS

- 4.1 Noise predictions have been carried out using International Standard ISO 9613, *Acoustics – Attenuation of Sound During Propagation Outdoors*. The propagation model described in Part 2 of this standard [7] provides for the prediction of sound pressure levels based on either short-term downwind (ie. worst case) conditions or long term overall averages. Only the worst-case downwind condition has been considered in this assessment, that is - for wind blowing from the proposed turbine towards the nearby houses. When the wind is blowing in opposite direction noise levels will be significantly lower, especially where there is any shielding between the turbine and the houses.
- 4.2 The ISO propagation model calculates the predicted sound pressure level by taking the source sound power level for each turbine in separate octave bands and subtracting a number of attenuation factors according to the following:

$$\text{Predicted Octave Band Noise Level} = \\ L_w + D - A_{\text{geo}} - A_{\text{atm}} - A_{\text{gr}} - A_{\text{bar}} - A_{\text{misc}}$$

These factors are discussed in detail below. The predicted octave band levels from the turbine are summed together to give the overall 'A' weighted predicted sound level.

L_w - Source Sound Power Level

- 4.3 The power level of a noise source is normally expressed in dB re:1pW. Noise predictions are based on provided sound power levels for the proposed Enercon E53 800 kW turbine. It is possible to operate this variable speed turbine in a number of different reduced power modes whereby the maximum noise output is reduced by 'capping' the power output by, in turn, restricting the rotational speed. These predictions have been carried out assuming the turbines are operating un-restricted, with sound power level values as shown in Table 2 taken from Enercon data provided at Appendix A. It should be noted that the 1 dB safety factor recommended has not been applied here and will be taken into account when comparing the results of predictions with the applicable noise limits in Section 5.



Table 2 – Enercon E53 Turbine Source Sound Power Levels

Standardised* 10m Height Wind Speed (m/s)	Sound Power Level (dB L _{WAeq})
5	93.7
6	97.2
7	99.7
8	101.3
9	102.5
10	102.5

* Wind speed corrected from hub height to 10m height assuming ground roughness of 0.05m.

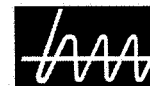
- 4.4 The ETSU-R-97 noise limits assume that the wind turbine noise contains no audible tones. Where tones are present, a correction should be added to the measured or predicted noise level before comparison with the recommended limits. The audibility of any tones can be assessed by comparing the narrow band level of such tones with the masking level contained in a band of frequencies around the tone called the critical band. The ETSU-R-97 recommendations suggest a tone correction, which depends on the amount by which the tone exceeds the audibility threshold.
- 4.5 The octave band noise spectrum used for the noise predictions is shown in Table 3, taken from the mean of three measurements at wind speeds of 9 m/s, carried out by Muller-BBM [8], normalised to an overall sound power level of 102.5 dB(A) L_{WAeq}; the highest noise level occurring for wind speeds up to 10 m/s.

Table 3 - Octave Band Noise Spectrum for 10m Height Wind Speed of 9 m/s

Octave Band Centre Frequency (Hz)	63	125	250	500	1k	2k	4k	8k
Octave Band Sound Power Level (dB(A))	83.4	90.4	92.8	94.7	97.6	96.5	90.3	80.8

D – Directivity Factor

- 4.6 The directivity factor allows for an adjustment to be made where the sound radiated in the direction of interest is higher than that for which the sound power level is specified. In this case the sound power level is measured in a downwind direction, corresponding to the worst case propagation conditions considered here and needs no further adjustment.



A_{geo} – Geometrical Divergence

- 4.7 The geometrical divergence accounts for spherical spreading in the free-field from a point sound source resulting in an attenuation depending on distance according to:

$$A_{\text{geo}} = 20 \times \log(d) + 11$$

where d = distance from the turbine

The wind turbine may be considered as a point source beyond distances corresponding to one rotor diameter.

A_{atm} - Atmospheric Absorption

- 4.8 The atmospheric absorption accounts for the frequency dependant linear attenuation with distance of sound power over the frequency spectrum according to:

$$A_{\text{atm}} = d \times \alpha$$

where α = the atmospheric absorption coefficient of the relevant frequency band

- 4.9 Published values of ' α ' from ISO9613 Part 1 [9] have been used, corresponding to a temperature of 10°C and a relative humidity of 70%, the values specified in the IoA Acoustics Bulletin Vol 34 no. 2 article *Prediction and Assessment of Wind Turbine Noise*, which give relatively low levels of atmospheric attenuation, and subsequently worst case noise predictions as given in Table 4.

Table 4– Atmospheric Absorption Coefficients

Octave Band Centre Frequency (Hz)	63	125	250	500	1k	2k	4k	8k
Atmospheric Absorption Coefficient (dB/m)	0.0001	0.0004	0.0010	0.0019	0.0037	0.0097	0.0328	0.1170



A_{gr} - Ground Effect

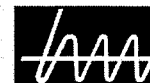
- 4.10 Ground effect is the interference of sound reflected by the ground interfering with the sound propagating directly from source to receiver. The prediction of ground effects are inherently complex and depend on the source height, receiver height, propagation height between the source and receiver and the ground conditions. The ground conditions are described according to a variable G which varies between 0 for 'hard' ground (includes paving, water, ice, concrete & any sites with low porosity) and 1 for 'soft' ground (includes ground covered by grass, trees or other vegetation). The IoA Acoustics Bulletin article agreement that use of $G = 0.5$ and a receptor height of 4m will generally result in realistic estimates of noise emission levels at receptor locations downwind of wind turbines where predictions are based on manufacturers warranted noise data which is the case for this assessment. All predictions in this report are therefore based on $G = 0.5$ and a receptor height of 4 m. It should be noted that under worst case noise propagation conditions, noise levels could be up to 2 dB higher at receptor locations.

A_{bar} - Barrier Attenuation

- 4.11 The effect of any barrier between the noise source and the receiver position is that noise will be reduced according to the relative heights of the source, receiver and barrier and the frequency spectrum of the noise. The barrier attenuations predicted by the ISO 9613 model have, however, been shown to be significantly greater than that measured in practice under downwind conditions. The results of a study of propagation of noise from wind farm sites carried out for ETSU [10] concludes that an attenuation of just 2 dB(A) should be allowed where the direct line of site between the source and receiver is just interrupted and that 10 dB(A) should be allowed where a barrier lies within 5 m of a receiver and provides a significant interruption to the line of site. It should be noted that no barrier attenuation has been used in any of the noise predictions carried out here since there is no significant shielding at this site. IoA Acoustics Bulletin article states that '*Generally, no account should be taken of barrier attenuation by the landform unless there is no line-of-sight between the receptor and the highest point on the rotor*'.

A_{misc} – Miscellaneous Other Effects

- 4.12 ISO 9613 includes effects of propagation through foliage, industrial plants and housing as additional attenuation effects. These have not been included here and any such effects are unlikely to significantly reduce noise levels below those predicted.



Predicted Noise Levels

- 4.13 Noise predictions were carried out centred on the site for a wind speed of 10 m/s at 10 m height. The results are plotted in the form of noise contours shown in Figure 1. It should be noted that these represent downwind propagation in all directions simultaneously, which clearly cannot occur in practice. The proposed turbine location (E 295306 N 726818) and nearest financially involved and non-financially involved residential properties are also marked on Figure 1.
- 4.14 The predicted turbine noise L_{Aeq} has been adjusted by subtracting 2 dB to give the equivalent L_{A90} as suggested in ETSU-R-97, as discussed at Paragraph 3.6 (above). Table 5, below, shows the worst-case predicted noise levels at the nearest financially involved and non-financially involved properties.

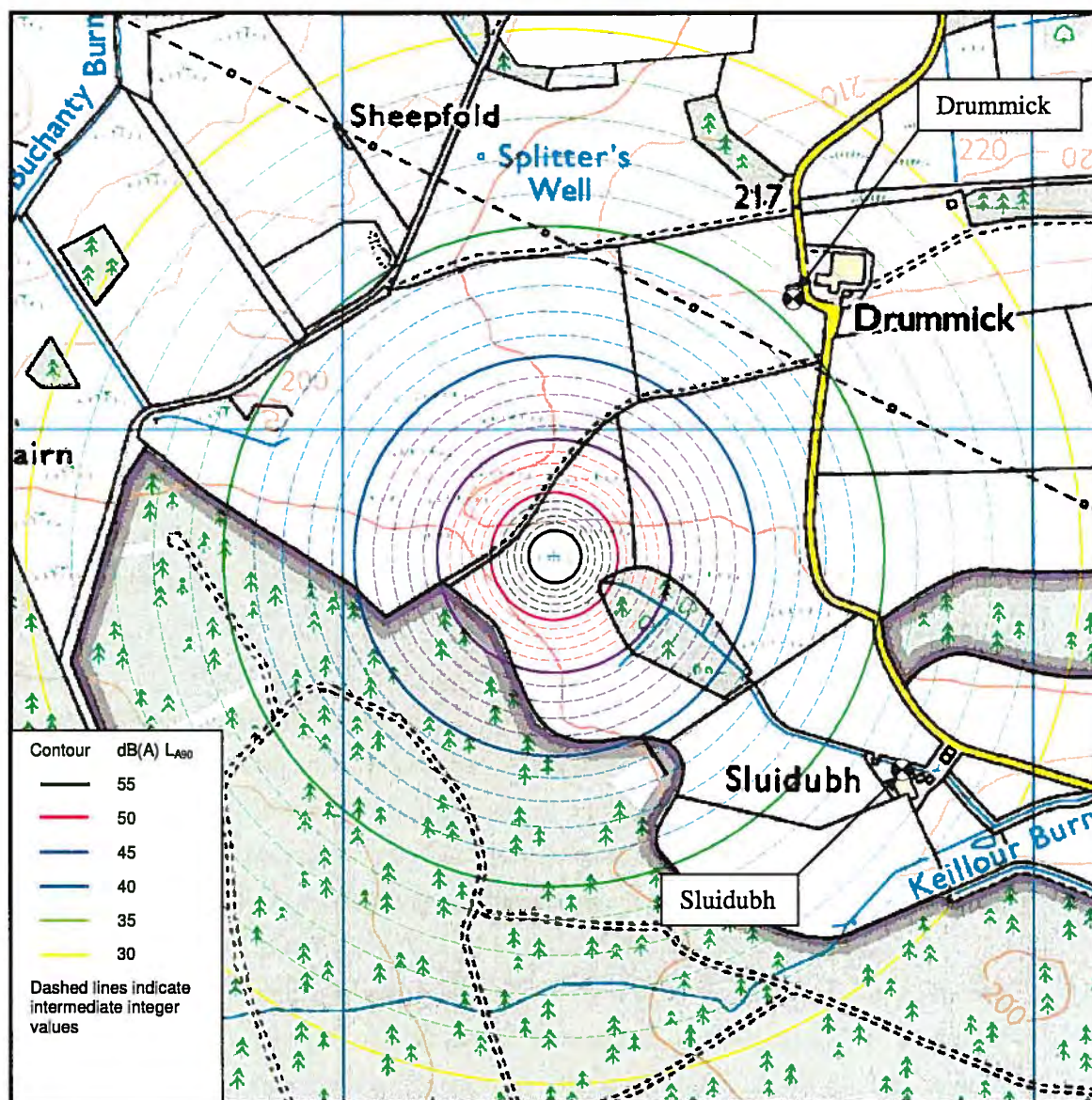
Table 5 – Predicted Noise Levels and Limits

Property	Easting	Northing	Predicted Noise Level (dB L_{A90})	Limit (dB L_{A90})
Drummick*	295651	727190	34.4	45
Sluidubh	295808	726509	32.8	35

**Drummick is financially involved and therefore qualifies for the financially involved noise limit with the scheme (as discussed at paragraph 3.7)*



Figure 1 – Noise Contours for Standardised Wind Speed of 10 m/s at 10 m Height



© Crown copyright. All rights reserved. Licence no. AL 100011286.

It should be noted that these contours represent worst-case downwind conditions and assume no attenuation from any barriers. For upwind propagation noise levels will be significantly lower.



5. NOISE ASSESSMENT

Operational Noise Assessment

- 5.1 It can be seen at Figure 1 and Table 5 that no non-financially involved residential properties fall within the predicted 35dB L_{A90} contour for the proposed turbine. The highest predicted noise level at any residential dwelling is 33.8 dB L_{A90} at Sluidubh, to the south east of the site, which is lower than the ETSU-R-97 simplified noise limit (see Paragraph 3.9 (above)) by 2.2 dB.
- 5.2 It is important to note that this margin of 2.2 dB at the nearest non-financially involved residential dwelling with the highest predicted noise level allows the ETSU-R-97 limit to be met even with the inclusion of the 1 dB safety factor recommended by the manufacturer.
- 5.3 It can also be seen at Figure 1 and Table 5 that the predicted noise level at the financially involved Drummick is significantly below the fixed financially involved noise limit of 45 dB recommended in ETSU-R-97.
- 5.4 Factors affecting the likelihood of significant amplitude modulation effects are discussed at Paragraph 3.16 (above). It should be noted that any effects caused by the interaction of multiple turbines will not occur at a single turbine site such as this. In addition, it should be noted that the ratio of tower height to rotor diameter is large and there are no significant topographical features at this site, further reducing the likelihood of such effects.
- 5.5 Planning conditions regulating noise from the site that set a noise limit of 35 dB L_{A90} up to a standardised 10 metre height wind speed of 10 m/s for non-financially involved residential properties and 45 dB L_{A90} for financially involved properties, with a provision for the application of a tonal penalty when applicable, could be considered by the local planning authority to protect residential amenity.

6. CONCLUSIONS

- 6.1 An assessment of the likely noise impact of the proposed Drummick wind turbine has been carried out.
- 6.2 Worst case downwind turbine noise levels at the closest residential locations to the site have



been predicted based on warranted sound power level data for an Enercon E53 wind turbine. Predictions were carried out according to recommendations in the Institute of Acoustics (IoA) Acoustics Bulletin Vol 34 no. 2 article *Prediction and Assessment of Wind Turbine Noise*.

- 6.3 The assessment has been carried out by comparing predicted noise levels with noise limits described in ETSU-R-97, *Assessment and Rating of Noise from Wind Farms*, as referred to in PAN 1/2011, *Planning and Noise*.
- 6.4 The assessment shows that the predicted wind turbine noise levels at all non-financially involved residential properties meets the ETSU-R-97 simplified noise limit under all conditions by a margin of 2.2 dB, which is greater than the 1dB safety factor recommended by Enercon.



References

- [1] Planning and Noise, Planning Advice Note 1/2011
Scottish Government, 2011
- [2] Onshore Wind Turbines, <http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables/Onshore> [16 May 2011].
Scottish Government, 2010
- [3] ETSU-R-97, The Assessment and Rating of Noise from Wind Farms
ETSU for the Department of Trade and Industry, 1996
- [4] Acoustics Bulletin Vol 34 No.2, Prediction and Assessment of Wind Turbine Noise,
Bowdler et al., Institute of Acoustics, March/April 2009,
- [5] W/45/00656/00/00, The Measurement of Low Frequency Noise at Three UK Windfarms
Department of Trade and Industry, 2006
- [6] DEFRA NANR233, Research into amplitude modulation of wind turbine noise
Moorhouse et al., University of Salford, July 2007
- [7] ISO 9613-2, Acoustics - Attenuation of Sound During Propagation Outdoors,
Part 2: General Method of Calculation
International Organization for Standardization, 1996
- [8] Muller-BBM Measurement Report – MBBM M87 748/2
- [9] ISO 9613-1, Acoustics - Attenuation of sound during propagation outdoors
Part 1: Method of calculation of the attenuation of sound by atmospheric absorption.
International Organization for Standardization, 1992
- [10] ETSU W/13/00385/REP, A Critical Appraisal of Wind Farm Noise Propagation
Department of Trade and Industry 2000

APPENDIX A

MANUFACTURERS NOISE DATA

Guaranteed Values of the Sound Power Level for the E-53 with 800 kW rated power

<div> <div>Hub height</div> <div>V_{Wind} in 10m height</div> </div>	60 m	73 m	75 m (India/Brasil)
4 m/s	92.0 dB(A)	92.5 dB(A)	92.8 dB(A)
5 m/s	93.7 dB(A)	94.2 dB(A)	94.5 dB(A)
6 m/s	97.2 dB(A)	97.7 dB(A)	97.9 dB(A)
7 m/s	99.7 dB(A)	100.1 dB(A)	100.3 dB(A)
8 m/s	101.3 dB(A)	101.5 dB(A)	101.8 dB(A)
95% rated power	102.5 dB(A)	102.5 dB(A)	102.5 dB(A)
10 m/s	102.5 dB(A)	102.5 dB(A)	102.5 dB(A)

Measured value at 95% rated power			100.9 dB(A) MBBM 69915/1
-----------------------------------	--	--	-----------------------------

- A tonality value K_{TN} of 0-1 dB is guaranteed over the whole operational range (valid in the near vicinity of the turbine according to IEC).
- An impulsivity value K_{IN} of 0 dB is guaranteed over the whole operational range (valid in the near vicinity of the turbine according to IEC).
- The sound power values given in the table are valid for the **Operational Mode I** (defined through the rotational speed range of 12 – 29 rpm). The respective power curve is the Calculated Power Curve E-53 dated June 2005 (Rev. 1.x).
- The guarantee is based on official and internal measurements of the sound power level. The official measured values are given in this document as a reference. The extracts of the official measurements are available and are valid in combination with this guarantee document. The measurements are being carried out according to the recommended national and international standards and norms (mentioned on the respective extracts).
- In order to account for the uncertainties of measurement and sound prediction calculations, to increase the acceptance at the authorities and to avoid eventual verification measurements ENERCON recommends a safety factor of 1 dB(A) on the guaranteed values when carrying out sound propagation calculations. In countries where safety factors are already mandatory due to local regulations, the ENERCON recommendation is not applicable.

Should this recommendation be neglected for any reasons, it is hereby explicitly referred to 6.
- Due to the measurement uncertainties of sound measurements the verification of the guaranteed values is successful, if the measurement result of a measurement that has been carried out according to the accepted standards is in the range of +/- 1dB(A) of the guaranteed values [guarantee fulfilled when measurement result = guaranteed value +/- 1dB(A)].
- For noise-sensitive sites it is possible to operate the E-53 with reduced rotational speed and reduced rated power during the night. The reduced sound power levels are given in a separate document.

Document information:		ENERCON reserves the right to technical modifications	
Author/ date:	MK / 09.11.05	Translator / date:	MK / 10.03.05
Department:	SA	Revisor / date:	-
Approved / date:	RW / 02.05.07	Reference:	SA-04-SPL Guarantee E-53-Rev2_0-ger-eng
Revision / date:	2.0 / 02.05.07		

Bestimmung der Schalleistungspegel aus mehreren Einzelmessungen

entsprechend Anhang D von [1]

Seite 1/2

Auf der Basis von mindestens drei Messungen nach der "Technischen Richtlinie für Windenergieanlagen" [1] besteht die Möglichkeit die Schallemissionswerte eines Anlagentyps gemäß [2] anzugeben, um die schalltechnische Planungssicherheit zu erhöhen.

Anlagendaten

Hersteller	Enercon GmbH Dreckamp 5 26605 Aurich	Anlagenbezeichnung	E-53
		Nennleistung	800 kW
		Nabenhöhe	60 m
		Rotordurchmesser	53 m

Angaben zur Einzelmessung	Messung-Nr.					
	1	2	3	4	5	6
Seriennummer	53001	53237	53467			
Standort	Wittmund	Ringstedt	Vara, Schweden			
vermess. Nabenhöhe (m)	76	73	73			
Messinstitut	Müller-BBM	Windtest KWK	Müller-BBM			
Prüfbericht	M69 915/2	WT 6263/08	M87 748/1			
Datum	27.04.2007	14.02.2008	14.06.2010			
Getriebetyp	---	---	---			
Generatortyp	E-53	E-53	E-53			
Rotorblatttyp	E-53/1	E-53/1	E-53/1			

Schallemissionsparameter: Messwerte (Prüfbericht Leistungskurve, berechnete Leistungskurve)**Schalleistungspegel**

Messung	Schalleistungspegel	Windgeschwindigkeit in 10 m Höhe					$L_{WA,P,0.95\% \text{ Power}}$
		6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	
1	$L_{WA,P}^{[3]}$	96,2 dB(A)	98,8 dB(A)	100,3 dB(A)	100,9 dB(A)	100,8 dB(A)	100,7 dB(A)
2	$L_{WA,P}^{[4]}$	97,9 dB(A)	100,2 dB(A)	101,4 dB(A)	101,4 dB(A)	---	101,4 dB(A)
3	$L_{WA,P}^{[5]}$	97,8 dB(A)	100,6 dB(A)	101,9 dB(A)	101,9 dB(A)	---	101,9 dB(A)
Mittelwert L_W		97,3 dB(A)	99,9 dB(A)	101,2 dB(A)	101,4 dB(A)	100,8 dB(A)	101,4 dB(A)
Standardabweichung s		1,0 dB	1,0 dB	0,8 dB	0,5 dB	---	0,6 dB(A)
K nach [2] $\sigma_R = 0,5 \text{ dB(A)}$ [6]		2,1 dB	2,1 dB	1,8 dB	1,4 dB	---	1,5 dB(A)

Schallemissionsparameter: Zuschläge**Tonzuschlag**

Messung	Tonzuschlag	Windgeschwindigkeit in 10 m Höhe					
		6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	
1	K_{TN}	---	---	---	---	---	
2	K_{TN}	---	---	---	---	---	
3	K_{TN}	---	---	---	---	---	
Mittelwert K_{TN}		---	---	---	---	---	

Impulzzuschlag

Messung	Tonzuschlag	Windgeschwindigkeit in 10 m Höhe					
		6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	
1	K_{IN}	---	---	---	---	---	
2	K_{IN}	---	---	---	---	---	
3	K_{IN}	---	---	---	---	---	
Mittelwert K_{IN}		---	---	---	---	---	

Bestimmung der Schalleistungspegel aus mehreren Einzelmessungen

entsprechend Anhang D von [1]

Seite 2/2

Schallemissionsparameter: Terz-/ Oktavschalleistungspegel für eine Nabenhöhe von 75 m

Terz-Schalleistungspegel (Mittel aus 3 Messungen) in dB(A); Referenzpunkt $v_{10LWA, Pmax} = 9 \text{ m/s}$ [7]												
Fequenz	50	63	80,0	100,0	125,0	160,0	200,0	250,0	315,0	400,0	500,0	630,0
$L_{WA,P}$	75,0	77,2	79,6	82,2	83,9	86,5	85,9	87,1	87,7	87,5	89,1	89,7
Fequenz	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
$L_{WA,P}$	90,8	91,9	92,5	92,0	90,7	89,0	86,2	84,3	81,9	78,4	72,6	69,0

Oktav-Schalleistungspegel (Mittel aus 3 Messungen) in dB(A); Referenzpunkt $v_{10LWA, Pmax} = 9 \text{ m/s}$ [7]									
Fequenz	63	125	250	500	1000	2000	4000	8000	
$L_{WA,P}$	82,4	89,3	91,7	93,6	96,6	95,5	89,2	79,8	

Die Angaben ersetzen nicht die u. g. Prüfberichte (insbesondere bei Schallimmissionsprognosen).

Bemerkungen:

- [1] Technische Richtlinien für Windenergieanlagen, Teil 1: Bestimmung der Schallemissionswerte, Revision 18, 01.02.2008, Herausgeber: Fördergesellschaft Windenergie e.V., Stresemannplatz 4, 24103 Kiel
- [2] IEC 61400-14 TS ed. 1, Declaration of Sound Power Level und Tonality Values of Wind Turbines, 2005-03
- [3] Die Schalleistungspegel wurden auf Grundlage der Daten in dem Bericht M69 915/2 der Firma Müller-BBM GmbH für die Nabenhöhe von 60 m aktuell ermittelt.
- [4] Die Schalleistungspegel wurden auf Grundlage der Daten in dem Bericht WT 6263/08 der Firma Windtest KWK für die Nabenhöhe von 60 m aktuell ermittelt.
- [5] Die Schalleistungspegel wurden auf Grundlage der Daten in dem Bericht M87 748/1 der Firma Müller-BBM GmbH für die Nabenhöhe von 60 m aktuell ermittelt.
- [6] Die Messunsicherheit σ_R wurde im Rahmen des vom LUA NRW durchgeführten Ringversuches zu $\sigma_R = 0,5 \text{ dB(A)}$ festgestellt.
- [7] Bei allen drei Messungen (Berichte [3] bis [5]) wurden in der angegebenen Windklasse der maximale Schalleistungspegel bestimmt.

Berechnet durch: Müller-BBM GmbH
Niederlassung Gelsenkirchen
Am Bugapark 1
45 899 Gelsenkirchen

MÜLLER-BBM GMBH
NIEDERLASSUNG GELSENKIRCHEN
AM BUGAPARK 1
45899 GELSENKIRCHEN
TELEFON (0209) 9 83 08 - 0



Datum: 12.07.2010



Dipl.-Ing. (FH) M. Köhl

MÜLLER-BBM
Akkreditiertes Prüflaboratorium
nach ISO/IEC 17025





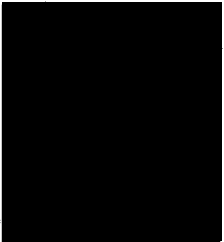
Drummick

Drummick Wind Turbine:
Aviation Effects Report

Drummick

Drummick Wind Turbine: Aviation Effects Report

Document Control

Responsible for	Job Title	Name	Date	Signature
Content	Development Consultant	Stephanie Clarke	2011-11-28	
Checked	Development Consultant	James Newberry	2011-12-09	
Approval	Director of Technical Services	Nick Fleming	2011-12-16	
Copyright:	PMSS ©	Document Reference:	29827	

Signatures in this approval box have checked this document in line with the requirements of QP16

This report has been prepared by Project Management Support Services Ltd with all reasonable skill and care, within the terms of the contract with the Client. The report contains information from sources and data which we believe to be reliable but we have not confirmed that reliability and make no representation as to their accuracy or completeness.

Record of Changes

Revision Number	Date	Page Number	Description	Approved
A	2011-12-09	All	Initial draft for internal review	JSN
B	2012-01-20	6	Unit Addition	SHC
C				
D				
E				
F				
G				
0	2011-12-16	All	Client Issue	NKF
1				
2				
3				
4				
5				
6				

Distribution List

#	Function Title	Company	Name (optional)
1	Director	ClearWinds Limited	William Clare
2	Project File 29827	PMSS Ltd	Bath Server
3	Senior Environmental Planner	Pegasus Planning Group	Annabel Roberts
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
Notes:			

Table of Contents

1.	Aviation	6
1.1.	Introduction	6
1.1.1.	Site Location	6
1.2.	Methodology	6
1.3.	Consultation Responses	6
1.3.1.	Ministry of Defence	6
1.3.2.	CAA	7
1.3.3.	NATS	7
1.4.	Conclusion	7
Appendix 1: MoD Consultation Response		8
Appendix 2: CAA Consultation Response		10
Appendix 3: NATS Consultation Response		12

Technical Appendices

Appendix 1	MOD Consultation Response
Appendix 2	CAA Consultation Response
Appendix 3	NATS Consultation Response

Abbreviations

CAA	Civil Aviation Authority	NERL	NATS En-Route plc
LPA	Local Planning Authority	OS	Ordnance Survey
MoD	Ministry of Defence	PMSS	Project Management Support Services Ltd
NATS	National Air Traffic Services	WTG	Wind Turbine Generator

1. Aviation

1.1. Introduction

This report presents a summary of the activities that were carried out in order to identify and resolve potential for effects on nearby civil and military aviation, and meteorological stakeholders as a result of the construction of the proposed Wind Turbine Generator (WTG) at Drummick.

The report has been produced based on the findings of aviation analysis undertaken by Project Management Support Services Limited (PMSS), and subsequent correspondence with various statutory consultees.

1.1.1. Site Location

The proposed development at Drummick is centred at Ordnance Survey (OS) grid location NN 95306 26818, consisting of a single WTG. The WTG will have a maximum height of up to 77 metres to blade tip.

1.2. Methodology

In line with best practice and current regulatory requirements, initial consultations on the development area were carried out between September and December 2010, originally on a 3 x 121m WTG proposal, to determine the potential air safeguarding effects associated with a wind energy development at Drummick.

Consultations for this area initially focused on the Ministry of Defence (MoD) and Civil Aviation Authority (CAA) (prior to the CAA changing their policy on pre-application advice in early 2011). Both aviation stakeholders were provided with the coordinates and approximate heights of the proposed turbine locations. These were then analysed to ensure that the reported locations do not interfere with low level flight or radar sight-lines that may have a detrimental effect on aircraft safety or national security.

Responses from the CAA (prior to 2011) highlighted airports they believe required consultation if the site falls within their safeguarding zone to establish whether they will be adversely affected once turbine locations have been established. The CAA also forwarded relevant applications to NATS (National Air Traffic Services) who can perform technical assessments and operational assessments.

1.3. Consultation Responses

1.3.1. Ministry of Defence

The MoD was consulted via the standard pro-forma delivered to Defence Estates in September 2010. This consultation was based on 3 turbines just slightly north of the current proposed scheme with maximum tip heights of 121 metres (44m taller than the current maximum height of the scheme). Defence Estates responded in November 2010 on behalf of the MoD stating that they had no objections to the proposed site (see **Appendix 1**).

The MoD requests that in the interests of safety, the turbine is fitted with aviation lighting. The turbine should be fitted with 25 candela omni-directional red lighting or infrared lighting with an

optimised flash pattern of 60 flashes per minute of 200m/s to 500m/s duration at the highest practicable point.

1.3.2. CAA

The CAA were consulted by PMSS in December 2010 and responded to say that they had no airport specific observations based on a WTG tip height of 121 metres (**Appendix 2**). The CAA forwarded details of the proposal onto NATS as a matter of course, to enable NATS to identify any issues there may be related to en route navigational facilities.

1.3.3. NATS

NATS were consulted via their Basic NERL Pre-Planning Consultancy Assessment to ascertain whether a wind development at Drummick would interfere with their infrastructure, as suggested by the CAA. NATS responded to advise that the proposed development area had been examined by their technical safeguarding team and that the proposed development does not conflict with their safeguarding criteria (**Appendix 3**). As a result NATS would be unlikely to object to the proposed development as of the date of consultation.

1.4. Conclusion

It is considered that the findings of the analysis and the comments of statutory consultees demonstrate that there would be no significant effects on aviation interests as a result of a WTG operating at Drummick at the designated coordinates, with or without further micrositing provisions.

Appendix 1: MoD Consultation Response



MINISTRY OF DEFENCE

Ms Jessica Knight
Clear Winds Ltd c/o PMSS
PMSS Ltd
19-20 Charles Parade
Charles Street
Bath
BA1 1HX

Richard Maisey
Safeguarding Assistant

Safeguarding - Wind Energy
Defence Estates
Kingston Road
Sutton Coldfield
West Midlands
B75 7RL

Cyranne Taylor: 0121 311 2195
Claire Duddy: 0121 311 3714
Facsimile: 0121 311 2218
E-mail: cyranne.taylor@de.MOD.uk
E-mail: claire.duddy@de.MOD.uk
Internet Site: www.defence-estates.MOD.uk

Your Reference: JDK/29827

Our Reference: DE/C/SUT/43/10/1/10773

8 November 2010

Dear Ms Knight

DE Reference Number: 10773

Site Name: Drummick

I am writing to tell you that the Ministry of Defence (MOD) has no concerns with the proposal as set out in your pro-forma dated 16th September 2010.

The application is for 3 turbines at 121 metres to blade tip. This has been assessed using the grid reference below as submitted in your pro-forma.

Turbine	100km Letter	Square Easting	Northing
1	NN	97201	27314
2	NN	96704	27311
3	NN	94988	27071

An initial assessment has not identified any Line Of Sight issues to any RAF ATC Radar. MOD expects to have no concerns (pending assessment of a full planning application should this proposal progress).

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

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

If you apply for planning permission you must ensure that the relevant planning authority consults this office to ensure that no concerns have arisen since the date of this letter.

If planning permission is granted you must tell us;

- 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.

It should be noted that this response is based on current levels of wind farm development in the area. If additional wind farms are consented or built prior to this development being submitted for planning consent, our position may change.

Defence Estates 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.

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

Yours sincerely

Richard Maisey
Safeguarding Assistant – Wind Energy
Defence Estates

SAFEGUARDING SOLUTIONS TO DEFENCE NEEDS

Appendix 2: CAA Consultation Response

Our Ref: DAP/Wind/Drummick Wind Farm\3375
Your Ref: ClearWinds Ltd (JDK/29827)

Dear Ms Knight
Wind Farm Proposal - Drummick Wind Farm

Thank you for notification of the title proposal. This Directorate has no Airport specific observations.

There may be issues related to en route navigational facilities. Accordingly details of your proposal have been copied to National Air Traffic Services for any comment. If you do not hear from NATS or wish to contact them, they can be contacted at:

National Air Traffic Services Ltd
Navigation Spectrum & Surveillance
Corporate and Technical Centre
4000 Parkway, Whiteley
Fareham
Hampshire
PO15 7FL
Email: nerlsafeguarding@nats.co.uk

For completeness it would also be sensible to establish the related viewpoint of local emergency services air support units. This is because of the unique nature of their operations in respect of operating altitudes and potentially unusual landing sites.

In respect of any aviation need to increase the conspicuity of the turbines, there might be a need to install aviation obstruction lighting to some or all of the associated wind turbines should development proposals be progressed:

- The need to install such lighting to any individual turbine becomes legally mandated should the maximum blade tip height (i.e. above ground level) be 150m or more (the UK Air Navigation Order Article 219 refers).
- Where the maximum blade tip height is less than 150m, the potential lighting requirement is highlighted in anticipation of any concerns expressed by other elements of the aviation industry, ie the operators. For example, if the Ministry of Defence (MoD) or a local aerodrome had suggested such a need, we the CAA (sponsor of policy for aviation obstruction lighting) would wish, in generic terms, to support such a claim. We would do so if it could reasonably be argued that the structure(s), by virtue of their location and nature, could be considered a significant navigational hazard. That said, if the claim was clearly outside credible limits (ie the proposed turbine(s) was/were many miles away from an any aerodrome or it/they were of a height that was unlikely to affect even military low flying) the Authority would play an 'honest-broker' role. Responsibility for establishing further lighting related comment rests with the developer.
- Further related comment is provided at <http://www.caa.co.uk/docs/7/20100401LightingOfEnRouteObstaclesAndOnshoreWindTurbinesFi%e2%80%a6.pdf>
- All parties should be aware that international aviation regulatory documentation requires that the rotor blades, nacelle and upper 2/3 of the supporting mast of wind turbines that are deemed to be an aviation obstruction should be painted white, unless otherwise indicated by an aeronautical study. It follows that the CAA advice on the colour of wind turbines would align with these international criteria.

The number of pre-planning enquiries associated with windfarm developments has been significant. It is possible that the proliferation of wind turbines in any particular area might potentially result in difficulties for aviation that a single development would not have generated. It is, therefore, not necessarily the case that, because a generic area was not objected to by the aviation industry, future, similarly located potential developments would receive the same positive response.

Developers are advised that there is a civil aviation requirement in the UK for all structures over 300 feet high to be charted on civil aviation maps (I understand that the ministry of defence utilises a lower threshold height). Should this proposed wind turbine development progress and the 300 feet height be breached, to achieve this civil aviation charting requirement, developers will need to provide details of the development to:

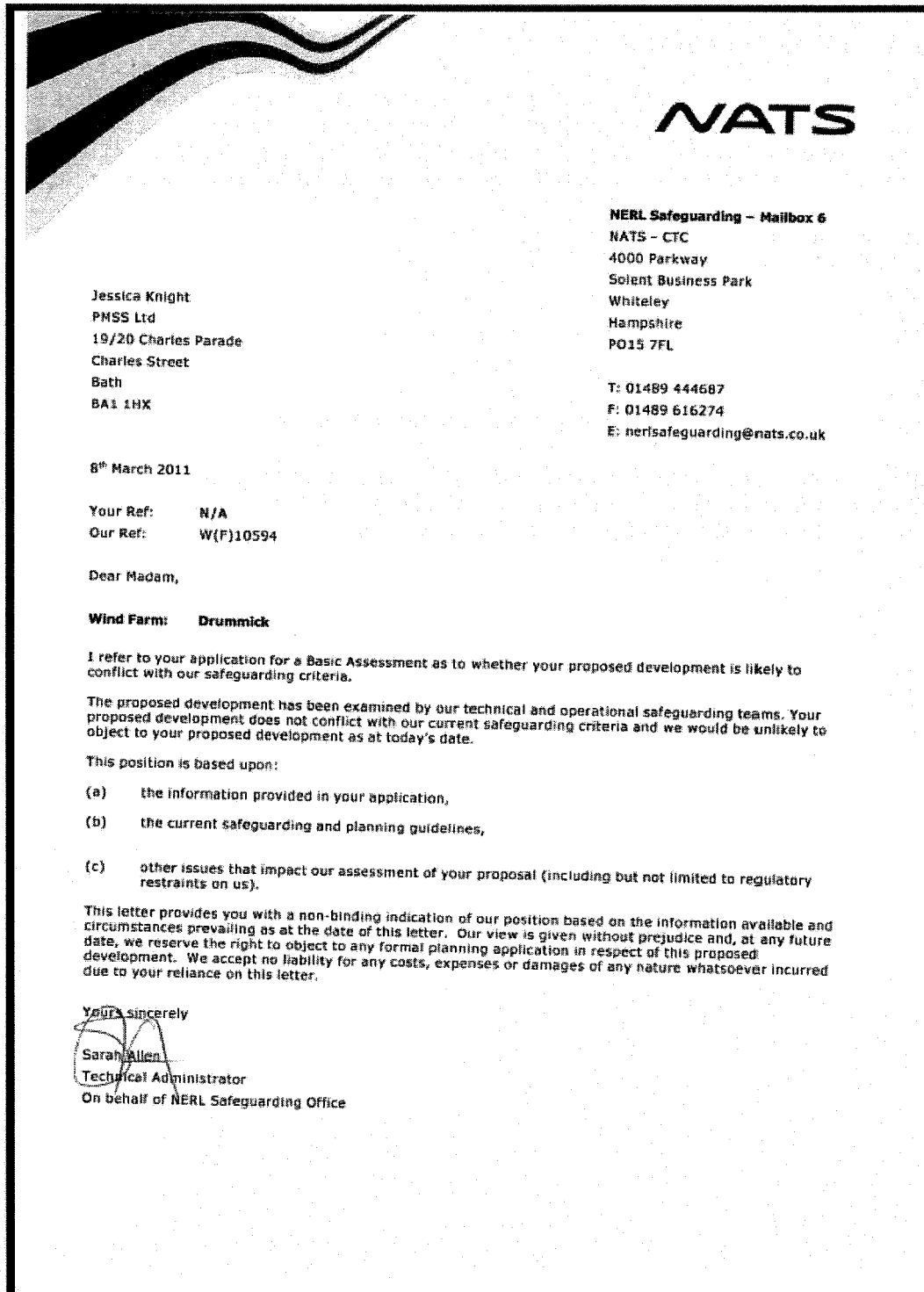
Defence Geographic Centre
AIS Information Centre
Jervis Building
Elmwood Avenue
Feltham
Middlesex
TW13 7AH
Telephone: 020 8818 2708 (This number is for Defence Geographic, not the CAA)

Finally, please note that an amendable electronic version of the wind turbine planning proforma is available at http://www.bwea.com/docs/developers_proforma.doc . Completed proformae should be E-mailed to the CAA via windfarms@caa.co.uk (previous adaptations of this e-mail address are no longer in use).

Regards

Steven Hickson
Windfarm Team
Directorate of Airspace Policy
CAA House, 45-59 Kingsway, London, WC2B 6TE

Appendix 3: NATS Consultation Response

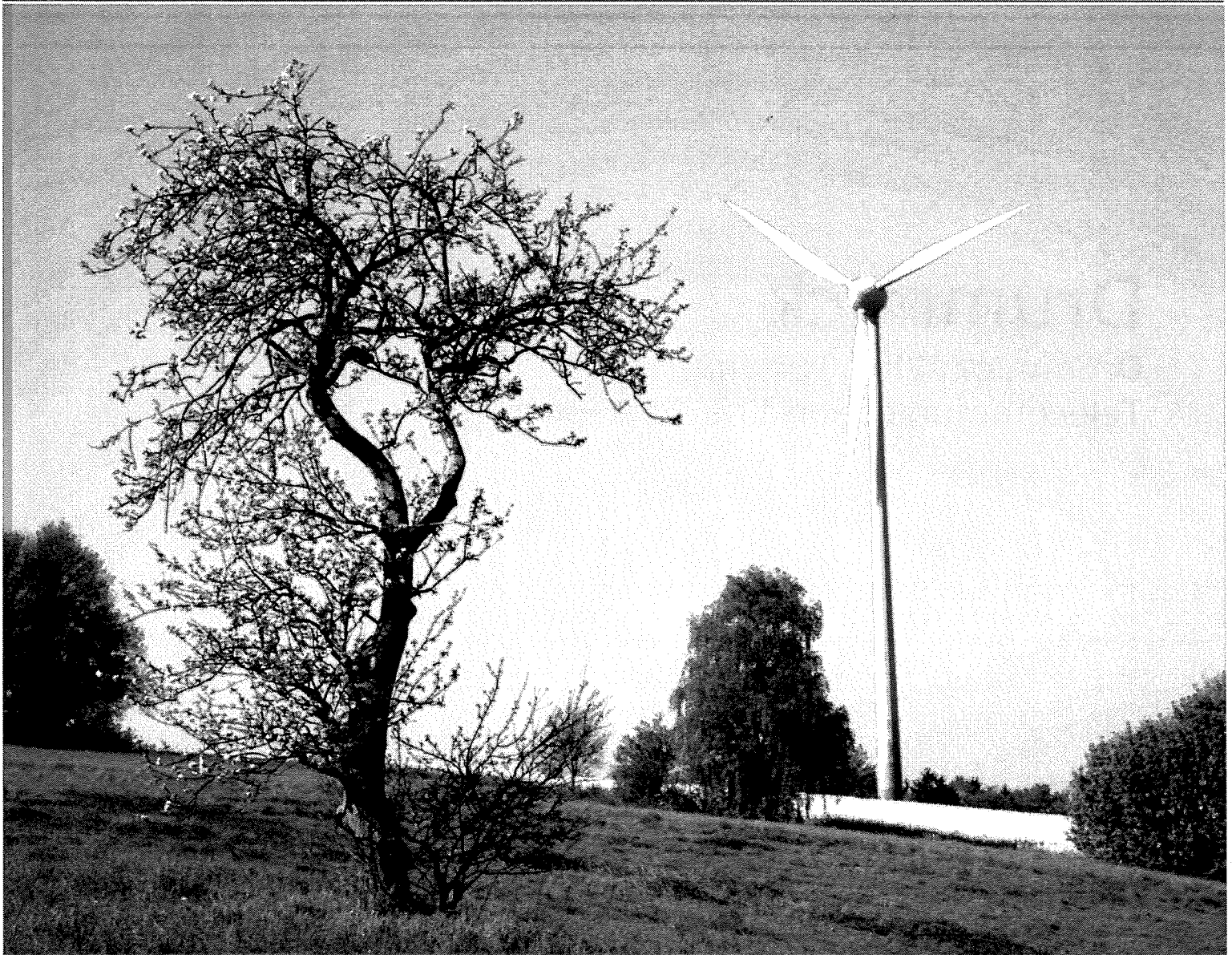


www.pmss.co.uk

Broadwater House
Broadwater Road
Romsey
Hampshire
SO51 8GT

Tel: +44 (0)1794 526 560
Fax: +44 (0)1794 516 826
Email: enquiry@pmss.co.uk

Project Management Services Limited
Registered in England No. 04479479
Incorporated in England, Broadwater House, Broadwater Road, Romsey, SO51 8GT



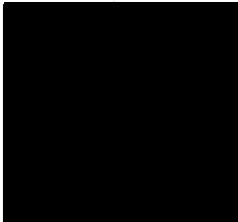
Drummick

Drummick Wind Turbine:
Telecommunication Effects Report

Drummick

Drummick Wind Turbine: Telecommunication Effects Report

Document Control

Responsible for	Job Title	Name	Date	Signature
Content	Development Consultant	Stephanie Clarke	200-12-09	
Checked	Development Consultant	James Newberry	2011-12-09	
Approval	Director of Technical Services	Nick Fleming	2011-12-09	

Copyright: PMSS ©

Document Reference:

29827

Signatures in this approval box have checked this document in line with the requirements of QP16

This report has been prepared by Project Management Support Services Ltd with all reasonable skill and care, within the terms of the contract with the Client. The report contains information from sources and data which we believe to be reliable but we have not confirmed that reliability and make no representation as to their accuracy or completeness.

Record of Changes

Revision Number	Date	Page Number	Description	Approved
A	2011-12-09	All	Initial draft for internal review	JSN
B	2012-01-20	All	Minor Changes	SHC
C				
D				
E				
F				
G				
0	2011-12-16	All	Client Issue	NKF
1				
2				
3				
4				
5				
6				

Distribution List

#	Function Title	Company	Name (optional)
1	Director	Clearwinds	William Clare
2	Senior Environmental Planner	Pegasus Planning Group	Annabel Roberts
3	Folder 29827	PMSS	Bath Server
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Notes:

Table of Contents

1.	Telecommunications	6
1.1.	Introduction	6
1.1.1.	Site Location	6
1.1.2.	Electromagnetic Interference and Wind Turbines	6
1.2.	Methodology	6
1.3.	Assessment of Effects	7
1.3.1.	Transmitters and Signals	7
1.3.2.	Analogue Reception Issues	7
1.3.3.	Microwave Links	7
1.3.4.	Scanning Telemetry	7
1.3.5.	Joint Radio Company	8
1.3.6.	Atkins Limited	8
1.4.	Mitigation	8
1.5.	Conclusion	8
	Appendix 1: BBC Wind Farm Tool Response	9
	Appendix 2: Spectrum Licensing (Ofcom) Response	10
	Appendix 3: Joint Radio Company Response	11
	Appendix 4: Atkins Response	12

Technical Appendices

Appendix 1	BBC Wind Farm Tool Response
Appendix 2	Spectrum Licensing (Ofcom) Response
Appendix 3	Joint Radio Company Response
Appendix 4	Atkins Response

Abbreviations

BBC	British Broadcasting Corporation	OS	Ordnance Survey
EMI	Electro Magnetic Interference	PMSS	Project Management Support Services Ltd
JRC	Joint Radio Company	TAUWI	Telecommunications Association of the UK
Ofcom	Office of Telecommunications		Water Industry
OS	Ordnance Survey	Telecoms	Telecommunications
		WTG	Wind Turbine Generator

1. Telecommunications

1.1. Introduction

This report assesses the potential for effects on communications services which could be subject to interference as a result of construction of the proposed Wind Turbine Generator (WTG) at Drummick.

The report has been produced based on the findings of telecommunications (telecoms) analysis undertaken by Project Management Support Services Limited (PMSS), and subsequent correspondence with various stakeholders.

1.1.1. Site Location

The proposed development at Drummick is centred at Ordnance Survey (OS) grid location NN 95306 26818 consisting of a single WTG. This WTG will have a height of up to 77 metres to blade tip.

1.1.2. Electromagnetic Interference and Wind Turbines

Wind turbines have the potential to induce electromagnetic interference (EMI) on existing telecoms installations and links.

Wind turbines can cause electromagnetic interference by two means:

1. Electrical interference – caused by electrical signals generated within the wind turbine. Modern WTGs are designed to minimise the emissions of such interference.
2. Physical interference – caused by the WTG providing a second path between the transmitter and receiver of the signal causing a “scattering” of the signals. For example this can lead to the phenomenon of “ghosting” on TV screens.

1.2. Methodology

The potential for significant effects on communications systems was determined through an analysis of the potential effects undertaken by PMSS and consultation with the following organisations:

- Atkins Limited
- British Broadcasting Corporation (BBC)
- Joint Radio Company (JRC)
- Spectrum Licensing (previously known as Ofcom)

Spectrum Licensing were consulted as it holds a central register of all civil radio communications operators in the UK and acts as a central point of contact for identifying specific consultees relevant to the site. Spectrum Licensing analyse the area in question and advise of any telecommunications fixed microwave links potentially at risk from a wind farm development. Spectrum Licensing also directly contact JRC who consult on behalf of the energy industries (including electricity supply and gas supply companies) and Atkins Limited who since January 1st 2010 represent the Telecommunications Association of the UK Water Industry (TAUWI) having replaced CSS. The inclusion of JRC and Atkins in the consultation addresses any concerns in respect of lower frequency fixed scanning telemetry links.

The telecoms systems which were considered as part of this assessment are discussed under the following headings:

- Television
- Telecoms
 - Microwave Links
 - Scanning Telemetry

1.3. Assessment of Effects

Domestic Television Services

1.3.1. Transmitters and Signals

The television transmitters that serve the area have been identified as Angus and Perth (CH5) (**Appendix 1**). The BBC wind farm assessment tool has provided a prediction that 8 properties are likely to be affected which have no additional off-air service, and 0 homes are likely to be affected for which there may be alternative off-air service. However, while a useful basic tool, this figure is only used as a guide to the worst case scenario.

1.3.2. Analogue Reception Issues

According to Digital UK, the Angus transmitter (the most likely transmitter to be serving the STV North Region) has already switched to digital¹. Transfer to the full digital television service means that the area will benefit from enhanced reception and in addition, there will be less likelihood of interference arising from the presence of a local wind turbine.

Telecoms

1.3.3. Microwave Links

Information provided by Spectrum Licensing (**Appendix 2**) has indicated the presence of a single licensed microwave link operational within an 820m radius of the proposed turbine location. This is described in **Table 1**.

Link Reference	Operator
0862486/1	Scottish And Southern Energy Plc

Table 1: Individual Microwave Links within 820m of the Drummick Turbine

The written response from consultation with the JRC (to be discussed in 1.3.5) confirms that the proposal is clear with respect to interference with SSE (**Appendix 3**) and therefore the above link.

1.3.4. Scanning Telemetry

Telemetry is used primarily by utility companies to remotely monitor and control unmanned sites from a central location.

¹<http://www.digitaluk.co.uk/postcodechecker/main/display/basic/PH1+3SF/NA/0/m5412mrb9qmlifi6cva5hqa9q3>

1.3.5. Joint Radio Company (JRC)

On behalf of the UK fuel and power Industry, the Joint Radio Company (JRC) analyses proposals for wind farms in order to assess their potential to cause interference to radio systems operated by utility companies in support of their regulatory operational requirements. The energy industry considers that any wind energy development within 1km of a link operating below 3 GHz requires detailed coordination.

JRC responded to Spectrum Licensing's request, to advise that they do not foresee any potential problems based on known interference scenarios and the position of the turbine provided. In addition, the proposal is cleared with respect to radio link infrastructure operated by Scottish and Southern Energy (**Appendix 3**).

JRC's response therefore indicates that there will be no effects on this scanning telemetry link.

1.3.6. Atkins Limited

Atkins Limited assessed the turbine location for interference with UHF Radio Scanning Telemetry communications and found no objection to the development (**Appendix 4**).

1.4. Mitigation

Any effect on television reception can be resolved through technical solutions. Mitigation measures can include:

- Re-orientation of existing aerials to an alternative transmitter
- Installation of directional aerials
- Supply of cable or satellite television services

Whilst such mitigation measures may be required to alleviate any television interference, any requirement for these can only be assessed and considered once the development has been constructed and is operational. However, any necessary mitigation will be provided and following this, there will be no significant effect on domestic television services.

1.5. Conclusion

It is considered that the findings of the analysis and the comments of statutory consultees demonstrate that, following implementation of any necessary mitigation, there would be no significant effects on telecommunications as a result of a WTG operating at Drummick at the designated coordinate with or without further micro-siting provision.

Appendix 1: BBC Wind Farm Tool Response

From: Windfarms [Windfarm.Tool@bbc.co.uk]
Sent: 08 December 2011 17:09
To: Stephanie Clarke
Subject: [The BBC Windfarms Tool] Your query results.

If you were to place turbines in the following locations:

NN9530626818

You would be likely to affect 8 homes for whom there is no alternative off-air service.

In addition, you may affect up to 0 homes for whom there may be an alternative off-air service.

The transmitters likely to be affected are:

ANGUS
PERTH CH5

This information is provided for the guidance of Wind Farm developers. The results of this query are a rough estimate of populations that may suffer interference from wind farms built at the locations specified. The information is not intended to be a substitute for an on-site survey where the potential for disruption to television services may more accurately be assessed.

The BBC does not accept liability for the consequence of any use of the information provided by this web site. All television reception difficulties caused by the erection of wind turbines are the responsibility of the wind farm developer.

This email was automatically generated in response to a query at the BBC Windfarms Tool website. Please do not reply to this address.

If you wish to contact the BBC, please visit:
<http://www.bbc.co.uk/feedback/>

--

The BBC accepts no responsibility for this email. This email is generated by a request on the BBC webserver. If you were not expecting this email, please contact webweaver@bbc.co.uk including all headers from the email.

This email has been scanned by the Symantec Email Security.cloud service. For more information please visit <http://www.symanteccloud.com>

Appendix 2: Spectrum Licensing (Ofcom) Response

From: Spectrum Licensing [mailto:Spectrum.Licensing@ofcom.org.uk]
Sent: 16 November 2011 11:15
To: Stephanie Clarke
Subject: RE: 29827 111114 Drummick Turbine Ofcom Consultation

Dear Enquirer,

FIXED LINK REPORT FOR WINDFARM CO-ORDINATION AREA:

UK NGR NN 95306 26818
at search radius 820

Links	Company	Contact	Telephone	Email
0862486/1	Scottish And Southern Energy Plc	Nigel Baker	1189534512	nigel.baker@neosnetworks.co.uk

These details are provided to Ofcom by Fixed Link operators at the time of their licence application and cannot be 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 Peter Swan directly on 020 7953 7142.

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.

Regards,
Simon Mitchell

Appendix 3: Joint Radio Company Response

Dear Stephanie,

Site Name: Drummick, Perth and Kinross

Site Centre at NGR: 295306, 726818

Development Radius: 0.32km

Hub Height: 90m Rotor Radius: 50m

This proposal cleared with respect to radio link infrastructure operated by Scottish and Southern Energy

JRC analyses proposals for wind farms on behalf of the UK Fuel & Power Industry. 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. Please note that due to the large number of adjacent radio links in this vicinity, which have been taken into account, clearance is given specifically for a location within 100m of the declared grid reference (quoted above).

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, you are advised to seek re-coordination prior to submitting a planning application, as this will negate the possibility of an objection being raised at that time as a consequence of any links assigned between your enquiry and the finalisation of your project.

JRC offers a range of radio planning and analysis services. If you require any assistance, please contact us by phone or email.

Regards

Alessandra Lees BSc (Hons) MSc

Wind Farm Team

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

Appendix 4: Atkins Response

From: Windfarms (windfarms@atkinsglobal.com) [mailto:windfarms@atkinsglobal.com]
Sent: 17 November 2011 11:15
To: Stephanie Clarke
Subject: WF 13746 - Drummick Wind Turbine - NN 95306 26818

Dear Stephanie,

I am responding to an email of 16-Nov-2011, 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 TAUWI.

Windfarm Support

ATKINS

The official engineering design services provider for the London 2012 Olympic and Paralympic Games

Web: www.atkinsglobal.com/communications

www.pmss.co.uk

Broadwater House
Broadwater Road
Romsey
Hampshire
SO51 8GT

Tel: +44 (0)1794 526 560
Fax: +44 (0)1794 516 826
Email: enquiry@pmss.co.uk

Project Management Services Limited
Registered in England & Wales No 0205
Registered Office: Broadwater House, Broadwater Road, Romsey, SO51 8GT

10 SUMMARY and CONCLUSION

10.1 Introduction

This environmental reports compendium accompanies a full planning application for the erection of a single wind turbine with a maximum rated capacity of up to 900kW and a maximum tip height of 77m at Drummick, Glenalmond, Perth.

The compendium comprises a series of studies which have been commissioned to address the environmental issues which are considered pertinent to both the construction and operational phases of the proposed development. A summary of the findings of each study is presented below.

10.2 Site Context and Proposed Development

The proposed turbine development area is located in a rural area between Glenalmond approximately 1km to the north and Keilour approximately 2.5km south / south-east. An unclassified road passes east of the site area in a north – south direction, leading to Drummick. Buchanty Burn lies a little further west from the site area (see Site Context Plan **Figure 1** and Site Location Plan **Figure 2**). Existing land use within the site comprises grazing land which is surrounded by pasture land and forestry within the wider area. Overhead cables transect the eastern end of the site at a section running between Easter Buchanty and Bellour.

The proposed location of the turbine lies outside of any 'sensitive area' as described in the EIA Regulations. There are no Sites of Special Scientific Interest (SSSI) within or adjacent to the site; the closest being Methven Moss over 5km south east, a second SSSI, Connachan Marsh is 8km south west. There are no National Parks within or close to the site – the nearest being Loch Lomond and The Trossachs National Park over 66km to the west. The site is not within or close to any World Heritage Sites or Scheduled Monuments (SMs). The closest SMs are Fendoch Burn Roman Fort, Sair Law burial mound and Inchaffray Abbey approximately 4km away. The site is not within a National Scenic Area, the closest being River Tay (Dunkeld) approximately 15km north of the site. There are no Ramsar Sites, Special Protection Areas (SPAs) or Special Areas of Conservation (SAC) (European designations under the Habitats Regulations) within or adjacent to the site. The closest SAC is Methven Moss 5km away. The closest Ramsar Site and SPA is South Tayside Goose Roosts approximately 10km south east.

The proposal is for the erection of a single wind turbine with a maximum rated capacity of up to 900kW for a duration of 25 years benefiting from the Feed-in Tariff (FIT) programme which will see renewable energy fed into the grid, thus representing a contribution to the UK's renewable energy targets. The turbine would have a maximum tip height of 77m and a hub height of 50m. In addition the scheme will include erection of an anemometry mast up to 50m height for a period of 18 months as a pre-cursor to the turbine. The site is approximately 0.8 hectares.

The development proposals would assist in the wider need to protect natural resources and provide for the sensitive exploitation of renewable energy sources, all in accordance with national, regional and local policy guidance. Underground cabling will link the turbine to the on site substation. To minimise ground disturbance cables will be laid adjacent to the access tracks as shown on the layout plan (**Figure 3**).

10.3 Construction Effects

The construction period for Drummick will last approximately four months. The construction process will include the construction of a new entrance bell mouth, site tracks, temporary construction compound, crane hard standing, WTG foundation, turbine transformer housing, onsite control building, cable trenches and other site infrastructure. Connection of onsite cabling, delivery of the turbine itself and its erection will complete the construction process.

Site Restoration will be planned and carried out in order to restore any affected areas as early as possible.

The WTG will require an interconnection to the local electricity distribution network to permit the export of generated electricity. This connection is likely to be made at 11kV via underground cabling. A pending application has been made to the DNO (Scottish Hydro Electric Power Distribution PLC).

10.4 Ecology

An extended Phase 1 habitat survey and desk-based study was undertaken of the site and in order to identify any nearby sites designated for nature conservation interest and potential features of ecological interest in the wider area.

The survey covered all land within the landownership boundary where access permitted. The survey area contained a mixture of habitats, dominated by improved grassland with areas of poor semi-improved grassland, marshy grassland, rush pasture, rush heath and mixed, broadleaved and coniferous plantation woodland. Freshwater habitats were present in the form of scattered ponds, burns and drains. In the context of the proposed development, the turbine is situated in an area of rush pasture with tracts of broadleaved and coniferous plantation woodland nearby. A pond and drain network were also located in close proximity. The wider landscape is dominated by a similar array of habitats within the valley floor and sides, merging into the upland habitats of the adjacent hills.

The results of the field survey and desk study demonstrate that the wider survey area supports some features of ecological value, although the turbine area is proposed within a mixture of habitats including improved grassland, poor semi-improved grassland, semi-improved acid grassland, inundation vegetation and ditches of relatively low ecological value.

The application site is not contained within a statutory designated site. The River Tay SAC is located 1.5km to the north of the site South Tayside SPA/RAMSAR site and Dupplin Lakes SSSI area located 9.7km to the south east of the site.

Detailed wintering and breeding bird surveys, including Vantage Point surveys have been carried out in order to demonstrate the potential for impacts on protected and notable bird species in the area. The proposed turbine is located within the lowest zone of natural heritage sensitivity (Zone 1, SNH 2009) and within an area of low / unknown species sensitivity (RSPB, 2005), therefore it is considered that significant impacts on breeding and/or overwintering birds are considered unlikely overall.

Bat surveys have been undertaken where the results have identified the potential for impacts on bats is low due to the location of the turbine in relation to bat friendly landscape features.

There are no other ecological constraints anticipated in terms of ecology and nature conservation.

10.5 Landscape and Visual Assessment

The landscape and visual effects have been assessed for the proposed wind turbine within the landownership at Drummick. The proposed turbine is located within fields currently used for grazing and is not subject to any statutory or non-statutory environmental designations.

The proposed wind turbine is in support of national, regional, and local planning policy with regards to renewable energy, the need to protect landscape character, visual amenity, nature conservation and biodiversity. In particular, the proposals are in accordance with the objectives of National Planning policy. The development would also be in keeping with policies within regional and local plans.

The proposed wind turbine would not be obviously visible from key environmental designations, including the Loch Lomond and the Trossachs National Park, River Tay (Dunkeld) and River Earn (Comrie to St Fillans), or the Fowlis Wester Conservation Area (CAs)

The siting, scale and form of the wind turbine would introduce a further built element into the receiving landscape, although these would be generally viewed in the context of other infrastructure and transport corridors, including the pylons and transmission lines on the site itself, Perth, and the A85.

There would be no significant change to the physical characteristics of the surrounding area as identified within the landscape character assessments. Specifically, tree cover, field pattern, and drainage patterns would be materially unaltered by the development. As such the proposals would be in accordance with the findings of the 'Landscape Study Windfarm development in the Ochil Hills and Southern Highland Perthshire' that confirms the Lowland Hills landscape is capable of accommodating "sensitive wind windfarms".

It is evident from the Zone of Theoretical Visibility (ZTV) and field survey that actual visual envelope for the proposed wind turbine would be limited with visual effects restricted beyond 2km from the wind turbine. This would be due to the topography of area, tree cover, and distance.

At close proximity within 2km of the wind turbine, views of the rotor blades and tower would be evident near Sluidubh and Drummick (Photoview 8 and 9) to the south east and north west respectively.

Within more distant photoviews beyond 2km from the wind turbine, the tower and rotor blades generally form a small component of the view that would be assimilated into the wider landscape setting. The wind turbine would be scarcely perceptible from distant elevated locations to the south east including Dunning (Photoview 4) and Tullibardine Collegiate Church (Photoview 6). The outlying terrain of Mounth Highlands also provides an elevated backdrop behind the wind turbine, the result is that moving rotor blades would not be apparent on the skyline.

Although there would be visual change at close proximity it would not necessarily be a harmful one, merely slightly different to one that exists at present. It is also recognised that the proposed wind turbine would generally be viewed in the context of nearby pylons and transmission lines that already provides a strong vertical and horizontal built elements in the landscape. It is also acknowledged that any scheme involving renewable energy and wind turbines will form visible elements in the view.

The cumulative effect on both landscape and visual amenity arising from the proposed wind turbine and other wind farm developments would be minor.

The landscape report demonstrates that the proposed wind turbine could be successfully accommodated and assimilated into the wider landscape without causing significant harm to landscape character, visual amenity or the landscape features of the area. The proposed wind turbine would be acceptable in landscape and visual terms.

10.6 Archaeology & Cultural Heritage

There are no recorded cultural heritage assets within the site. Heritage assets recorded in the vicinity of the site comprise the 19th-century farmstead at Drummick to the north-east, the site of a 19th-century farmstead at Gorthy Wood to the west, and the rubble remains of a possible shieling to the south. Development proposals will have no known physical impact upon the cultural heritage resource.

There will be no non-physical (visual) impact upon the setting of Keillour Garden and Keillour Castle. Rising topography and intervening forestry plantation completely screen the proposed development site from these assets. Furthermore, the topographical setting of Keillour Castle and Garden, and vegetation within the gardens themselves, create a secluded setting which is largely screened from the surrounding landscape. The non-physical (visual) impact upon the significance of further designated heritage assets in the vicinity of the site is considered to be negligible. Intervening topography and vegetation largely screen the proposed development from nearby heritage assets.

10.7 Transport and Access

The potential impact of HGV traffic associated with the proposed turbine construction has been assessed in relation to existing traffic flows. The project would add no more than 40% to the average HGV flows on the A822 on the days when the movements are at their peak. This impact is considered insignificant in both the scale and the duration. In conclusion, this is a figure of less than 2% of the average total traffic flows on the A822.

It is recognised that the delivery of the turbine components will require careful thought and planning. Additionally given the nature of the size of these components it is likely that there will be a requirement for a police escort. Each delivery vehicle would follow a pre determined route and the times can be arranged so that minimal disruption is caused to other road users.

10.8 Noise

An assessment of the likely noise impact of the proposed Drummick wind turbine has been carried out. Worst case downwind turbine noise levels at the closest residential locations to the site have been predicted based on warranted sound power level data for an Enercon E53 wind turbine. Predictions were carried out according to recommendations in the Institute of Acoustics (IoA) Acoustics Bulletin Vol 34 no. 2 article *Prediction and Assessment of Wind Turbine Noise*.

The assessment has been carried out by comparing predicted noise levels with noise limits described in ETSU-R-97, *Assessment and Rating of Noise from Wind Farms*, as referred to in PAN 1/2011, *Planning and Noise*.

The assessment shows that the predicted wind turbine noise levels at all non-financially involved residential properties meets the ETSU-R-97 simplified noise limit under all conditions by a margin of 2.2 dB, which is greater than the 1dB safety factor recommended by Enercon.

10.9 Aviation Issues

It is considered that the findings of the analysis and the comments of statutory consultees demonstrate that there would be no significant effects on aviation interests as a result of a wind turbine operating at Drummick at the designated coordinate, with or without further micro-siting provisions.

10.10 Telecommunications

It is considered that the findings of the analysis and the comments of statutory consultees demonstrate that, following implementation of any necessary mitigation, there would be no significant effects on telecommunications as a result of a wind turbine operating at Drummick at the designated coordinate with or without further micro-siting provision.

10.11 Conclusions

A series of environmental studies have assessed the proposed wind turbine and met mast at Drummick, Glenalmond, Perth. The findings demonstrate that there are no overriding environmental constraints or planning policies which would preclude the development of the application site for wind energy. All aspects of the design have taken full account of the environmental opportunities and constraints present and, where necessary, mitigation measures form an integral part of the proposals to ensure that the environment is suitably protected.

In summary, it is considered that the development proposals are acceptable in principle within the open countryside as the proposals are for a temporary period of 25 years where after the site may be reverted back into full agricultural use if it is the wish of the LPA.

The landscape and ecology considerations have been assessed and it has been demonstrated that any impact on these would be negligible due to the suitable positioning of the turbine within an area that is not environmentally sensitive to renewable energy developments.

The proposals are consistent with national, regional and local planning policy and any potentially adverse impacts have been carefully considered in the preparation of the development proposals.

This comprehensive assessment therefore demonstrates how the proposed scheme would bring about significant benefits by providing renewable energy generation in a sustainable location.

TCP/11/16(205)

Planning Application 12/00401/FLL – Erection of a wind turbine and an anemometer mast on land 550 metres south west of Drumick Farm, Glenalmond

PLANNING DECISION NOTICE *(included in applicant's submission, see pages 949-950)*

REPORT OF HANDLING

REFERENCE DOCUMENTS *(included in applicant's submission, see pages 963-1464)*

REPORT OF HANDLING

DELEGATED REPORT

Ref No	12/00401/FLL
Ward No	N9- Almond And Earn

PROPOSAL: Erection of a wind turbine

LOCATION: Land 550 metres South West of Drummick Farm, Glenalmond

APPLICANT: Clearwinds Limited

RECOMMENDATION: Refuse

SITE INSPECTION: 12 April 2012

OFFICERS REPORT:

SITE DESCRIPTION

The application site relates to an area of open rural agricultural land located approximately 550 metres south west of Drummick Farm, between Glenalmond to the north and Keillour to the south east. To the south of the site lies Gorthy Wood and immediately to the south west there is a small, isolated cluster of woodland. To the east lies an unclassified Keillour - Glenalmond road from which an unmade farm track presently affords access to the site.

The area lies relatively close to several settlements, but only scattered dwellings lie within a 1 km radius of the proposal site. The nearest houses at Drummick Farm Cottages (north east) and Sluidubh (south east) are located approximately 500m and 600m respectively.

PROPOSAL

This planning application seeks detailed planning permission for the erection of one commercial scale wind turbine, with a hub height of 50 metres, a rotor diameter of 54 metres and a maximum blade tip height of approximately 77 metres. The turbine will be a three blade version, with a generating capacity of approx 900kW. In addition to the turbine itself, the development also includes the erection of a small ancillary sub-station and improvements to the existing access track.

The proposals also include the erection of an anemometry mast up to 50m height. This mast will be erected for a temporary period of 18 months in order to monitor and record wind speeds prior to the construction of the turbine.

The proposed turbine will have a lifespan of 25 years, after which it is assumed that the turbine and all other development will be removed, and the site reinstated back to its current state unless a further application is submitted to replace the wind turbine with new equipment.

PROCEDURAL

Due to the development falling within schedule 2 of the Environmental Impact Assessment (Scotland) Regulations 1999 under Part 3 Energy Industry the Planning Authority took account of the criteria contained within the EIA Regulations and adopted a screening opinion that an EIA was not required. This Screening Opinion should not be taken as implying that the planning authority considers this to be an acceptable development but that the environmental impacts for the scale of the development can be considered adequately in the assessment of the Planning Application.

APPRAISAL

Sections 25 and 37(2) of the Town and Country Planning (Scotland) Act 1997 (as amended by the 2006 act) requires the determination of the planning application to be made in accordance with the provisions of the Development Plan, unless other material considerations indicate otherwise. The Development Plan for the area comprises the approved Perth & Kinross Structure Plan 2003 and the adopted Strathearn Area Local Plan 2001.

In terms of the Structure Plan, Policies *SEP3, ERP2, ERP4, ERP8 and ERP 14* are all directly applicable to the proposal, as are Policies *1, 2, 3, 11, 17 and 24* of the Local Plan.

SEP 3 of the Structure Plan offers support in principle for rural proposals which encompass social and environmental considerations, whilst ERP 4 of the Structure Plan states that the TLCA will be material consideration in the determination of planning applications.

ERP 2 of the Structure Plan and Policy 17 of the Local plan, both seek to protect protected species from new developments.

ERP 14 of the Structure Plan and Policy 11 of the Local Plan both offer encouragement (in principle) for renewable projects, providing designated sites or local environment quality are not adversely affected by the development which is proposed.

Policy 1 of the Local Plan promotes sustainability, whilst Policy 2 of the Local Plan seeks (amongst other things) to ensure that all new developments within the landward area have a suitable landscape framework which is capable of absorbing the development which is proposed, and to ensure that new developments will not have an adverse impact on the character of the existing landscape. Policy 2 also seeks to protect the amenity of existing areas.

Policy 3 of the Local Plan seeks to ensure that local landscapes are not adversely affected by new proposals, whilst Policy 24 of the Local Plan and ERP 8 of the Structure Plan both seek to protect cultural heritage assets.

In terms of other material considerations, this principally includes an assessment against national planning guidance in the form of the Scottish Planning Policy and consideration of the TLCA and Policy ER1: Renewable and Low Carbon Energy Generation identified in '*Perth and Kinross Council Local Development Plan – Proposed Plan January 2012*'.

Accordingly, based on the above, I consider the key determining issues for this proposal to be a) whether or not the proposal (by virtue of its siting and height) will

have an unacceptable impact on the landscape / visual amenity of the area, b) whether or not the proposal is compatible with the surrounding land uses, c) whether or not there will be an adverse impact on any protected species and / or habitats and d) whether or not the proposal will adversely affect any cultural heritage assets, bearing in mind the provisions of the Development Plan and other material considerations.

I shall address these issues in turn, starting with assessment of visual impact.

Visual impact

In terms of renewable proposals, Policies ERP 14 of the Structure Plan and Policy 2 of the Local Plan seek (amongst other things) to ensure that amenity of existing areas are not adversely affected by new developments. In terms of amenity, I consider *visual* amenity as something which these policies seek to protect.

Although the area is not specifically protected by any formal designation, the local area does have a degree of high amenity value for both its residents and users. Glenalmond College lies to the north and to the north west lies the colleges own golf course, designed by James Braid. Whilst the intervening landscape and tree cover will provide a degree of screening, it is likely that the turbine will still be visible to some extent. The immediate area surrounding the proposed site is also popular with walkers with a network of paths within woods to the south and east.

The photomontages that have been submitted in support of the proposals are not particularly clear, perhaps not assisted by the weather conditions. The chosen positions of some of the viewpoints are also not ideal, particularly in regards to viewpoint 11 from Harrietfield where a house blocks any view of the proposed turbine. The Council's Landscape Architect has also advised that the viewpoints are located very sparsely and mainly focus on views of the proposed turbine from long distances and at close proximity. He also advised that the middle distance views of the turbine are poorly represented. Nevertheless it is considered that the photomontages do illustrate that the turbine will have a significant presence in the landscape.

The applicants supporting statements tend to play down the visual significance of the turbine, describing the impact of the turbine at close proximity as being slightly different to the one at present. It is also suggested that the nearby pylons and transmission lines provide a vertical context for the proposed turbine. However having assessed the proposals and visited the site I consider that the proposed turbine will have a significant visual impact on the immediate area. Whilst I accept that the existing pylons provide a degree of vertical development, these pylons are significantly smaller than the proposed turbine and it would be misleading to consider that a lattice type structure with no moving parts could be comparable to a large commercial turbine with moving rotor diameter of 54 meters. The viewpoint analysis also describes significant visual effects arising from the proposed development at properties at viewpoints 8 and 9.

It should also be noted that the Council's Supplementary Planning Guidance guideline 2 states that *'a commercial or community wind farm, cluster or turbine is unlikely to be acceptable within 20 times the height to blade tip of: houses and settlements, locally prominent landforms...'* In this instance the proposed turbine has an overall height of 77m which under this guideline would require a separation distance of 1540m. As previously noted there are a number of properties within this distance which could be negatively affected by the proposals.

In addition, it is worth noting that although the current potential visibility of the turbine is screened to some extent by existing commercial plantations in several directions, some of these plantations appear to be outwith the control of the applicant and could, in theory be felled at any point during the lifespan of the turbine (circa 25 years). There is therefore the potential for the visibility of the turbine to increase over the length of the consent, however conversely although there is a degree of probability that visibility may increase during the 25 year life span there is no guarantee regarding the magnitude of level of change.

I therefore consider the proposal to potentially have a significant detrimental impact on the visual amenity of the area, and accordingly I consider the proposal to be contrary to Policy 2 of the Local Plan, and Environmental Resource Policy 14 of the Structure Plan, both of which seek to ensure that local amenity / environmental quality is protected.

Landscape Impact

Turning to the wider landscape impact, in terms of renewable developments, Policies 2, 3 and 11 of the Local Plan and ERP 14 of the Structure Plan seek similar key objectives with regard to protecting the landscape, i.e. restrict renewable developments within the landward area if the proposal would have an adverse, negative impact on the landscape of the area concerned.

In considering the impact on the landscape character, the Tayside Landscape Character Assessment 1999 (TLCA) is a material consideration. Within the TLCA the application site lies within the Lowland Hills classification.

These Lowland Hills form the transition between the Highlands to the north and west and the lowlands to the south and east. The Key characteristics are:

- low ridges and hills separating lowland straths and adjoining the nearby uplands
- composed of soft, red sandstones
- transitional character with pastures on lower slopes, giving way to rough grazing and even open moorland
- evidence of several phases of historic settlement
- extensive woodland, including forestry plantations
- influence of modern development

The Landscape Character Assessment specifies that a small scale, wind power has been important in this area for many decades, being harnessed by wind pumps to raise water. With the development of modern wind turbines to generate power, it is possible that this area may come under pressure for wind farm development. Though wind speeds are likely to be significantly lower than in more elevated parts of the Highlands or the Sidlaws/Ochils, it is possible that the lower level of perceived constraint, together with the proximity to the existing electricity distribution network, could favour this area. This would be even more likely if the efficiency of wind turbines continues to improve, thereby making areas with lower wind speeds viable.

It is acknowledged that development here could avoid the need to locate turbines in even more sensitive upland areas or in less sensitive, but more populated areas closer to settlements. It would also mean that, from a distance, and from some directions, turbines would be viewed against a backdrop of higher ground. However, the insensitive development of wind turbines in this area could conflict with the small-scale, historic and deeply rural character of the landscape. It would also weaken and

confuse the area's role of providing a transition from the unsettled uplands to the fertile and settled lowland.

In addition to the TLCA, the Council's own finalised report '*Landscape Study to Inform Planning for Wind Energy, November 2010*' (LSIP) prepared by David Tyldesley and Associates is of interest in assessing the landscape impact of this proposal.

The proposed site is identified in this report as being located within an area of Lowland that is sensitive to large scale development such as wind turbines due to the proximity of the Highland Boundary Fault. The Highland Boundary Fault is a significant landscape feature in this area which marks the stark transition from the Lowlands to the Highlands. Within the LSIP under 'Landmark Landscape Features' (Para 4.24) it specifically recognises that: '*Landmark landscape features ought not to be affected by the construction of wind farms, or indeed any other large scale form of built development, in ways that would alter their landmark qualities. For example, the Abercairney and Logiealmond wind farms were refused planning permission partly on the basis of their impact on the Highland Boundary Fault.*' The document also states that the Highland Boundary Fault is a linear feature which is sensitive to wind farms located on its top and also to turbines located in front of the fault or on the fault slope itself and suggests that a 'buffer' of '*say 2+km Highlands-ward, and say 5+km Lowlands-ward, may be necessary to safeguard the landmark qualities of the feature and its setting*'.

Upon visiting the site and considering the scale of the proposals it is considered that the proposals, by virtue of its large scale and sensitive location, would have a significant adverse impact on not only the immediate landscape but also the setting Highland Boundary Fault. The turbine would be set in the foreground of the HBF, potentially diluting the significance of this important landscape feature by introducing a new, large scale man made feature into the landscape.

Cumulative Impact

The applicant has provided a number of wireframes demonstrating the potential cumulative impact along side the following developments:

- Burnfoot Wind Farm (13 turbines, 100m)
- Green Knowes Wind Farm (18 turbines, 98.5m)
- Lochelbank Wind Farm (12 turbines, 91m)
- Griffin Wind Farm (68 turbines, 124m)
- Stewart Tower (1 turbine, 47.5m)
- Calliacher (14 turbines, 109.9m)

The applicant has assessed that the proposed turbine will not have a significant cumulative impact in relation to the above developments. Having assessed the wireframes I would also share this view given the distances between the developments and location of the proposals. However the applicant has not taken into consideration the potential cumulative impact of the turbine along with the proposed wind farm at Mull Hill, approximately 5km west of the site. The proposals at Mull Hill comprise of 9 commercial turbines with a height of 104m to blade tip. Whilst this is currently an undetermined planning application, in cumulative terms the two proposals could have a significant impact on views of the Highland Boundary Fault. As such the applicant should also assess the potential cumulative impact of the Mull Hill proposals.

Compatibility with Existing land uses

In regards to compatibility with existing land uses, Policy 2 of the local plan seeks to ensure that all new developments are compatible with existing land uses. I have no concerns regarding the impact that the turbine will have on the commercial activities of the land, and in terms of the impact on any existing residential properties, it is noted that the closest residential property is approx 500m from the site. My Environmental Health colleagues have commented on the proposal and have raised no concerns regarding noise related issues. The principal conflict with the existing neighbouring properties would be the potential visual impact and this matter has been covered in the previous section.

Protected Species / Habitats

The site is not protected by any specific designation and under the SNH guidance the site is identified as being located within the lowest zone of natural heritage sensitivity. Nevertheless this does not necessarily indicate that the proposed development would not impact on protected wildlife and it is important to consider the wider impact the development could have on local wildlife interests.

In recognition of this the applicant has undertaken an extended phase 1 habitat survey of the site in order to assess the conservation value of the survey area, the likely presence of rare or protected and notable species, and to identify any features, habitats or species which would constitute potential constraints to the development. The survey findings generally conclude that the proposed development would not unduly affect wildlife in the immediate area and whilst there is always the potential for bird strikes, the likelihood of such occurrences would be relatively low.

I am therefore satisfied that the applicant has adequately assessed the potential impact on wildlife and consider the proposal to be consistent with the relevant Development Plan policies which relate to protected species / habitats, insofar as the proposal would not have a significant adverse impact on either element.

Cultural Heritage

There are a number of cultural heritage sites within a wide proximity to the site. The closest archaeology site is approximately 500m to the north west and the closest Scheduled Ancient Monument at Seat Knowe Cairn is around 2.7km to the south west. The closest listed building is the category C(s) listed West Tulcan Farmhouse located 1.2km to the north. The category C(s) listed Keillour Castle and its associated Designed Gardens are also located approximately 2.3km to the south east of the proposed site.

Having assessed the proposals it is considered that the turbine would be unlikely to have any significant impact on any sites of cultural interest. The existing intervening topography and woodland and the distances involved would not result in any major impact on the character or setting of the historic sites listed above. I therefore consider the proposal to be consistent with the relevant Development Plan policies with regard to cultural heritage.

Other Material Issues

- *Shadow Flicker*

As the closest residence is located approximately 500m away from the proposed turbine, I do not consider there to be any notable effects on residential amenity in terms of shadow flicker. I note that my EHO colleagues have also not raised any concerns on this topic.

- *Aviation Lighting*

The height and location of the proposed wind turbine has been assessed by the MOD and they have advised that they do not object to the proposed turbine. They have however requested that in the interests of air safety, the turbine is fitted with aviation lighting. In addition, they have also requested that if planning permission is granted the following information is provided to the MOD:

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

- *Noise*

As previously highlighted, there are a number of residential properties in relative close proximity to the proposed turbine. It is therefore possible that noise from the operation of the turbine could impact on neighbouring residential amenity.

In order to consider the impact of the proposed turbine on the surrounding area and nearby residential dwellings the applicant has submitted a Noise Assessment. This assessment predicts that the noise levels at Drummick Farm House to be 34.4dB(A) at wind speed 10m/s and 32.8dB(A) at Sluidubh Farm House. The Environmental Health Officer has advised that these levels are below the 35 dB L_{A90}, 10min threshold recommended by ETSU-R-97.

As such, it is considered that the predicted noise levels from the proposed turbine will not unduly impact on the nearest neighbouring properties.

- *TV reception*

In the event that a review to the LRB is successful, an appropriately worded condition could be attached to the consent which would provide mitigation measures for any person(s) affected directly by this proposal.

- *Road / Access Issues*

The applicant has undertaken an assessment of the existing road infrastructure and identified a proposed access route for the delivery of the turbine and associated construction traffic.

It is estimated that the proposed turbine would take three months to construct, during which it is predicted that it would generate around 279 HGV movements. This would give a 2-way movement of 558. It is also considered that the most frequent periods for HGV movements will be during the first two weeks and then in week 5. During these two periods it is anticipated that there would be 18 HGV movements per day which would represent a 40% increase in the flow of HGVs on the A822. However the overall increase in traffic flow based on the total HGV movement (279) will be less than 2%.

In regards to the access route, it is proposed that construction traffic will follow the A85 from West Huntingtower until Gilmerton, then follow the A822 northward onto a C classified road towards Glenalmond and turn right at East Tulcan onto another C classified road that will provide access to the site near Drummick Farm. The Transport Report has identified a number of points where localised road widening will need to be undertaken to allow for the abnormal load movements required for the delivery of the turbine components.

The Council's Roads Engineer has advised that the proposed route appears to be acceptable and whilst there will be an increase in HGV movements during the construction phase, it is accepted that the overall increase should not unduly impact on traffic safety. However further detail would be required regarding the proposed works to the public road and the reinstatement works thereafter, particularly near East Tulcan but this could be covered by appropriately worded conditions.

- *LRB / Conditions*

In the event that this planning application is presented to the LRB for review, it is requested that the Planning Service have an opportunity to recommend conditions. The Council now has a number of standard conditions which it would consider appropriate, and it is envisaged that a number of site specific conditions may also be necessary.

Conclusion

Whilst the principle of renewable energy is broadly supported by the Scottish Government through its planning policies and guidance, it is considered that in this instance the power generation and reduction of CO2 emissions do not outweigh the adverse landscape and visual impacts. As such this planning application is recommended for refusal, based on the likely visual impact on the surrounding sensitive landscape.

NATIONAL PLANNING GUIDANCE / POLICIES

The Scottish Government expresses its planning policies through The National Planning Framework 1 & 2, the Scottish Planning Policy (SPP), Planning Advice Notes (PAN), Designing Places, Designing Streets, and a series of Circulars.

The Scottish Planning Policy 2010

This SPP is a statement of Scottish Government policy on land use planning and contains:

- the Scottish Government's view of the purpose of planning,
- the core principles for the operation of the system and the objectives for key parts of the system,
- statutory guidance on sustainable development and planning under Section 3E of the Planning etc. (Scotland) Act 2006,
- concise subject planning policies, including the implications for development planning and development management, and
- the Scottish Government's expectations of the intended outcomes of the planning system.

Of relevance to this application are,

- Paragraphs 182-186 which relate to renewable energy
- Paragraphs 92-97 which relates to rural development

PAN - 1/2011: Planning & Noise

This Planning Advice Note (PAN) provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. It supersedes Circular 10/1999 *Planning and Noise* and PAN 56 *Planning and Noise*. Information and advice on noise impact assessment (NIA) methods is provided in the associated Technical Advice Note. It includes details of the legislation, technical standards and codes of practice for specific noise issues.

DEVELOPMENT PLAN

The Development Plan for the area comprises the approved Perth & Kinross Structure Plan 2003 and the adopted Perth Area Local Plan 1995.

Perth & Kinross Structure Plan 2003

Sustainable Economy Policy 3 states that support will be given to measures which promote an integrated flexible and innovative approach to rural development which encompass economic, social and environmental considerations and which:

- maintain or enhance local employment opportunities.
- promote diversification.
- help sustain viable rural communities and services.

Environment and Resources Policy 2 states that the protection and conservation of wildlife, habitats and other natural features will be supported.

Environment and Resource Policy 4 states that the TLCA will be a material consideration in the assessment of development plans.

Environment and Resource Policy 8 seeks to protect cultural heritage sites from inappropriate development

Environment and Resources Policy 14 states that proposals for the development of renewable energy schemes will be supported where they are considered environmentally acceptable and where their energy contribution and benefits in reducing pollution outweigh any significant adverse effects on local environmental quality. Community based renewable energy developments in particular will be encouraged. Proposals for renewable energy schemes will be assessed against the following criteria:

- The immediate and wider impact of the proposed development on the landscape and wildlife resource.
- The need to protect features and areas of natural, cultural, historical and archaeological interest.
- The specific benefits that the proposal would bring to the local community and/or Perth and Kinross.
- The cumulative effects of similar developments on the local area.

An environmental assessment will normally be required for large-scale schemes and Local Plans will provide more detailed locational guidance particularly for windfarm developments and other renewable energy technologies.

Strathearn Area Local Plan 2001

Within the Local Plan the site lies within the landward area, where the following policies are directly applicable.

Policy 1 (sustainable development) seeks to ensure that new, that development within the Plan area is carried out in a manner in keeping with the goal of sustainable development. Where development is considered to be incompatible with the pursuit of sustainable development, but has other benefits to the area which outweigh this issue, the developer will be required to take whatever mitigation measures are deemed both practical and necessary to minimise any adverse impact. The following principles will be used as guidelines in assessing whether projects pursue a commitment to sustainable development:

- (a) The consumption of non-renewable resources should be at levels that do not restrict the options for future generations;
- (b) Renewable resources should be used at rates that allow their natural replenishment;
- (c) The quality of the natural environment should be maintained or improved;
- (d) Where there is great complexity or there are unclear effects of development on the environment, the precautionary principle should be applied;
- (e) The costs and benefits (material and non-material) of any development should be equitably distributed;
- (f) Biodiversity is conserved;
- (g) The production of all types of waste should be minimised thereby minimising levels of pollution;
- (h) New development should meet local needs and enhance access to employment, facilities, services and goods.

Policy 2 (Development Criteria) states that all developments will also be judged against the following criteria (amongst other things)

- The sites should have a landscape framework capable of absorbing or, if necessary, screening the development and where required opportunities for landscape enhancement will be sought;
- In the case of built development, regard should be had to the scale, form, colour, and density of existing development within the locality;
- The development should be compatible with its surroundings in land use terms and should not result in a significant loss of amenity to the local community;

- The road network should be capable of absorbing the additional traffic generated by the development and a satisfactory access onto that network provided;
- The site should be large enough to accommodate the development satisfactorily in site planning terms;

Policy 3 (Landscape) states that development proposals should seek to conserve landscape features and sense of local identity, and strengthen and enhance landscape character. The Council will assess development that is viewed as having a significant landscape impact against the principles of the Tayside Landscape Character Assessment produced by Scottish Natural Heritage

Policy 11 (Renewable Energy) states that the Council will encourage, in appropriate locations, renewable energy projects. Such developments, including ancillary transmission lines and access roads, will be assessed against the following criteria:

- (a) The development will not have a significant detrimental effect on sites recognised by designation at a national, regional or local level, of nature conservation interest or sites of archaeological interest;
- (b) The development will not result in an unacceptable intrusion into the landscape character of the area;
- (c) The development will not result in an unacceptable loss of amenity to neighbouring occupiers by reasons of noise emission, visual dominance, electromagnetic disturbance or reflected light.

Developers will be required to enter into an agreement for the removal of the development and the restoration of the site following the completion of the development's useful life.

Policy 17 (Habitats) states that the Council will seek to protect and enhance habitats of local importance to nature conservation, including grasslands, wetlands and peatlands, habitats that support rare or endangered species, together with those habitats associated within the Earn and Almond river systems in the Plan area.

Policy 24 (Archaeology) states that the Council will seek to protect unscheduled sites of archaeological significance and their settings. Where development is proposed in such areas, there will be a strong presumption in favour of preservation in situ. Where, in exceptional circumstances, preservation of the archaeological features is not feasible, the developer, if necessary through appropriate conditions attached to planning consents, will be required to make provision for the excavation and recording of threatened features prior to development commencing.

OTHER POLICIES

Perth and Kinross Council Local Development Plan – Proposed Plan January 2012

The Council's Development Plan Scheme sets out the timescale and stages leading up to adoption. Currently undergoing a period of representation, the Proposed Local Development Plan may be modified and will be subject to examination prior to adoption. This means that it is not expected that the Council will be in a position to

adopt the Local Development Plan before December 2014. It is however a material consideration in the determination of this application.

Policy ER1A: New Proposals

Proposals for the utilisation, distribution and development of renewable and low carbon sources of energy, including large-scale freestanding installations, will be supported where they are well related to the resources that are needed for their operation. In assessing such proposals, the following factors will be considered:

- a. The individual or cumulative effects on biodiversity, landscape character, visual integrity, the historic environment, cultural heritage, tranquil qualities, wildness qualities, water resources and the residential amenity of the surrounding area.
- b. The contribution of the proposed development proposed meeting carbon reduction targets.
- c. The connection to the electricity distribution or transmission system.
- d. The transport implications, and in particular the scale and nature of traffic likely to be generated, and its implications for site access, road capacity, road safety, and the environment generally.
- e. The hill tracks and borrow pits associated with any development.
- f. The effects on carbon rich soils.
- g. Any positive or negative effects they may have on the local or Perth and Kinross economy either individually or cumulatively.
- h. The reasons why the favoured choice over other alternative sites has been selected.

Supplementary Planning Guidance for Wind Energy Proposals in Perth and Kinross, Approved 18th May 2005

The purpose of this policy and guidance note is to enable the wind energy industry to expand, but not at the cost of the natural and built environment.

Landscape Study to Inform Planning for Wind Energy, Finalised Report November 2010

The purpose of this study is to assist Perth and Kinross Council in the preparation of policy guidance relating to planning for wind energy developments, in accordance with *Scottish Planning Policy* (2010).

Tayside Landscape Character Assessment 1999 (TLCA)

This document provides guidance on the various different landscape types throughout the Tayside region and also assists in identifying whether a development can be accommodated with certain landscape.

SITE HISTORY

No recent planning history

CONSULTATIONS/COMMENTS

Ministry Of Defence

No objection but advised that in the interests of air safety, the turbine is fitted with aviation lighting

Environmental Health	No objection subject to condition regarding noise levels
David Williamson	No comments received

TARGET DATE: 26 May 2012

REPRESENTATIONS RECEIVED:

Number Received: 18

Summary of issues raised by objectors:

- Visual Impact
- Set a precedent for further turbines
- Impact on wildlife
- Impact on setting on the listed Glenalmond College and the golf course
- Photomontages submitted are misleading and of a poor quality
- Lack of public consultation
- Inadequate road infrastructure for access
- Noise
- Impact on tourism

Response to issues raised by objectors:

See report

Additional Statements Received:

Environment Statement	Not required
Screening Opinion	A screening exercise has been undertaken by the Council which concluded the proposal was not an EIA development.
Environmental Impact Assessment	Not required
Appropriate Assessment	Not required
Design Statement / Design and Access Statement	Submitted
Report on Impact or Potential Impact	Submitted

Legal Agreement Required: No

The applicant has submitted a draft heads of terms for a Section 75 legal agreement. However the terms of the proposed legal agreement are not considered to be a material consideration of this planning application as they large relate to the potential financial benefits afford to a limited number of nearby private residences. This type of legal agreement would best be dealt with separately from the planning process. As such no legal agreement is required in this instance.

Direction by Scottish Ministers

None

RECOMMENDED REASONS FOR REFUSAL

- 1 As the proposed turbine will have a significant adverse impact on the visual amenity of the area, which is presently enjoyed by a host of receptors including (but not exclusively) existing residential properties and visiting recreational users, the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (visual) amenity from new developments within the landward area, and Environmental and Resource Policy 14 of the Perth and Kinross Structure Plan 2003 which seeks to protect existing local environmental quality from inappropriate renewable energy developments.
- 2 As the proposed turbine will potentially have a significant adverse impact on the residential amenity of existing residential properties (by virtue of the turbines appearance and scale when viewed from their properties), the proposal is contrary to Policy 2 of the Strathearn Local Plan 2001, which seeks to protect existing (residential) amenity from new developments within the landward area.
- 3 The approval of this proposal would establish an undesirable precedent for similar sized developments within the local area, which would be to the detriment of the overall visual character of the area, and which in turn could potentially undermine (and weaken) the established Development Plan relevant policies.

JUSTIFICATION

The proposal is not in accordance with the Development Plan and there are no material reasons which merit approval of the planning application.

TCP/11/16(205)

Planning Application 12/00401/FLL – Erection of a wind turbine and an anemometer mast on land 550 metres south west of Drumick Farm, Glenalmond

REPRESENTATIONS

- Representation from Environmental Health Manager, dated 12 April 2012
- Objection from Mr J Hughes, dated 17 April 2012
- Objection from Methven and District Community Council, dated 17 April 2012
- Objection from Professor G Pawley, dated 18 April 2012
- Objection from Ms A Willis, dated 18 April 2012
- Objection from Mr N McKinnon, dated 18 April 2012
- Objection from Mr S Hamilton, dated 18 April 2012
- Objection from Mr and Mrs Jenkins, dated 18 April 2012
- Objection from Mr V Roberts, dated 18 April 2012
- Objection from Mrs S McKinnon, dated 18 April 2012
- Objection from Ms M Orgill, dated 18 April 2012
- Objection from Ms H Harward-Taylor, dated 19 April 2012
- Objection Mrs A Cowan, dated 19 April 2012
- Objection from Mr K Montgomery on behalf of Glenalmond College, dated 19 April 2012
- Objection from Mrs M Beaumont on behalf of East Strathearn Community Council, dated 19 April 2012
- Objection from Mrs M Beaumont, dated 19 April 2012
- Objection from Mrs M Beaumont on behalf of the Sma' Glen Protection Group, dated 19 April 2012
- Objection from Mr T Wright, dated 20 April 2012

- Objection from Ms S St.John, dated 20 April 2012
- Objection from Ms C Blackler, dated 20 April 2012
- Representation from Mrs M Beaumont on behalf of East Strathearn Community Council and the Sma' Glen Protection Group, dated 5 September 2012
- Representation from Mr T Wright, dated 7 September 2012
- Representation from Ms C Blackler, dated 11 September 2012

Memorandum

To	Development Quality Manager	From	Environmental Health Manager
Your ref	PK12/00401/FLL	Our ref	NK
Date	12 April 2012	Tel No	(01738) 476 444

The Environment Service

Pullar House, 35 Kinnoull Street, Perth PH1 5GD

Consultation on an application for Planning Permission

PK12/00401/FLL RE: Erection of a wind turbine and an anemometer mast Land 550 Metres South West Of Drummick Farm Glenalmond for Clearwinds Limited

I refer to your letter dated 30 March 2012 in connection with the above application and have the following comments to make.

Recommendation

I have no objection in principle to the application but recommend the under noted condition be included on any given consent.

Noise

The applicant seeks consent to install a single Enercon E53 800kW wind turbine with a 77m hub height. This is only a single turbine but it is considerably larger than other single turbine applications. There are two residential properties located 500 metres from the turbine (Drummick Farm Cottage and Drummick Farm House) and further residential properties at Sluidubh (Stroness House and Sluidubh Farm House) located at 570 metres and Tulchan Cottage at 650metres.

It is therefore possible in principle for a wind turbine, installed at this location, to comply with the simplified noise condition for single turbines as recommended by Planning Advice Note (PAN) 45.

An Environmental Noise Assessment has been submitted by Hayes McKenzie Partnership Ltd, carried out in accordance with The Assessment and Rating of Noise from Wind Farms (ETSU-R-97).

The report predicts noise levels at Drummick Farm House to be 34.4dB(A) at wind speed 10m/s and 32.8dB(A) at Sluidubh Farm House. These levels are below the 35 dB L_{A90}, 10min threshold recommended by ETSU-R-97. This information can be found at section 7 Noise, subsection 4.14 (page 13 of 17).

Condition

- Noise arising from the wind turbine shall not exceed an L_{A90}, 10 min of 35 dB at the nearest noise sensitive premises at wind speeds not exceeding 10m/s, and measured at a height of 10m above ground at the wind turbine site, all to the satisfaction of the Council as Planning Authority. In the event that audible tones are generated by the wind turbine, a 5dB(A) penalty for tonal noise shall be added to the measured noise levels.



Mr John Hughes (Objects)

Comment submitted date: Tue 17 Apr 2012

A single large industrial sized turbine, clearly visible from the A85 tourist route from Dundee to Oban in an undisturbed wild area just on the Highland Line is an obtrusion too far and unacceptable.

It is an unacceptable proposal in the area between the Rivers Almond and Earn and the Pow. This whole area of the Highland edge must be kept clear of intrusive and unsightly - and may it be said - inefficient over subsidised turbines.

Are there rules built in to the planners' consideration of this application as to when inefficient, exhausted turbines have a defined period of life and who is responsible for their removal after say 25 years of doubtfully useful life?

Who benefits from this proposed installation?

Site access must be a major issue and no doubt this clearly open area of countryside abounds in bird and wild life that will be endangered in all the development and building and operational stages of the proposed turbine.

Most importantly is that the authorities decide on a plan as to where renewable projects could be established and that this willy-nilly approach to where renewable projects may be considered appropriate should be according to an agreed national plan.

John Hughes
Bellevue
By Crieff
PH7 3QS

From: The Pearsons
Sent: 17 April 2012 16:55
To: Development Management - Generic Email Account
Cc: Neil Mckinnon
Subject: Wind farm at Drummick ,Glenalmond. -- Ref 12/00401/FLL, --
Objection

Methven & District Community Council has examined this application and requests that it be refused.

The location is a sensitive area on the hill between Strathearn and Glenalmond . It forms the foreground of the outstanding view northwestwards from the public road , on the hilltop north of Drummick farm, towards the mouth of the Sma' Glen. The Glen is renowned for its outstanding landscape character, and this includes the experience of passing through it, but also key views towards it -- of which this is one of the best from a public road.

The locality is part of the Highland Boundary, and is a significant as a recreational landscape , as recognised recently in the Abercairney Wind farm Inquiry about 5 years ago. While the A822 and the B8063 are important recreational routes for residents and visitors through and to the Sma' Glen, the smaller roads running north from the A85 are used by many ; the Keillour - Drummick - Tulchan road has the useful Forestry Commission car park south of Sluidubh, which attracts walkers, cyclists and riders. However, the Drummick viewpoint, as described above , is arguably the most outstanding scene, and should be protected from this proposal, which would sit in the foreground of the view.

Whatever the alleged merits of windfarms, we believe that this location is unacceptable because of the impact the 77metre turbine would have on the view to the Sma' Glen. We note that the Proposed Local Plan contains policies to protect the landscapes around major resorts (POL ED5, POL ER6) such as Crieff , and we consider that the current application is far too intrusive, and would , if approved, seriously damage the scene.

Please refuse this application.

Peter Pearson
Chairman

Professor FRSE FRS Godfrey STUART PAWLEY (Objects)

Comment submitted date: Wed 18 Apr 2012

I took trouble to make a reasoned comment, but you timed me out - not an acceptable procedure. This is a false application as it is a precursor (surely?) for a larger application for many turbines, much larger than any in the neighbourhood, encroaching towards Sma Glen. It is probably in a poorer site than those on higher ground, so the anemometer should be the only object of an application. The efficiency will be much less than off-shore sites, and will therefore take a very long time to yield energy equivalent to the fossil fuel energy spent in construction and installation. It therefore will make no contribution whatsoever towards reducing greenhouse gases, but will simply be a grabbing of public money.

Ms Anne Willis (Objects)

Comment submitted date: Wed 18 Apr 2012

This is not a suitable site for a wind turbine , - it is in the midst of a farming area.

The positioning of a structure of such height will affect birds , and other wildlife .

The current tourist trade will be affected by the sight of such a structure.

The adjacent roads are small country roads access to this structure will impact on current traffic routes.

The benefit to be gained from the expected power to be generated will not offset the impact of this plan on the local environment .

From: Neil Mckinnon
Sent: 18 April 2012 17:47
To: Development Management - Generic Email Account
Subject: Urgent.(Closing date for submission is the 20th April) Re Planning application 12/00401/FLL

For attention of the relevent department/person. I would be grateful of confirmation of receipt. Thanks,
Neil McKinnon. See postal address at the end of the submission.

Re: planning application 12/00401/FLL

Erection of a wind turbine and an anemometer mast on Land 550 Metres South West Of Drumick Farm,
Glenalmond, ,
for Clearwinds Limited
c/o Pegasus Planning Group
FAO Peter Atkin, Pegasus House, Querns Business Centre, Whitworth Road, Cirencester, GL7 1RT

I have examined this application and the Developers web site <http://www.clearwinds.co.uk> from which, in
formulating my objection, I highlight but one section:

"ClearWinds intends to be part of the solution; to operate sustainable wind energy projects that financially
benefit landowners and their communities while supporting government policy on renewable energy
development and rural economic diversification.

However I would urge all involved in the planning decision, not least councillors, to make a visit to their
web site and draw their own conclusions as to the real aims and real interests of this company.

In light of such I wish to **object**.

This proposal is nothing more than a self serving, money making venture by a wind farm company with
no long term links to the area, nor any real interest in speaking to or involving themselves with the
local community other than with the very few who may have vested interest in the development . As far as the
vast majority who live in the area are concerned,most of whom I have contacted directly and almost all
OBJECT..... there will be no benefits whatsoever.

As to be found on P&KC planning site.

List of Neighbours notified for 12/00401/FLL

Drummick Farm Cottage
Glenalmond
Perth
PH1 3SF

Drummick Farm
Glenalmond
Perth
PH1 3SF

The 50metre temporary anemometer mast and long term single 77metre to blade height windturbine , comes with the now very predictable and risable claim made by all windfarm developers these days, of helping government reach its renewable target and counter climate change. In this case it is claimed by the developer that this one turbine at Drummick will make" a valuable contribution towards legally binding renewable energy and CO2 targets" (See 7.3 of their Planning supporting statement) In terms of ammenity loss to the local community..... VALUABLE?? .

The turbine is to be constructed on a highly visible and prominent site in close proximity to a minor unclassified road ,which runs in a northerly direction from the main A 83 Crieff -Perth road ,past Keillor Castle, up and over the hill to the Parks of Keillor and on past a number of dwellings at Sluidubh and through the farm yard of Drummick Farm . The road then descends to the area known as East Tulchan. This is to the west of Trinity College Glenalmond and to the east of the world renowned salmond leap at Buchanty..

This is a regularly used recreational route for residents walkers, cyclists, horse riders and car drivers . On this minor road is to be found the Forestry Commission car park. Within a short distance north of the car park between Sluidubh and Drummick Farm can be seen the world renowned Sma Glen framed by the Logielmond hills to the north and Stroness point to the south west, This is one of the most expansive views of the Sma Glen to be found anywhere in the locality and will most certainly be impacted upon by a wind turbine of this scale. An even better view can be seen just past Drummick Farm as the road reaches it's highest point just before its descent toTulchan. Both views are well worth protecting.

I would also wish the following thought to be considered.

If the most recent proposal by the Abercairny Estate for a 9 turbine windfarm on Mull Hill in the vicinity of the Sma Glen were ever to gain approval(which I would hope it never will) this undoubtedly raises the matter of cumulative impact Do P&K councillors and planners really want to see this whole area industrialised in such a manner and becoming but one very large windfarm? I would hope not!

In that respect, I would also suggest re: this one turbine proposal at Drummick, the following question is in need of asking.

If this proposal were to be given the go ahead, will it be the precuser for yet more turbines on the site? Given the scale of this first turbine at 77m, and the very generous FITs and possibly even ROCs available, and the attitude of the developer involved, I have little doubt.

I would also be very interested „(...in being well acquainted with the roads of the area. !),..... to have clarification of the developers suggested route, as to how this turbine, given the nature and size of the component parts is going to be delivered to the site if the proposal were ever to be granted planning permission.

Neil McKinnon, Tulchan Garden Cottage, Glenalmond, Perth PH1 3SG.

From: Stewart Hamilton
Sent: 18 April 2012 20:31
To: Development Management - Generic Email Account
Subject:

Planning application number 12/00401/FLL

I am writing as a local resident and near neighbour of Drumick Farm, Glenalmond (Wester Campsie Farm, Glenalmond) and would like to object most strongly to the proposed erection of a 70 metre high wind turbine. Such a structure is totally out of keeping with the surrounding countryside and would destroy the most beautiful views. I also object to the fact that the company involved has given no possibility for community discussion of this project, merely giving notice to Drumick Farm of its intentions. The company is not locally based and are clearly out to make money at the expense of this local community.

Yours,

Stewart Hamilton

From: ALAN & HAZEL JENKINS
Sent: 18 April 2012 21:14
To: Development Management - Generic Email Account
Subject: Planning permission 12/00401/FLL

Sir,

I am writing to you as I have had difficulty using the PKC website to comment on the above planning application.

I object to this development in as many ways as you can imagine and probably more.

It is very easy to argue against wind turbines and not easy to justify them. This one in particular is too big and may well be the precursor to many more on the same site.

I am sure I need to say no more as it has all been said already.

Alan Jenkins

From: vaughn roberts
Sent: 18 April 2012 21:24
To: Development Management - Generic Email Account
Subject: Comments and Objection re 12/00401/FLL Drumick Farm Glenalmond.

Dear Sir/ Madam,

I write to outline my objection to the application for a wind turbine and mast at Drumick Farm , - for the following reasons , -

- * The height of the proposed mast is not acceptable within an environment such as this .
- * The surrounding roads are already in poor repair , and this will add to difficulties .
- * The impact of the wind turbine on wild life and birds will cause damage.
- * Local tourism will be affected by the sight of the turbine and mast .
- * This not a economic place from which to develop additional power for the grid , - as there will no space for expansion.
- * Despite being a neighbour of Drumick Farm I have received no notification about this application from Perth and Kinross Council , so do not consider that this process has followed the required planning procedures.

Yours
Sincerely

Mr Vaughn Roberts
East Tulchan Farm
Glenalmond
Perth
PH1 3SG

Tel No: 01738 880250

From: Sue Usher
Sent: 18 April 2012 22:18
To: Development Management - Generic Email Account
Subject: Re Planning application 12/00401/FLL

I would like to object to the proposal to erect a 77m wind turbine in the vicinity of Drummick Farm, Glenalmond, Perth.

Although Clearwinds Ltd. states, 'the site is not located within any area designated for their environmental sensitivity', it is a quiet rural area with land for sheep and cattle farming with access roads highly unsuitable for the modern agricultural machinery and certainly not suitable for the equipment required to transport a wind turbine of this enormity.

From this site one can view the Sma Glen and its surrounding area which is of outstanding beauty, it may not be designated but for those who live in its vicinity, cherish it and do not want to see the land and views desecrated by a wind turbine.

Mrs. Susan McKinnon,
Tulchan Garden Cottage,
Glenalmond.
Perth PH1 3SG.

-----Original Message-----

From: Margaret Orgill

Sent: 18 April 2012 23:27

To: Development Management - Generic Email Account

Subject: Objection to planning application at drumick/12/00401/FLL

Re planning application: 12/00401/FLL Erection of wind turbine and an anemometer mast/Land 550 metres South West of Drumick Farm Glenalmond

I am writing to this email having failed to register my objection on the planning site which was down today.

I would like to register that I object to this application for one wind turbine. It is quite clear from the scale of the turbine and also from the anemometer that this is not intended to stay a one turbine site. Once a planning application is allowed, more will be applied for. I would also like to register that the tactics used by companies are becoming more and more underhand. Local democracy seems to count for nothing, we are and have been inundated with these applications for years, with so many in this area and it is clear that no one wants them so close to family homes in the area. This site is totally unsuitable and will be a blot on the landscape for miles around. There is no benefit to the community, no benefit to the environment with just one (if it stays at one) and no benefit to anyone living in this area. It is purely a money making exercise for the landowner and for the company.

Please could you email back that you have received this and it has been noted.

Kind regards
Margaret Orgill
Annfield Cottage
Glenalmond

From: H HARWARD-TAYLOR
Sent: 19 April 2012 10:08
To: Development Management - Generic Email Account
Subject: Wind turbine at Drumick 12/00401/FLL

I wish to object strongly to a 77m turbine being put on this land . There may be a case for a local person erecting a turbine for their own use, this is nothing of the sort, an English company seeking to erect such a huge turbine with such a negative impact on our local area, this would make me feel it was a precursor to more.

This wild and beautiful area inhabited by a few is unable to provide high numbers of objections. I have a small B&B here which caters for visitors, they come to me for landscape,wildlife and peacefulness, these are to be found here and as I have said before, surely Perthshire has already taken well over it's fair share of turbines.

Hazel Harward- Taylor.

From: Ann Cowan
Sent: 19 April 2012 22:44
To: Development Management - Generic Email Account
Subject: Application Ref: 12/00401/FLL

Dear Sirs

I write to object to Planning application no: 12/00401/FLL.

I am having to use this method of objecting because the web site for the application states that the consultation time is over. However I understand that is not the case, as Friday 20th April is the closing date. I trust you will accept this letter of objection.

My objections are on the following grounds:

- 1) The site at Drumick Farm is on a hillside which is as yet totally unspoilt. The hills on the south side of the Strathearn Valley are already covered in wind turbines, but when looking to the north the hills that are visible are pristine. It would be a very unfortunate precedent to start to build wind turbines in this unspoilt area. Visit Scotland has said that it is more acceptable to have turbines grouped together in one area, rather than to have them scattered and spread out. This single turbine would go against that policy.
- 2) Visit Scotland have also said that turbines should be "sensitively sited". It would be most un-sensitive to start building turbines in this area, and would therefore go against their stated preference.
- 3) The site is on a farm. But at 77 metres high this is **not** a farm sized turbine. It is not "micro-generation" which is more usually about 20 metres high and therefore more acceptable on a farm. It is too large a turbine for this farm site.
- 4) There are dwellings relatively close to the proposed site. There is a family with young children living at Stroness House, and many other families with a mile or so at East and West Tulchan. Cairnies House at Glenalmond College is also too close. Close proximity is not just about visual amenity, it is also about noise and health reasons.
- 5) The application includes the anemometre. This should surely be applied for at least a year in advance of the application for the turbine. An anemometre is there to judge the wind speeds and frequency, and until that data is known no application for further development should be allowed.
- 6) In principal this is not a suitable place for a wind turbines, and it is known that power companies come back for further development once the principal has been established.
I would argue therefore that the principal should NOT be established. There are no other wind turbines between the Almond Valley and the Pow and the Earn Valley.
- 7) The local roads are not suitable for access to this site for such a large turbine, which will require very large transport vehicles.

I hope that for the above reasons this application will be refused.

Yours sincerely

Mrs Ann Cowan
The Old Inn
Fowlis Wester
Crieff PH7 3NL

From: Bursar (Facilities & Estates)

Sent: 19 April 2012 17:26

To: Enquiries

Subject: PLANNING APPLICATION WIND TURBINE AT DRUMMICK FARM REF 12/00401/FLL
[pfCase:1196595, pfTicket:6200495]

Please pass to the Planning Office

Dear Planning Officer,

I wish to make a complaint on behalf of Glenalmond College that an application for the erection of a wind turbine on Drummick Farm, Glenalmond has been made and it appears from your web site that the period for public consultation is now closed.

We received a call this morning from a neighbouring property in Glenalmond to inform us about this Planning Application but we did not receive any neighbourhood notification from P&K Council. As the land adjacent to Drummick Farm land is the College Golf Course (please note that the golf course sign has been omitted from the map on your website!), we feel aggrieved that we were not issued with a Neighbourhood Notification and that we have not been consulted on this matter.

On behalf of the College, I wish to object to the planned erection of a wind turbine as shown on the Planning Application documents for the following reasons:

- Proper consultation of neighbours was not conducted.
- The site and size of the mast will have a significant degrading effect on area of outstanding natural beauty.
- One of the USPs of Glenalmond College is it's marvellous setting in magnificent Perthshire countryside. This includes the College Golf Course which forms part of the College campus. The College attracts significant investment into the area. This is something that is recognised by the P&K Council Independent Schools Forum. This should not be jeopardised.
- The proposed wind turbine will be clearly visible from the Golf Course. Not only will a wind turbine spoil a beautiful location it will also present a hazard to golfers as a distraction from movement and glinting.

I very much hope that the lack of proper consultation and the potential effect on the natural environment, will mean that this application will be rejected by the Planning Committee.

Yours sincerely

Keith Montgomery

Planning Ref: 12/00401/FLL

East Strathearn Community Council have discussed the above application and wish to lodge an objection on the following grounds:

1. The proposed single turbine would provide an utterly discordant and alien element in a relatively open, rural landscape. As depicted in Photomontage 8, it would tower well above the trees and dominate the view north towards the Sma' Glen ridge, especially when it was a moving element in the view. It must also be borne in mind that trees are not permanent – when they are felled the turbine would become an even more dominant feature.
2. The location is a sensitive and open rural landscape, between Strathearn and the line of the Highland Boundary Fault – as Miss McNair pointed out in her Report of the Abercairny PLI – “ a landscape does not have to be designated to be worthy of protection”. This area is one of the few parts of Perthshire to remain turbine-free and we would suggest it should remain so.
3. If this application were to be granted, it would create a dangerous precedent and open the door to several more. If planners or elected members are in any doubt about this, they have only to read the public responses submitted by the applicant.
4. The access roads are incapable of accommodating traffic of the size or volume generated by a turbine of this size. We have grave doubts as to whether components could turn the corner at Gilmerton from the A 85 onto the A 822, and from there onwards the road becomes steadily more narrow.
5. We note the emphasis on potential contribution to national targets, but feel that, on balance, the negative environmental impact of a single turbine (77 metres high) in such a prominent rural location far outweighs any putative benefit it might provide.

For the above reasons, we respectfully request that the application be refused.

Mrs Maureen Beaumont (Chair)

Foulford
By Crieff
Perthshire
19/04/12

Planning Ref: 12/00401/FLL

I wish to object to the above planning application for the following reasons:

1. A turbine of 77 metres in height would pose an industrial and dominant element in a peaceful rural landscape. It would be absolutely out of place and out of scale. It is quite obvious that, were this application to be granted, others would immediately follow – either on the site or in the vicinity. Neighbours who completed the developer's survey – few though they are, admit as much.
2. This particular area of transitional landscape has, so far, remained free of wind farm development, largely thanks to the judgements of the Reporters at the Logiealmond and Abercairny PLIs. It ought to remain so – otherwise the whole of Highland Perthshire will become a landscape defined by electrical and industrial development, instead of being a haven for recreation and relaxation and an asset to our most important industry, tourism.
3. The site is an extremely sensitive one – it is very near the famous Glenalmond College campus and sports facilities, especially the golf course. It is also situated very close to one of the minor roads leading to the famous Sma' Glen, a very popular tourist destination. It may not be a designated landscape, but it is locally valued, and as such merits protection, as stated by Miss McNair at the Abercairny PLI, 2005.
4. The access to the site would be problematical in the extreme. The local roads network is very narrow, as evinced by problems with the traffic associated with the Beauldy-Denny OHL. It is uncertain as to whether the long loads would be capable of negotiating the turn at Gilmerton from the A85 onto the A822, far less the transfer onto the B8063.

5. I feel that the accompanying documentation is very repetitive, desk-based and I am unconvinced as to whether there has been any detailed investigation of a site-specific nature. There is a wealth of non-relevant information and very little attention has been paid to the neighbouring residents, of whom there are a considerable number. The photomontages are likewise, for the most part, taken from a considerable distance – and in the snow! Photomontages are notorious for distortion and these are very poor and taken from misleading locations. As for those taken nearer the site, it must be remembered that trees are not permanent structures. Throughout the documentation, adverse impacts are minimised and or dismissed – it is a very subjective statement, designed to justify an ill-conceived proposal and I am convinced that you, the planners, will recognise it as such.
6. The application is contrary to planning policy at all levels, in that the open landscape cannot accommodate such a tall turbine. Planning policy at all levels dictates that a site should be appropriate – this one is not for a commercial turbine of this height.
7. If this application were to be approved, it would create an unacceptable cumulative impact with the Mull Hill development, which has yet to be determined. It would also set a dangerous precedent for the whole area between the Almond and Strathearn. Perthshire has already made a sizeable sacrifice of its landscapes in the drive for renewable energy and surely ought to preserve at least these hillsides, along the Highland Boundary Fault : the Reporter at the Logiealmond PLI stated that this was a landscape of national significance.
8. The so-called community benefit element of the proposal is not material to the application.
9. The only justification for this project could be its contribution to national renewable energy targets. The figures quoted can only be an estimate, in that there is no verifiable site data and the load factor quoted is above the national average. According to the Aarhus Convention, (which applies to all EU

countries) it should be possible to calculate transparently any potential CO2 savings. This is not the case here. The meagre contribution made by this project could be made far more readily achieved by adding an extra turbine into an existing development, although this would deprive the developer and/or landowner of the income from the FITs and perhaps ROCs which make these developments so desirable.

This is a very visible site in a sensitive and valued landscape; the adverse impacts of the project far outweigh any benefits it might provide. For the reasons stated above, I respectfully request that the application be refused.

Maureen Beaumont.

Planning Ref: 12/00401/FLL

The Sma' Glen Protection Group has considered the above planning application and wishes to object for the following reasons:

1. The proposed turbine would provide a dominant alien and industrial element in an otherwise unspoilt area of rural Perthshire, near one of the approaches from the south to the iconic Sma' Glen. This area between the A 85 and the line of the Highland Boundary Fault is, as yet, turbine-free and, as was recommended by both Reporters at Abercairny and Logiealmond PLIs, should remain so.
2. The only justification for granting this application would be its contribution to national targets for the generation of electricity from renewable resources. The contribution of such a single turbine is at best speculative, since there is no firm wind data from the site. It is also based on an optimistic load factor of 27%, which is above official average statistics. The minimal contribution of such a turbine would be far less harmfully produced, were half a turbine introduced into an existing development, which has already created an environmental impact and has infrastructure in place. We do not agree with the developer's opinion at 5.18 that, in this case, "visual harm is outweighed by the application of renewable energy policy."
3. If this application were granted, it would open the door to further commercial development of this area of the transitional hills; this proposed turbine is 77 metres high and is not within the micro-generation category. It would also create a potential cumulative impact with the Mull Hill proposal to the west, which has yet to be decided.
4. In the accompanying statement the developer claims:

**Design and Access Statement
Proposed Wind Turbine
Drummick, Glenalmond**

3.30 In summary, the accompanying landscape report demonstrates that the proposed wind turbine can be successfully accommodated on site and assimilated into the surrounding area without causing significant harm to the local character, or landscape features of the area. There may be some significant effects upon residential visual amenity for some nearby properties. However, the proposed development comprises a single wind turbine and its effect upon the landscape character is judged to be slight / moderate.

We completely disagree with this facile conclusion. The proposed turbine is completely out-of-scale with the surrounding landscape and would

undoubtedly have a significant adverse impact on its nature and character. There would undoubtedly also be significant adverse effects on the residential amenity of nearby properties, on their visual amenity and in the realm of noise impacts. These noise impacts have not been satisfactorily addressed, in that an out of date system of assessment - ETSU 97 was employed. There is now also modern research, which raises issues of impact on sleep patterns and mental health of neighbouring residents. These are completely ignored in the statement. We do not agree with the developer's opinion at 5.18 that, in this case, "visual harm is outweighed by the application of renewable energy policy."

5. The section dealing with community benefit is not material to any planning decision – we are somewhat perplexed as to how the "community" would be defined.
6. The proposal would have a detrimental impact on the setting of Glenalmond College, sports fields and golf course. The college is a very famous and well-attended institution and, as such, merits much more consideration than it has received in the accompanying documentation.
7. The statement accompanying the application is obviously a desk-top study. It is very repetitive and constantly and consistently minimises the adverse impacts of the proposal. There is a wealth of irrelevant detail and very little that is site –specific. This also applies to the accompanying photomontages, most of which are taken from very far away and very few from relevant view-points. I have a 32 inch screen and I can hardly read the accompanying information. "


A Collision Risk Model was undertaken in relation to the proposed single turbine Project at Drummick and potential impacts upon target species.

Two models were run for directional flights (geese) and non-directional flights (raptors) through the CRW.

The first model predicted that one pink-footed goose would collide with the wind turbine every 25 years, representing 0.002% of the South Tayside Goose Roosts SPA population.

The second model predicted that with an avoidance rate of 98% (SNH 2010) one red kite would collide with the turbine every 27 years and one goshawk every 49 years.

The predicted lifespan of the proposed turbine is 25 years, therefore no birds are predicted to collide with the Drummick wind turbine based on this model.

 The model predicts that no sensitive raptor species will be killed over the lifespan of the proposed wind turbine and no impacts are anticipated on the South Tayside Goose Roosts SPA.

" The above excerpt illustrates the nonsense being quoted – it is quite illogical to assume that birds will avoid a turbine for 25 years and then fly through the empty space from year 26 onwards!

8.The proposal is contrary to planning policy at all levels –among others– Para 188 of SPP, Policy ER 14 of Perth & Kinross Structure Plan and Policy ER 6 of the Local Development Plan which is approaching completion.

The proposed development is out of scale and out of place in such a rural situation. It is quite conceivable, that were consent to be granted, a proliferation of similar applications, both on this site and neighbouring sites, would follow. We urge you to respect this unspoiled landscape as a valued recreational resource and as a valued area of Highland Perthshire, whose landscapes are its most important asset to its tourist industry. We respectfully therefore urge you to reject this application.

Maureen Beaumont.
(On behalf of the Sma' Glen Protection Group 2)

Mr Timothy Wright (Objects)

Comment submitted date: Fri 20 Apr 2012

Stroness House Glenalmond Perth PH1 3SF

TEL: 01738 880368

TO WHOM IT MAY CONCERN

20th April 2012

RE WIND TURBINE AT DRUMMICK, GLENALMOND, PERTH

Dear Sir

I wish to OBJECT to the proposed erection of an industrial sized wind turbine at the above location. Our house, where we live with our four children, directly overlooks the proposed and we have therefore some serious concerns ? not just about the single turbine but, given planning is being sort for an anemometer ? for the erection of many more in the future. There is no public benefit at all to this.

LOCATION

The proposed location is of major concern to us. Our vista and that of our neighbour is out onto the Sma Glen. There is currently a wood between us and the proposed turbine but we do not own this wood and should it come down then we would have direct site of the turbine. There is also the possibility of turbines being sited on any felled wood. It is a huge turbine (not a domestic one) and will be visible to us from the front of the house, the kitchen and bedrooms.

NOISE

There are four properties including ours in relative proximity to the proposed site and despite the fact here is only one proposed turbine nevertheless raises major concerns about noise pollution. There have been several well publicised cases recently of noise from turbines contributing to depressive conditions, including insomnia.

CONSTRUCTION

The access road to the proposed site is a very narrow country lane which is used by cars going to Glenalmond College as well as local residents. It is not at all suitable for construction traffic of the kind that will be required for the erection of this turbine. There are many blind bends on the road and it frequently gets icy. This is a significant issue.

RATIONALE

Why here in the middle of unspoilt grazing area where there is significant bird life? Most weekends there are bird watchers from the road and we will seek advice from Scottish Natural Heritage on the importance of this area for bird life. The RSPB have recently visited us to undertake a survey of birds in the area.

I sincerely hope that this application will be rejected.

Timothy and Michaela Wright and family

From: sally st john
Sent: 20 April 2012 11:57
To: Development Management - Generic Email Account
Subject: Application ref: 12/00401/FLL

Dear Sirs,

I wish to object to planning application 12/00401/FLL on the following grounds:

The siting of a 77 metre high wind turbine on Drummick will be a very prominent feature in an unspoilt rural setting, and will significantly alter the character of the landscape.

From Culnacloich we already see a line-up of turbines along the horizon in the Ochills. We look directly towards Drummick farm which sits prominently on a ridge and is widely visible from this northerly direction. The erection of a turbine at Drummick would constitute a cumulative visual impact, with a view of wind turbines on successive horizons. I urge the planners to consider the far-reaching visual impact of this single turbine, which is not adequately addressed in the application. I believe the detriment to the landscape of scenic beauty in close proximity to the Sma'Glen far outweighs the value in terms of carbon-saving of this single turbine, and I urge the planners to refuse this application.

It is not clear whether the picturesque Glenalmond College golf course will be adversely affected by this turbine. It is situated behind the Cairnies and is very close to Drummick, and is not marked on the plan. We already have one scenic local golf course under threat from a wind farm: the view from the Foulford golf course would be detrimentally affected if the Mull Hill application goes ahead. The setting of the Glenalmond college course is particularly beautiful, and has been enjoyed by local residents as well as generations of pupils, so it would be a considerable loss of amenity if it was affected.

Yours sincerely

Sally St. John
Culnacloich
Glenalmond
Perth
PH1 3SN

12/00401/FLL Erection of a wind turbine and anemometer mast on
Land 550 Metres South West Of Drumick Farm Glenalmond

Dear Sir – I wish to add my **objection** to those others lodged in relation to the proposal above. I have detailed planning permission for a new dwelling to be constructed within 1000m of the application site and within direct line of site of the proposed turbine.

I **object** to the proposal on visual grounds for the following reasons:

- The turbine will dominate the outlook from existing and approved residential properties close to the site, adversely affecting residential amenity;
- Emphasis is given in the submitted visual appraisal to the value of adjacent woodland as an effective screen. My understanding is that the adjacent copse is not in the ownership of the applicant and it is the land owners intention to crop this resource in the very near future;
- The scale and height of adjacent and nearby woodland is insufficient as a means of providing visual mitigation to a 50m hub and 77m high turbine;
- The presence of the pylons which cross the hills in this area are presented in the applicant's visual appraisal as receptors which will serve to diminish the scale of the proposed turbine. I would disagree with this conclusion and suggest that there would be no 'material' reduction in scale. The scale of proposed turbine (50m hub and 77m high turbine) is **significantly** larger and more assertive than the latticed pylons. The turbine would be more than **2.5x** the size of the pylons.
- The visualisations presented through the applicant's supporting statement are poor in their selection of viewpoints (viewpoints 11 in particular) and do not provide a balanced and objective representation of likely landscape impacts. In particular there is an absence of viewpoints from the A822 tourist route to the west; the Buchanty to Fowlis Wester site to the west; the Sma' Glen approach to the north west; and from the Igneous Hills landscape character type to the south.
- The proposal is poorly sited. From a number of vantage points significant lengths of the mast and the whole of the turbine blades would be visible against the sky with no intervening landscape screening;
- The application site lies immediately to the south of the Highland Boundary fault within the Lowland Hills Landscape Character type (Tayside Landscape Character Assessment). SNH advise a vulnerability to Tall Structures in this area because of the character of this landscape (small scale, historic, deeply rural,) and the likelihood that such structures could erode the important contribution of this landscape in the transition between lowland and highland;
- The scale of turbine proposed would be too large for this location and this landscape character type, would cause visual harm and would conflict with Structure and Local Plan Policies which seek to protect the character and appearance of the countryside, in particular SP Environment & Resources Policies 4 & 14 and Strathearn Area Local Plan Policies 1,2,3,5 & 11.
- The energy contribution of this single turbine and any benefits in reducing pollution would not outweigh the significant adverse effects on local environmental quality which would follow from the siting of a turbine of this scale in this location.

Charlotte Blackler
19 Station Road, Auchtermuchty
20 April 2012.

Foulford,
By Crieff.
PH7 3LN
5/9/12

Planning Ref: 12/00401/FLL – Local Review Body Appeal

Dear Sir,

In Reference to the above application and resulting appeal, I would re-iterate our opposition to the application especially in view of the proliferation of applications in Perthshire and beyond. Planning permission was refused in order to safeguard the visual amenity of residents and others – a very valid reason for refusal.

Another reason given was that the proposal would provide a dangerous precedent. In that regard, I would refer the Local Review Body to Para 2.2 of SNH's robust objection to the ongoing Mull Hill planning application and would respectfully submit that this statement is also valid for the proposal at Drummick:

“ 2.2 Landscape and visual impacts: advice

We consider that the location of the proposed wind farm would change the pattern set by existing wind farms in Perthshire. A consequence would be ‘infilling’ of a clear gap between ‘groups’ of other wind farms in the Ochil Hills to the south and the highland areas to the north. The consequent cumulative impacts, including sequential impacts, could be significant”

On behalf of East Strathearn Community Council and Sma' Glen Protection Group, I respectfully request that the Local Review Board uphold the previous decision and reject the application.

Yours faithfully,
Maureen Beaumont

CHX Planning Local Review Body - Generic Email Account

From: TIMOTHY WRIGHT [REDACTED]
Sent: 07 September 2012 08:40
To: CHX Planning Local Review Body - Generic Email Account
Subject: APPLICATION REF: 12/00401/FLL

Sir

Application Ref: 12/00401/FLL – Erection of a wind turbine and an anemometer mast on land 550 metres south west of Drumick Farm, Glenalmond – Clearwinds Limited

I am emailing in respect of the abobve appeal which you have notified me about.

As the covering letter from the applicant states 'no new supporting material has been specifically raised'. In addition there has been no further visits or communications to interested parties from either the applicant nor the author of this appeal that I am aware of.

I can only therefore reiterate the main comments that I and many others made in originally objecting to this proposal in May 2012.

VISUAL IMPACT

Clause 5.9 of the review document states 'the detailed visual analysis has demonstrated that the proposed turbine would be located at an appropriate distance to ensure the proposed turbine would not have an overbearing or overwhelming effect on the residential visual amenity of nearby properties (or their occupants).'

I would completely refute this. We live with our four children directly opposite the proposed site. There is a wood in front of us but this is not owned by us and the owner has intimated in writing that he plans to cut this down over the next few month. This will provide absolutely no screening at all for some distance around the site. The area, as was pointed out in the original rejection report, is enjoyed by a host of receptors including recreational users and residential properties amongst others. It is a completely unspoilt area, popular with birdwatchers, golfers on the Glenalmond Golf Course etc. and would be a significant eyesore which will be seen for a long distance away. In short I am not sure how the visual analysis described above has demonstrated anything.

LANDSCAPE IMPACT

The author of the review document (5.9) says that 'with the wind turbine in place it would not render these properties unattractive as places in which to live, when assessed objectively and in the public interest'. He then agrees in 5.6 that 'it is inevitable the wind turbine would have some effect on the landscape..'

Related to the above this is not a small, domestic turbine but a large commercial one. The hub has a height of 50 metres, a rotor diameter of 54 metres and a maximum blade tip height of approximately 77 metres. The turbine will be a three blade version, with a generating capacity of approx. 900kW. The scale therefore of the proposals and the sensitive location given we will be looking straight at it from the front of our house, will have a significant adverse impact on us and other houses in the vicinity. It will also, according to the original planning report on the first submission, have an impact on the Highland Boundary Fault. The turbine would be set in the foreground of the HBF, potentially diluting the significance of this important landscape feature by introducing a new, large scale man made feature into the landscape. The size of the turbine and blades will have a significant impact on

and the other properties in the vicinity will be similarly affected. We are also very concerned that approval for this will set a precedent for more and more similar schemes in the area. In short the proposed development contravenes many parts of the Strathearn Local development Plan 2011 and in particular the clause relating to development criteria and landscape

CONSTRUCTION ACCESS

The access road to the proposed site from the Sma' Glen to Buchanty is a very narrow country lane - image 3.11/2 on page 544. This lane and the road up to the proposed turning into the site access is used by cars going to Glenalmond College as well as by local residents travelling to Crieff and Aberfeldy. There are blind bends and in many places on the stretch to Buchanty there is only room for one car. During winter months it is frequently icy. It is certainly not at all suitable for construction traffic of any kind that will be required for the erection of this turbine.

There are issues cited in the original report rejecting this application which are covered in much more detail. Nothing, as the author admits, has materially changed since May when this was rejected. I would urge the review body to reject the appeal.

Yours Sincerely

Timothy and Michaela Wright
Stroness House
Glenalmond

Gillian Taylor, Clerk
Perth & Kinross Local Review Body
2 High Street
Perth
PH1 5PH

September 11 2012

Dear Gillian,

Re: Application 12/00401/FLL – Erection of wind turbine and anemometer mast on land 550m south-west of Drumick Farm, Glenalmond.

Thank you for your letter of the 30th August in relation to the above. I have since moved house (new address below) and your letter has only just caught up with me.

I am without internet connection at present so would welcome all further correspondence by Royal Mail to the address below.

I am pleased that my initial letter of objection will be copied and made available for Members of the Local Review Body and I thank you for the opportunity to make further comment. I would like to add the following additional points which I would be pleased if you could bring to the attention of the Members of the Local Review Body:

- **TAYplan** – whilst the TAYplan published in June 2012 has replaced the Perth & Kinross Structure Plan, importantly this document has not diluted either the commitment to the delivery of renewable energy proposals nor the need to balance such proposals with the other important sustainability objectives, namely that of environmental protection. The appellants suggest that Policy 6 only of the TAYplan is now relevant to the consideration of the appeal proposal (Energy and waste/resource management infrastructure). I would suggest that this is incorrect and that the other important environmental protection policies, namely *Shaping better quality places* (Policy 2); and *Managing TAYplan Assets* (Policy 3) are essential to the consideration of the appeal proposal. Importantly these new policies do not dilute the strong reasons put forward through the Officer Report of Handling but rather reinforce them;
- Quality of place and environmental protection is central to the vision and objectives of the TAYplan. The appeal proposal fails to properly take account of the sensitivity of the place, and in particular the likely impacts on the landscape character of the area immediately around the application site. As the Officer Report of Handling makes clear the

assessment of landscape impacts by Council Officer's (Planning Officer and Landscape Architect) has been informed by the report prepared for the Council by David Tyldsley Associates (*'Landscape Study to Inform Planning for Wind Energy, November 2010'*). That Report seeks to safeguard the distinctive landscape feature of the Highland Boundary Fault from the imposition of tall structures. The Report has been prepared by consultants independent of the Council who have a detailed knowledge of Perth and Kinross and the pressures for change having been involved for a number of years in the assessment of landscape and wind turbine proposals.

- Notwithstanding the fact that the landscape immediately around the application site is not 'protected' through any formal landscape designation, this does not mean that a landscape not designated has no value. This principle has been accepted by decision makers when considering other wind turbine proposals (namely DPEA Reporter Dan Jackman in dismissing the proposals to Standingfauld nr Auchterarder – PKC Ref: 09/02212/FLM).
- The area in the vicinity of the application site (Keillour and Gorthy woods) is an important and well used recreational resource from which public views of the application site, the Highland Boundary fault and the Sma'Glen are readily afforded. The visual impact of the proposal would be significant from public vantage points and this point has been made clear by the Community Council's of Methven & District and East Strathearn.
- I am very concerned that such a tall structure would have a dominant and overbearing impact when viewed from houses nearby affecting the residential amenities of occupiers of those properties to their severe detriment. The outlook from those properties closest to the structure would be dominated by the structure, rather than at present by the landscape, with no opportunity available for effective mitigation. This is apparent from any visit to the site.
- The appellants statement places a positive emphasis on the contribution this single turbine would make towards delivery of the ambitious targets for renewable energy developments set out in Scottish Planning Policy and of course the Council's own Planning Policies. Whilst the contribution is acknowledged it is not considered, in this instance, that this very limited contribution would outweigh the wider public amenity issues which are worthy of protection in this instance, namely protection of landscape and residential and recreational amenity.
- In my opinion this proposal would not secure the 'balanced' approach to the delivery of sustainable renewable economic development which is advocated by national Planning Guidance on this issue nor indeed Local Planning Policy.

Thank you for the opportunity to comment.

I look forward to the decision of the Local Review Body and would be pleased if the decision letter could be forwarded to me at my new address below.

Yours sincerely

Charlotte Blackler
'Glen Blackler'
Glenalmond
Perth
Ph1 3SF

